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# THE SENSITIVITY OF SMALL BUSINESSES TO INTEREST RATES: A CROSS-SECTIONAL VIEW

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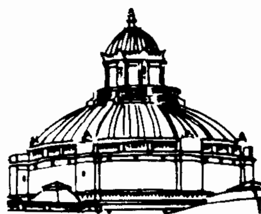

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ABSTRACT

High interest rates and the availability of credit are among the most important issues facing small businesses today. This study assembled various data and information which may prove useful in assessing the credit and capital needs of this large and diverse sector of the economy.

## ACKNOWLEDGMENT

Several persons in the Economics Division are deserving of thanks for their valuable consultations and comments during the development of this report. However, special thanks go to Dr. William Jackson for his help in identifying appropriate sources of information and data on interest rate movements and for his comments on money markets generally.

## CONTENTS

| | Page |
|---|---|
| ABSTRACT | iii |
| ACKNOWLEDGEMENT | v |
| SUMMARY | ix |
| I. INTRODUCTION | 1 |
| II. THE PRIME RATE AND SMALL BUSINESS LOANS | 5 |
| III. FINANCING OF SMALL BUSINESSES | 11 |
| A. The Scope of the Problem | 11 |
| B. Credit Availability | 12 |
| IV. SMALL BUSINESSES WITHIN U.S. INDUSTRIES | 15 |
| V. THE CAPITAL-LABOR ASPECTS OF SMALL BUSINESSES | 23 |
| VI. INTEREST RATES AND PRODUCTION LEVELS | 29 |
| VII. CONCLUDING OBSERVATIONS | 35 |
| APPENDIX: Congressional Publications on Small Business, Interest Rates and Credit, 96th and 97th Congresses | 39 |

## SUMMARY

This study assembled data and information which may prove useful in assessing the credit and capital needs of small businesses and their sensitivity to large and volatile changes in the cost of money. As a substitute for a complex definition of small business, this study concentrates on business entities employing fewer than 100 workers. After examining data on the number of establishments by employment size class in the many industries of the American economy, these industries were treated as either capital or labor intensive based on the number of dollars of invested capital per employee. When relations were made between the proportion of large (100 workers or more) business establishments in the various industries and capital invested per employee in these same industries, it was found that approximately 85 percent of all businesses employing fewer than 100 workers were in the five industries with the lowest capital invested per employee. This finding tends to support an intuitive conclusion that most small businesses rely more on labor than on capital inputs. Indications are that capital intensive industries depend more extensively on credit than labor intensive industries. Yet, the nature and structure of the industry of which businesses are a part to a large extent dictate their capital and credit needs. In the absence of specific data indicating capital or credit needs of small businesses, this study considered two aspects of industries to assess capital and credit requirements: (1) Structural needs--the role of capital and credit dictated by the nature and character of the industry in which the small business is located; and, (2) Product/Market effects--the role that interest rates and credit play in the post-production period and the impact that large changes in money rates have on such activity.

# THE SENSITIVITY OF SMALL BUSINESSES TO INTEREST RATES: A CROSS-SECTIONAL VIEW

## I. INTRODUCTION

According to the National Federation of Independent Business (NFIB) and the National Small Business Association (NSBA), high interest rates and the availability of credit are among the most important issues facing small businesses today. Business authorities generally agree that high interest rates along with high levels of inflation create financial strains and uncertainties throughout the business sector, regardless of business size. However, high interest rates, while impacting to some degree on all business establishments, 1/ impose a considerable cash flow burden on capital intensive small businesses and on those small concerns dependent on mortgage or retail consumer credit for the sale of their products or services. High interest rates can affect a business directly by adding to the cost of production, distribution and inventory accumulation. In turn, these increased costs contribute to raising the final price of goods and services. Because of potential upward pressure on product prices, high interest rates, especially for consumer credit, can also adversely affect a consumer's willingness to purchase products or services which, in turn, depresses demand and sales.

Although interest rates are generally recognized as an important economic factor, the effects of interest rates on "small business" are often assessed as if the small business community is a homogeneous group in which each segment

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1/ An establishment, according to the County Business Patterns, is a single physical location where business is conducted or where services or industrial operations are performed.

reacts to changes in the cost of money in roughly the same manner. According to the April 1980 report of the White House Commission on Small Business, "America's Small Business Economy: Agenda for Action," small businesses in the United States show considerable diversity across product and service lines and the number of small businesses accounts for a large percentage of all U.S. businesses. Consequently, an assessment of the impact of high interest rates on the component segments of the small business community, rather than on the community as a whole, can offer important insights into the relationship between money markets and small business activity, and can assist in the formulation of appropriate policies for addressing problems faced by those small establishments.

The impact of high interest rates on small businesses may differ depending on the nature of the industry in which the firm is engaged. Some small establishments may be relatively insensitive to high interest rates, while others in different industries may depend to a large extent on the behavior of interest rates for their growth and survival. For example, small financial establishments engaged in providing or supplying credit would tend to benefit from a general rise in interest rates but might also face high interest costs in their generation of deposits or funds. By contrast, when interest rates rise small businesses for which mortgage or consumer credit is essential for sustaining sales will generally experience some slack in demand while also increasing their own debt service costs.

Major factors recognized as impediments to a thorough analysis of the small business community's sensitivity to high interest rates include: (1) the lack of a single criterion for defining a small business, and (2) the lack of a comprehensive data base on the financial needs of small businesses.

In order to be designated a "small business" by the Small Business Administration (SBA), an establishment is assessed within the context of its industry.

Both volume of business transactions and number of workers employed are considered in relation to the relative size of these factors among business establishments in the same industry. According to one observer, the difficulty with defining or classifying businesses according to the dollar volume of total assets or number of workers is that such methods do not take into consideration the fact that "small" is a relative term and that industries differ widely with respect to the typical size of firm. 2/ Thus, for programmatic purposes, no single uniform size criterion exists for small businesses. Because different techniques are used to estimate the number of businesses by size in the U.S., three sources of information are frequently used. The first is the Internal Revenue Service (IRS) with its list of tax reporting business entities. The second is the Bureau of the Census' list of establishments by employment-size class. The third source of information is Dun and Bradstreet's Market Identifier File (DBMIF) credit ratings list. Of the three sources identified, the IRS list is the largest and DBMIF list is the smallest. For purposes of this study, and to facilitate this analysis, employee size of fewer than 100 is used heuristically as a general standard for small business.

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2/ Star, Alvin D. Estimates of the Number of Quasi and Small Businesses: 1948 to 1972. American Journal of Small Business. Vol. 4, No. 2, October 1979. p. 46.

## II. THE PRIME RATE AND SMALL BUSINESS LOANS

Interest rates are prices for borrowed money. The demand for borrowed funds represents desires of businesses, households, and government units to acquire credit to finance their expenditures and obligations. The supply of money available for borrowing depends largely on the amount of savings and newly created money flowing into financial markets. The interaction between demand for and the supply of money determines the level of interest rates. 3/

Reflecting the many purposes and situations that give rise to borrowing and lending, there is a wide variety of loans and investments in credit markets, each of which bears an interest rate. The different types of interest rates which are more likely to affect small businesses include those on: business loans, mortgages, and retail credit. While each of these markets generate their own interest rates, by and large they are indirectly influenced by the "prime rate."

Since 1978, the prime rate charged by banks to "low-risk business borrowers" has shown considerable volatility. During 1978, the prime rate averaged 9.1 percent and over the past two years increased steadily to an overall average of 15.3 percent during 1980, reaching a high of slightly over 20 percent in early 1981.

For the year 1981 as a whole, the average prime rate fell to 18.9 percent. However, this rate of decline was not steady. The prime rate showed considerable month-to-month fluctuations during 1981. At the start of the year, a record high rate of 21.5 percent was recorded. Following that peak the prime rate declined steadily through the month of April when it averaged 17.2 percent.

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3/ U.S. Library of Congress. Congressional Research Service. High Interest Rates: Causes and Effects. Typed Report, by Carol Leisenring. June 30, 1980. Washington, 1980. p. 1.

The next surge began during May 1981 when the prime rate again rose above 20 percent and continued fluctuating about that level through September of that year. During the last quarter of 1981, the prime rate declined steadily with averages for the months of October, November, and December of 18.5, 16.9, and 15.8 percent, respectively.

Generally, movements in other interest rates are associated with those of the prime rate. However, not all interest rates fluctuate to the same extent as the prime rate. Long-term rates, in typical fashion, have shown less volatility. For example, the corporate Aaa bond rate (representing some very creditworthy businesses' financing costs for long-term debt) ranged from 12.6 percent to 15.8 percent in 1981, much less than the prime, ending the year about one percentage point above its level in the previous December 1980.

The volatility of the prime rate has important implications for most small business establishments because of their extensive reliance on debt financing. Unlike the large corporation sector of the economy, most small establishments have few, if any, internal sources of funds; consequently, they rely primarily on local commercial banks for short- or intermediate-term credit. Typically, many small business loan contracts carry interest rates several percentage points above the prime rate. Thus, both the level and the uncertainty of their borrowing costs adversely affect many small businesses. This uncertainty is particularly great for mortgage lenders who must lend over the long term (generally 30 years) but who must borrow in a short-term market with large interest rate fluctuations.

On the other hand, small businesses have benefitted from a two-tier prime lending rate--that is, a prime rate differential that is lower for small than for large businesses. A two-tier prime rate was first used in 1973-1975 as a

Federal Reserve device for rationing credit extensions by commercial banks. 4/ The stated purpose of the two-tier prime lending rate was "to afford small business borrowers protection against burdensome increases in interest rates..." It was not intended, however, "to interfere with normal banking business practices...that reflect credit risk and similar factors." 5/ The two-tier prime rate was again implemented in 1978 by some commercial banks on a voluntary basis to assist small business borrowers. Unlike the earlier 1973-1975 rationing of credit extensions, recent bank lending practices reportedly indicate that "the loan interest rate charged to any particular market segment is a function of a complex array of factors including competitive considerations, risk, and importantly, the demand for credit and the costs associated with the source of money used to support those credits." 6/

While the prime rate applies specifically to commercial and industrial loans, nevertheless it has an indirect effect on other lending activity. For example, during periods of high interest rates, local mortgage lenders are less

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4/ The Federal Reserve has important effects on interest rates and on the availability of money to borrowers. While the Federal Reserve does not have the power to set interest rates in general, it controls the Federal Reserve discount rate; and, changes in the discount rate can influence other market rates. Additionally, the Federal Reserve has the power to change reserve requirements, that is, the percentage of deposits member banks must keep on reserve. When reserve requirements are increased, banks are required to keep more reserves, thus reducing the amount of money available to lend. By altering availability of money and credit, interest rates may be affected.

5/ U.S. Library of Congress. Congressional Research Service. Government Credit Controls and the Dual Prime Rate as Related to Small Business, 1969 to Date. Typed Report, by William Jackson, March 11, 1980. Washington, 1980. p. 3, 12.

6/ U.S. Congress. House. Committee on Banking, Finance and Urban Affairs. An Analysis of Prime Rate Lending Practices at the Ten Largest United States Banks. Committee Print No. 2, 97th Cong., 1st sess., April 1981. Washington, U.S. Govt. Print. Off., 1981. p. 100.

likely to enter into new loan contracts. Instead, savers in lending institutions are encouraged to place their funds in unregulated financial markets, such as money market funds and corporate obligations paying interest rates higher than depository financial institutions may be allowed to pay under regulation. As financial flows are diverted from them, mortgage-lending institutions cut back on their mortgage commitments. 7/

Consumer lending rates, although less volatile than business loan rates, are also influenced by movements in the prime rate. These changes in consumer lending rates have a significant effect on the cost and availability of credit to consumers. 8/ Additionally, during periods of reduced cash flow, commercial banks tend to alter preferences for lending in favor of large businesses and at the expense of small businesses. 9/ Such practices are commonly discussed within the context of price discrimination. Several studies have examined the effects of similar practices that occurred during the 1955-57 period. These studies "demonstrated that credit rationing exists and that it is a rational response by commercial banks to changes in economic conditions." 10/ During these periods of "credit stringency," lenders frequently tighten loan eligi-

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7/ U.S. Library of Congress. Congressional Research Service. Financial Deregulation: Relaxing Ceilings on Deposit Interest Rates, 1978-1980. Report No. 81-176 E, by William Jackson. Washington, 1981. p. 5.

8/ Owners of small businesses often finance their operations by obtaining consumer credit or mortgage financing in their names and against their own assets and incomes, since the businesses may not be considered creditworthy. This situation provides another channel for tight money to adversely affect small businesses.

9/ U.S. Congress. House. Committee on Small Business. Federal Monetary Policy and Its Effect on Small Business. Report No. 1435, 96th Cong., 2d sess., September 1980. Washington, U.S. Govt. Print. Off., 1980. p. 17. (Hereafter cited as Federal Monetary Policy.)

10/ Federal Monetary Policy, p. 17.

bility requirements. Some of these changes may not necessarily relate to price, risk, or ability to repay. The Interagency Task Force on Small Business Finance recently observed in its final report to the Congress that: "In periods of tight money, the 'fringe of unsatisfied demand' is enlarged and the burden of adjustment is borne unduly by the relatively high risk borrower, i.e., small business, in large part." 11/

Some obvious examples of small business activity in which interest rate movements play an important role can highlight the differences among businesses in interest rate sensitivities. Single-family dwelling construction, engaged in mostly by small contractors and subcontractors, is significantly affected by construction loans and home mortgage rates. High-cost construction loans could result in depressed sales potential for the builder's product, since its price would have to reflect the higher financing charges faced by the builder. In turn, high mortgage rates applied to larger mortgages can have a serious chilling effect on the sale of homes.

High interest rates that affect consumer or retail credit are of major concern to many retailers, such as auto dealerships, sellers of home appliances, furniture, and communications products as well as to many other retail and service establishments (clothing, auto repair, etc.). Such concern is based on the frequent use of credit card purchases and other similar consumer financing methods for these goods and services. Auto dealerships, for example, experience declines in total sales during continuous periods of high interest rates for auto financing which add further to already high sticker prices. These increased cost burdens not only discourage car sales but also increase the cost to dealers of maintaining growing inventories.

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11/ Greenbaum, Stuart I., George Kanatas, and Sudhakar D. Deshmukh. Credit Rationing and Small Business Finance. The Interagency Task Force on Small Businesses Finance, Washington, February 1982. p. 1.

Other types of small businesses may not be as adversely affected by high interest rates. For example, a small service-oriented business in which little capital investment is required and inventory stockpiling is minimal, may not face the problems of a high-cost money market beyond that incurred in occasionally meeting basic fixed costs and payroll requirements during periods of insufficient cash flow.

Given the premise that not all small businesses are affected in the same manner by interest rates, this study will: (a) examine industries with a large proportion of small businesses; (b) identify small business-dominated industries which are sensitive to large and volatile changes in the cost of money; and (c) assess the degree of impact high interest rates have on small business loans.

## III. FINANCING OF SMALL BUSINESSES

### A. The Scope of the Problem

According to a recent report submitted to the Congress in February 1982 by the Interagency Task Force on Small Business Finance, small businesses' ability to obtain needed financing, particularly during periods of high interest rates or reduced credit availability, has been severely strained by a number of market factors. This issue has received considerable attention in congressional hearings and reports and in money markets, as well as among small business groups across the country. Such concern may be attributed, in part, to the recognition that small businesses account for a high proportion of U.S. industries, show considerable diversity in all areas of the economy, and are a principal source of employment and technological innovation. Moreover, numerous studies on small business financing make the claim that smaller firms' reliance on debt financing is more pronounced than that of larger businesses. 12/ Considering the pervasiveness of small businesses among all U.S. industries, any obstacles to adequate financing for this large and diversified segment of the American business community can become a serious national problem.

Such obstacles appear to be serious at this time. In testimony before House committee hearings on interest rates and credit availability, a spokesman from the American Bankers Association stated that "the impact of inflation on the ability of banks to meet the credit needs of their business communities is magnified by the imposition of unrealistic deposit rate ceilings." 13/ He

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12/ Glassman, Cynthia A. and Peter L. Struck. Survey of Commercial Bank Lending to Small Business. The Interagency Task Force on Small Business Finance, Washington, February 1982. p. 1.

13/ U.S. Congress. House. Committee on Agriculture. Subcommittee on Conservation, Credit, and Rural Development. Interest Rates and Credit Availability. Hearings, 97th Cong., 1st sess., June 23, 1981. Washington, U.S. Govt. Print. Off., 1981. p. 148.

further stated that depository institutions are designed to serve the credit needs of their local communities, and historically have done so "efficiently and responsibly." However, he added, if depository institutions are unable to attract deposit funds it would be almost impossible to meet the credit needs of growing small businesses, home construction developments, or mortgages. 14/

B. Credit Availability

Traditionally, commercial banks have been the largest single most important suppliers of funds to small businesses. Data from the Interagency Task Force on Small Business Finance's business-loan survey indicate that small business lending accounts for an estimated one-third of the dollar amount, and over 80 percent of the number of all bank business loans. 15/ Among the various types of financing available to small businesses are short-term credit, term credit (long or intermediate), equity capital, trade credit, and leasing.

The Interagency Task Force data on small business financing suggest that financing facilities are reasonably adequate for short- and intermediate-term borrowing but that as the term for which financing is desired lengthens, financial facilities become less adequate. Moreover, analysts note that the flexibility provided small businesses by the variety of credit sources serve to minimize the effect of credit restrictions on any one borrowing source. 16/ While this may be true for the small business community as a whole, there is

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14/ Ibid., p. 150.

15/ Andrews, Victor L. and Peter C. Eisemann. Who Finances Small Business Circa 1980? Interagency Task Force on Small Business Finance. Washingtc

reportedly a substantial number of small concerns experiencing limited borrowing opportunities. 17/

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17/ Federal Monetary Policy, p. 14.

## IV. SMALL BUSINESSES WITHIN U.S. INDUSTRIES

This section provides background as to the extent of small business concentration within U.S. industries. It analyzes the distribution of small businesses among major industrial groupings.

The scope and importance of small business activity within the economy has yet to be substantively measured with any degree of detail or precision. Small businesses, nevertheless, are noted for providing opportunites for new employment, entrepreneurial activity, enterprise, innovation, and achievement. Small businesses show considerable diversity across product and service lines in the economy. For the most part, they are spread among all sectors of the economy including construction, manufacturing, mining, wholesale and retail trade, professional and nonprofessional services, transportation, agriculture, and financial services. However, the degree of concentration in each industrial classification varies.

Table 1 (p. 21, below) provides Census Bureau data by major industry categories for employment size groupings within the range of 1 to 99 workers for 1979 (the latest year for which data are available). These data indicate that there were more than 4.5 million business establishments of all employment-size in the U.S. during 1979. Employment-size data also show that of these 4.5 million separate establishments, employers with fewer than 5 workers accounted for 54.3 percent (see Chart 1, p. 17); 86.6 percent had fewer than 20 (see Chart 2, p. 27); 94.9 percent employed fewer than 50 workers; and 99 or fewer employees accounted for 97.7 percent of all establishments.

An examination of the units classified by employment-size groupings in each major industry gives some insight as to the degree to which establishments with few employees exist in each of the several industries of the U.S. economy.

These data also show the many variations of small establishments by noting the extent to which they exist among specific industrial classifications.

In 1979, the service industry accounted for more than 1.2 million establishments, covering a wide range of employment sizes. It comprised about one-fourth of all U.S. establishments. 18/ (See Table 1, p. 21.) Among these were beauty shops, repair shops, laundry and dry cleaning establishments, maintenance services, funeral parlors and many similar type of service units. The service sector is generally recognized as the industry providing the widest gateway to the world of business for small enterprises with very limited capital. According to the 1979 data, the largest portion of the 1.2 million service industry's total units (60.7 percent) was represented by establishments employing fewer than 5 persons. Of these 1.2 million units, 96.1 percent employed fewer than 50 workers and 98.2 percent had fewer than 100 employees. Thus, only 1.8 percent of the 1.2 million units in the service industry employed 100 workers or more.

Retail trade, which comprises department and variety stores, automotive dealerships, service stations, and food stores, has a lower proportion of very small establishments, with slightly less than one-half (48.3 percent) of the 1.24 million establishments in the industry employing fewer than 5 workers. Retail trade establishments with fewer than 100 employees, however, represented 98.8 percent of the total establishments in the industry.

Like retail trade, a large percentage of businesses engaged in wholesale trade are small employment establishments. More than 42 percent of the these 382,872 firms consisted of 4 or fewer employees. Wholesale houses with 99 or fewer persons made up about 98.6 percent of all such establishments, while the remaining 1.3 percent had workforces of 100 or more.

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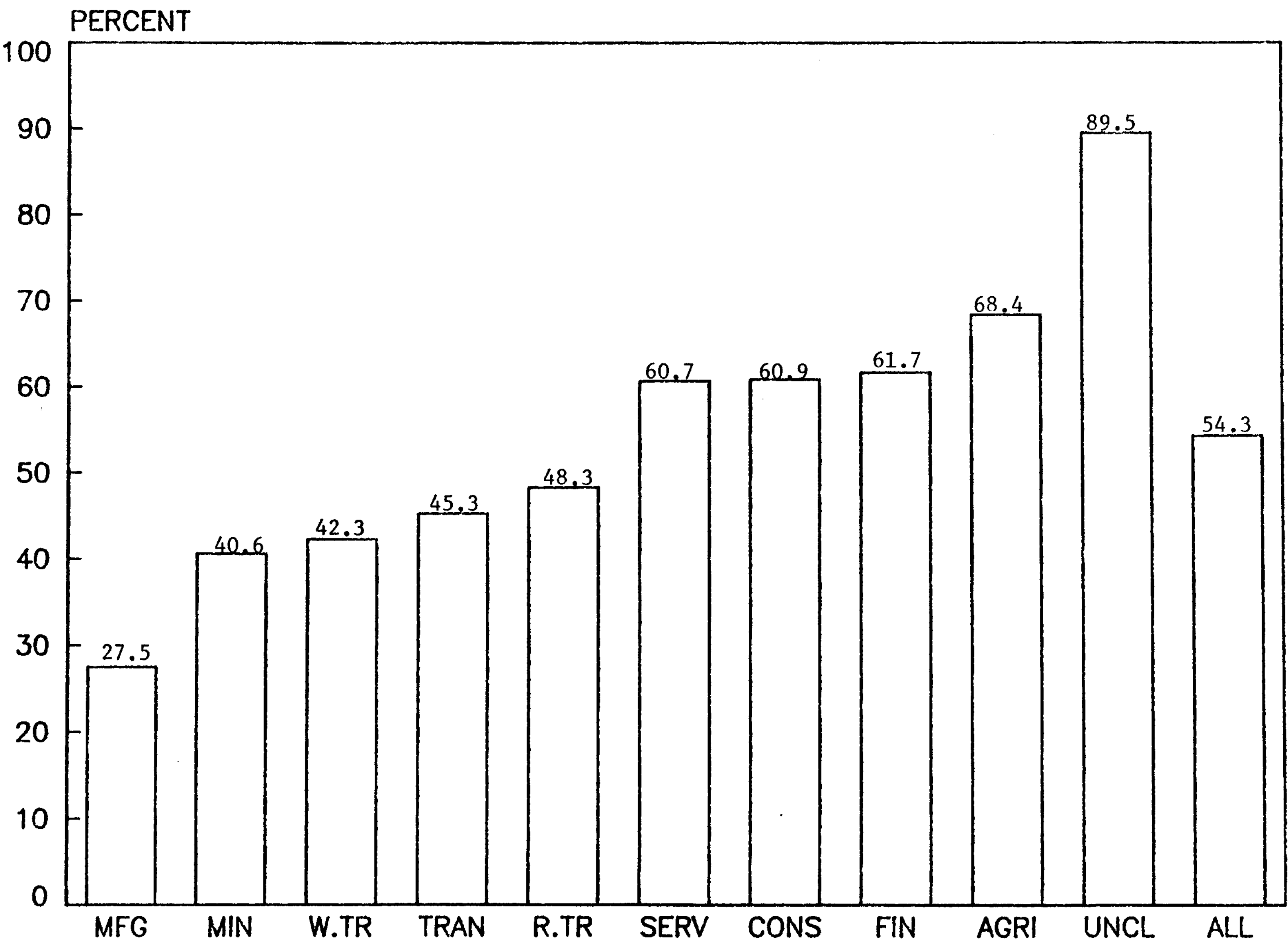
18/ U.S. Library of Congress. Congressional Research Service. The Service Sector in the American Economy Today: An Overview. Report by Julius Allen and Mark Jickling. December 28, 1981. Washington, 62 p.

CHART 1: PERCENT OF ESTABLISHMENTS WITH FEWER THAN 5 WORKERS, BY INDUSTRY, 1979.




Source: U.S. Department of Commerce, Bureau of the Census. The abbreviations refer to the industries appearing in Table 1 on page 21.

The production sectors of the economy--manufacturing, construction, and mining--have more of their units incorporated, and generally require more complete accounting and operating records. Using a dividing line of 100 employees between small and large employment establishments, Table 1 shows that about 87.4 percent of all businesses engaged in manufacturing are small employers. However, in durable and nondurable manufacturing, more than 43 percent of all establishments employed 10 or more workers and 43.6 percent had fewer than 10 workers. In addition, in the manufacturing sector, approximately 12.5 percent of the 320,605 units (40,075) were in employment-size classes of 100 workers or more. This share of units represented the highest proportion of larger employment units of all industries.

The data suggest that in contract construction, most establishments (60.9 percent of 447,273 establishments) are very small employment units of 1 to 4 workers. This large number of small units tend to support the observation that construction is by and large a highly atomistic industry, with specific craftsmen (e.g., plumbers, bricklayers, steelworkers, carpenters, etc.) working, for the most part, as sub-contractors to other low-employment prime contracting establishments. In this industry, less than 1 percent (4,920) of all the establishments have 100 or more employees on their payrolls. While there are large construction businesses engaged in the building of whole communities or large single-family home subdivisions, most small businesses are engaged in construction work on one- and two-family houses, as opposed to larger businesses carrying on construction work on apartment houses, commercial and industrial developments, or on heavy construction (e.g., roads, bridges, dams).

The excavation of coal, fluid fuels, metallic ores, stone, and other metal- and mineral-type products are included in the industry classification

of mining. In 1979, there were 27,878 individual businesses engaged in mining. Although many mining operations are small establishments, the industry is nevertheless not regarded as a fertile field for newcomers. In the extractive industry, a relatively high proportion of raw materials is not available in the United States and the high import cost makes entry into the industry difficult. In addition, many products are either uneconomical or inaccessible for exploitation, and require large capital investment. 19/ The 1979 data show that 40 percent of the 27,878 mining businesses had 4 or fewer employees, and 87 percent had fewer than 50 employees. This industry, although only 6.7 percent of all establishments employed 100 or more employees, had a relatively high proportion of large establishments.

In finance, insurance, and real estate, a substantial portion of business volume is in the hands of a few large institutions associated with the individual sub-industries. However, the number of small establishments in the overall industry is quite large. The finance, insurance, and real estate industry as a whole may be closely ranked in importance with the service industry group. In 1979, for example 424,805 establishments were accounted for, of which 262,241, or 61.7 percent, employed fewer than 5 persons and 89.5 percent had fewer than 20 workers. Only 9,130 establishments, or 2.1 percent, employed 50 to 99 persons and 1.4 percent employed 100 or more workers.

Transportation and other public utilities is another industry group which covers a wide range of activity. It includes taxicab operators, airline, rail and bus operators, and large electric and gas utility services. Of the estimated 168,062 separate establishments, 95 percent employed fewer than 100

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19/ U.S. Department of Commerce. Bureau of Industrial Economics. U.S. Industrial Outlook for 200 Industries with Projections for 1985. Washington, January 1981. p. 186.

persons and 45 percent employed fewer than 5. Here too, fewer than 5 percent of the establishments had employment sizes of 100 or more, although this is a greater proportion than in most other industries.

Forestry, landscape and horticultural, veterinary, fishing, hunting, and trapping services are included in the agricultural services, forestry, and fisheries industry group. In 1979, 68 percent of the estimated 45,880 separate establishments employed 4 persons or fewer. Another 31 percent employed 5 to 99 persons, and the remaining sites, representing less than one percent, employed 100 or more persons.

Nonclassifiable establishments, totaling 219,736 for the year 1979, were largely concentrated in the 1 to 49 employment-size units. Table 1 shows that 99.2 percent of the 219,736 businesses consisted of fewer than 20 workers, while the remainder (less than 1 percent) had a workforce of 20 or more. Because this sector of establishments was not specifically identified or defined by the Department of Commerce within the several standard industrial classification categories, nonclassifiable establishments are included in the data but not included in the analysis.

In summary, Table 1 shows that small employment concerns are dispersed across all industries of the U.S. economy but in differing degrees. However, indications are that small concerns represent a larger percent of all establishments in (1) agricultural services, forestry, and fisheries; (2) finance, insurance, and real estate; (3) contract construction; and (4) services. These are followed by retail and wholesale trade, transportation, and mining. On the other hand, manufacturing appears to be the sector with the greatest proportion of relatively larger companies (12.5 percent employing 100 or more workers) followed by transportation and other public utilities and then by mining.

TABLE 1. PROPORTION OF SMALL BUSINESSES WITHIN U.S. INDUSTRIES, BY NUMBER OF EMPLOYEES, 1979

Number of Establishments by Employment-Size Class Units

| Major Industry Group | Total | 1 to 4 | | 5 to 9 | | 10 to 19 | | 20 to 49 | | 50 to 99 | | 100 or More |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | # | % | # | % | # | % | % |
| Total Number of Establishments | 4,535,653 | 2,464,864 | 54.3 | 895,744 | 19.7 | 568,501 | 12.5 | 375,656 | 8.3 | 129,255 | 2.9 | 2.2 |
| Services | 1,261,955 | 766,630 | 60.7 | 243,892 | 19.3 | 130,375 | 10.3 | 72,675 | 5.8 | 26,000 | 2.1 | 1.8 |
| Retail Trade | 1,236,587 | 597,815 | 48.3 | 293,017 | 23.7 | 180,761 | 14.6 | 115,989 | 9.4 | 35,205 | 2.8 | 1.1 |
| Contract Construction | 447,273 | 272,498 | 60.9 | 83,569 | 18.7 | 50,012 | 11.1 | 28,761 | 6.4 | 7,977 | 1.8 | .9 |
| Finance, Insurance and Real Estate | 424,805 | 262,241 | 61.7 | 73,905 | 17.4 | 44,029 | 10.4 | 29,488 | 6.9 | 9,130 | 2.1 | 1.4 |
| Wholesale Trade | 382,872 | 162,052 | 42.3 | 90,822 | 23.7 | 69,703 | 18.2 | 43,997 | 11.5 | 11,141 | 2.9 | 1.3 |
| Manufacturing (Durables and non-durables) | 320,605 | 88,009 | 27.5 | 51,497 | 16.1 | 54,148 | 16.9 | 57,225 | 17.8 | 29,491 | 9.2 | 12.5 |
| Transportation and other Public Utilities | 168,062 | 76,159 | 45.3 | 30,534 | 18.2 | 25,001 | 14.9 | 20,495 | 12.2 | 8,347 | 5.0 | 4.4 |
| \gricultural Services, Forestry, Fisheries | 45,880 | 31,391 | 68.4 | 8,489 | 18.5 | 4,021 | 8.8 | 1,471 | 3.2 | 316 | 0.7 | .4 |
| ining | 27,878 | 11,322 | 40.6 | 4,524 | 16.2 | 4,381 | 15.7 | 4,135 | 14.8 | 1,644 | 5.9 | 6.7 |
| onclassifiable establishments | 219,736 | 196,747 | 89.5 | 15,495 | 7.0 | 6,070 | 2.7 | 1,420 | 0.6 | 4 | .001 | (00) |

1/ "Establishment" data used in this table were taken from the County Business Patterns of 1979. n establishment, according to the County Business Patterns, is a single physical location where business is conducted or where services or industrial operations are performed. Establishment size esignations are measured by paid employment.

Source: U.S. Department of Commerce, Bureau of the Census.

## V. THE CAPITAL-LABOR ASPECTS OF SMALL BUSINESSES

In an effort to assess the relative sensitivity of groups of small businesses to interest rate changes, the capital-labor ratio of industries were first examined. These data, measured in thousands of 1972 dollars invested per employee for whole industries, were then related with the proportion of small businesses within the U.S. industries. The latter factor was measured by using the complement of the percentage of establishments with fewer than 100 employees each. That is, the extent to which large establishments (with 100 or more employees) exist within the various industries was related with the capital invested per employee (in 1976) for these same industries. (See Table No. 2, p. 24-25.)

As Table No. 2 shows, five U.S. industries have relatively few establishments employing 100 or more employees and are therefore more densely populated with small businesses. These are: (1) services, (2) retail trade and wholesale trade, (3) contract construction, (4) finance, insurance, and real estate, and (5) agricultural services, forestry, and fisheries. Of these five industries, although one (services) has the highest number of large establishments, only 1.8 percent of all its establishments employ 100 or more workers. In contract construction, only 0.9 percent of the establishments employ more than 100 employees. And, agricultural services, with 0.4 percent, has the smallest proportion of large establishments. (See Chart 2.)

When these five industries, each of which has relatively few large establishments, are examined for capital invested per employee, it becomes clear that their capital needs are comparatively low, ranging from $11,700 per employee in contract construction, to $22,800 per employee in services. (See Table No. 2.)

Table No. 2: Capital Invested Per Employee by Industry Classification, 1976

I. LABOR INTENSIVE

| Industry | % of Establishments with 100 Employees or More | Capital Invested Per Employee by Industry (in thousands of 1972 dollars) |
|---|---|---|
| Services | 1.8 | $ 22.8 |
| Retail trade | 1.1 | 14.6 |
| Wholesale trade | 1.3 | 14.6 |
| Contract construction | .9 | 11.7 |
| Finance, insurance (and real estate) | 1.4 | 20.1 1/ |
| Agricultural services, forestry, and fisheries | .4 | (n/a) |

II. CAPITAL INTENSIVE

| Industry | % of Establishments with 100 Employees or More | Capital Invested Per Employee by Industry (in thousands of 1972 dollars) |
|---|---|---|
| Transportation and public utilities | 4.4 | 102.8 Trans<br>367.6 Pub. Util. |
| Mining | 6.7 | 59.1 |

III. LABOR OR CAPITAL INTENSIVE

| Industry | % of Establishments with 100 Employees or More | Capital Invested Per Employee by Industry (in thousands of 1972 dollars) |
|---|---|---|
| Manufacturing | 12. 5 | |
| More than $25,000/employee | | High |
| Petroleum refining | | $ 150.9 |
| Primary metals | | 65.6 |
| Tobacco products | | 58.7 |
| Chemicals | | 55.1 |
| Paper | | 46.3 |
| Stone, clay, glass | | 36.4 |
| Transportation equipment | | 27.2 |
| Nonelectrical machinery | | 26.5 |

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1/ The value of real estate was omitted from the capital invested per employee total since it appears to skew the data unnecessarily and thus, this figure represents capital invested per employee for the finance and insurance industry only.

Table No. 2: Capital Invested Per Employee by Industry Classification, 1976

III. LABOR OR CAPITAL INTENSIVE (cont.)

| Industry | % of Establishments with 100 Employees or More | Capital Invested Per Employee by Industry (in thousands of 1972 dollars) |
|---|---|---|
| Manufacturing | | |
| More than $10,000 to $25,000/employee | | Medium |
| Fabricated metals | | $ 21.6 |
| Rubber and plastics | | 20.9 |
| Lumber and wood | | 20.0 |
| Instruments | | 19.4 |
| Textiles | | 18.6 |
| Electrical machinery | | 18.1 |
| Miscellaneous manufacturing | | 15.7 |
| $10,000 or less/employee | | Low |
| Furniture and fixtures | | 10.0 |
| Leather | | 7.1 |
| Apparel | | 6.1 |

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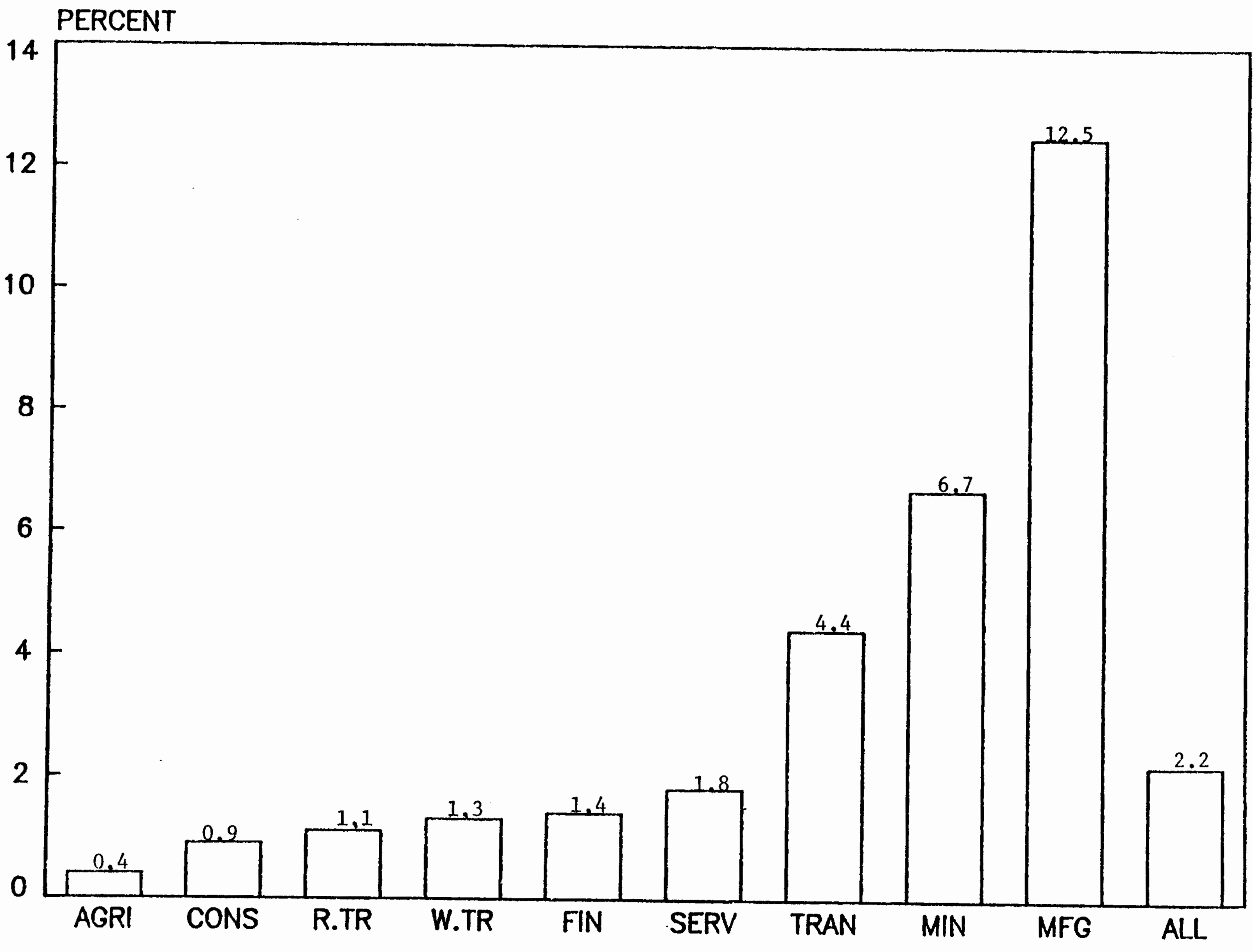
Sources: (1) For data on establishments with more than 100 employees, County Business Patterns, Bureau of Census, U.S. Department of Commerce as contained in Table #1B, page 24 of this report.
(2) For data on Capital Invested Per Employee, Table #939, page 561, Statistical Abstract of U.S., 1980 (The Conference Board, NYC, NY, Road Maps of Industry, 1976).

On the other hand, (1) transportation, (2) public utilities, (3) mining, and (4) manufacturing each have relatively high proportions of establishments employing 100 workers or more, ranging from 4.4 percent for transportation and public utilities combined, to 12.5 percent for manufacturing. Interestingly, and probably not by coincidence, transportation, public utilities, and mining also have large amounts of capital invested per employee ($367,000 in public utilities, $102,000 in transportation, and $59,000 in mining). Manufacturing, which as a whole contains the largest proportion of establishments employing 100 or more workers (12.5 percent), varies significantly by manufacturing industries in the amount of capital invested per employee. As indicated in Table No. 2, the amount of invested capital per employee in the industrial classifications of manufacturing range from a low of $6,100 for apparel, to $150,900 for petroleum refining. Using the ranges existing in the other capital intensive industries (transportation, public utilities, and mining), and in the labor intensive group (services, retail and wholesale trade, contract construction, and finance and insurance), the industrial categories under manufacturing can be arranged into three groups: high, medium, and low capital-labor ratio groups.

Those manufacturing industries in the manufacturing high capital-labor group each invest more dollars per worker than any of the industries in the labor intensive industries. Those in the medium manufacturing group overlap the range of the labor intensive industries. And, those in the low group are more labor intensive than any other manufacturing group, as well as the five labor intensive industries with a high proportion of small businesses.

According to available industry data on establishments by employment-size units and on capital invested per employee in various industries, this analysis suggests that: (1) in the five labor-intensive industries which together comprise over 85 percent of all small business establishments in the United States,




Source: U.S. Department of Commerce, Bureau of the Census. The abbreviations refer to the industries appearing in Table 1 on page 21.

capital invested per employee is relatively low; (2) in transportation, public utilities, and mining, where a larger proportion of large business establishments exist, capital invested per employee is high; and (3) in manufacturing overall, with the highest proportion of larger establishments, capital investment per employee can be either high, medium or low depending on the manufacturing industry.

## VI. INTEREST RATES AND PRODUCTION LEVELS

In order to assess the extent of the relation between interest rate changes and changes in production levels of broad industrial classifications, year-to-year percent changes in annual gross domestic product values 20/ for each industry were plotted for the years 1972 to 1981. The production values used for this analysis were in constant 1972 dollars in order to eliminate the effects of inflation on data measuring annual levels of production. These changes in production levels for each industry, except construction, were then matched with the annual average prime interest rate prevailing in each year 1972-1981. For construction, changes in values of gross domestic product were matched with the effective yield rates on conventional mortgages for new homes. 21/

This analysis was conducted under a reasonable assumption that production levels, although affected by several economic variables, generally reflect the product demand that is perceived to exist by producers in their markets. To the extent that interest rates (among other factors) depress demand, then production levels would be cut back. 22/

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20/ U.S. Congress. House. Committee on Banking, Finance, and Urban Affairs. A Reference Guide to Banking and Finance. Committee Print, 97th Congress, 1st Sess. Washington, U.S. Govt. Print. Off., 1981. p. 22.

[Gross Domestic Product (GDP) is the same as Gross National Product (GNP) except that GNP includes (and GDP) excludes) as part of each country's output the net income earned abroad (wages, interest, rent and profits) by the home country's factors of production (land, labor and capital). Stated another way, GDP measures output produced within the home country regardless of the residency of its factors of production, while GNP measures output produced by the home country's factors of production regardless of where the production activity takes place.]

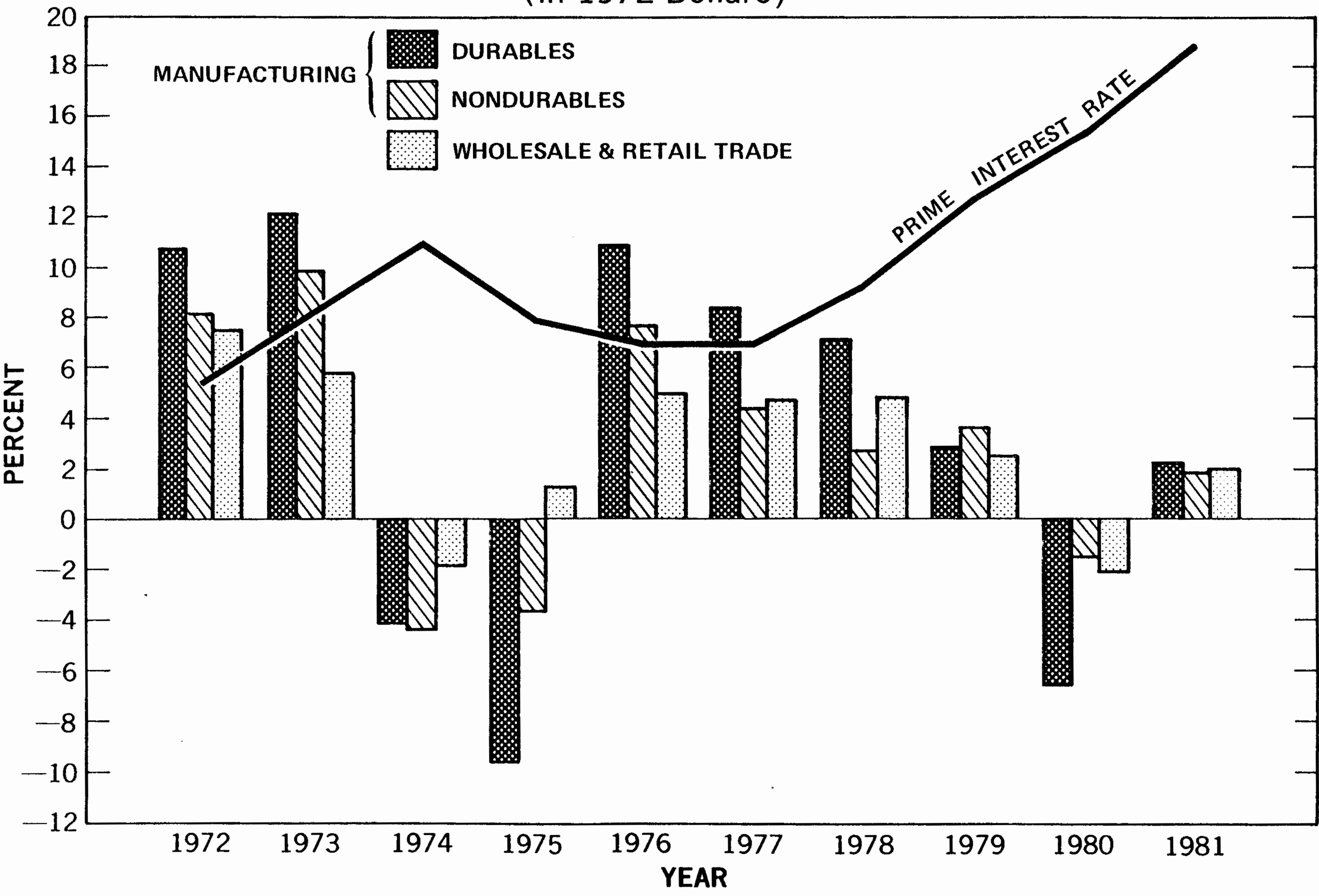
21/ U.S. Library of Congress. Congressional Research Service. Housing and the Economy. Issue Brief No. IB78086, by Barbara Miles and Bruce, Sept. 9, 1978 (continually updated). Washington, 1978. 17 p.

22/ U.S. Library of Congress. Congressional Research Service. Recession in the United States: Economic Effects and Policy Implications. Report by the Economics Division. July 30, 1980. Washington, 268 p.

The several graphic displays in the following portion of this Report show that for (a) construction, (b) manufacturing (durables and nondurables), (c) retail and wholesale trade, and for (d) finance, insurance, and real estate, production changes appear to be more closely correlated with interest rate movements than they are for (e) mining, (f) agricultural, fisheries, and forestry, (g) services, and (h) transportation and public utilities. Matching these findings with the findings of the previous sections which measured small business concentration among different industries and those with high or low levels of capital invested per employee, helped to identify those segments of the small business community that are more sensitive to interest rate changes than others.

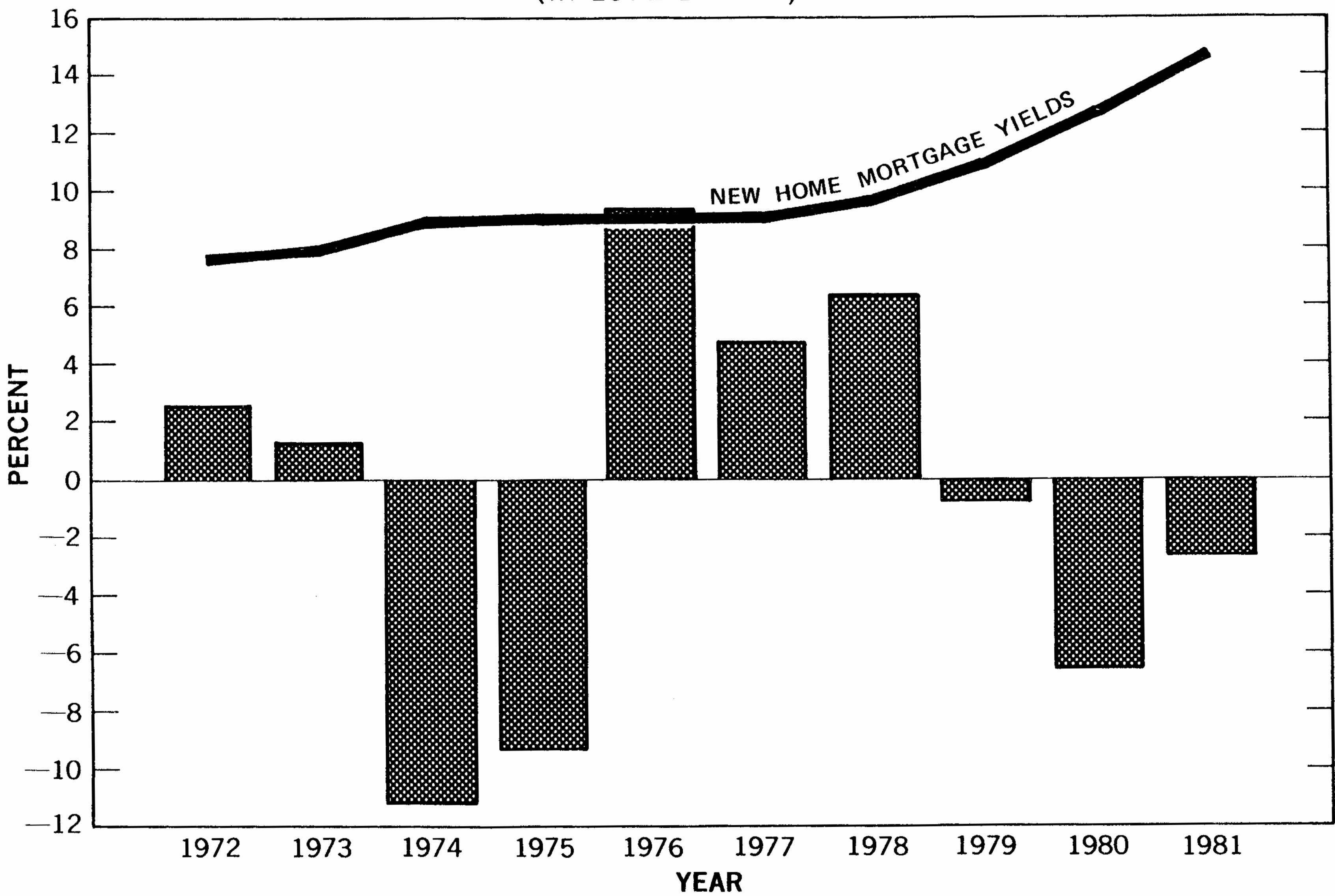
Chart 3. **PERCENT CHANGE IN GROSS DOMESTIC PRODUCT IN MANUFACTURING AND TRADE*AND THE PRIME INTEREST RATE.**

*(in 1972 Dollars)



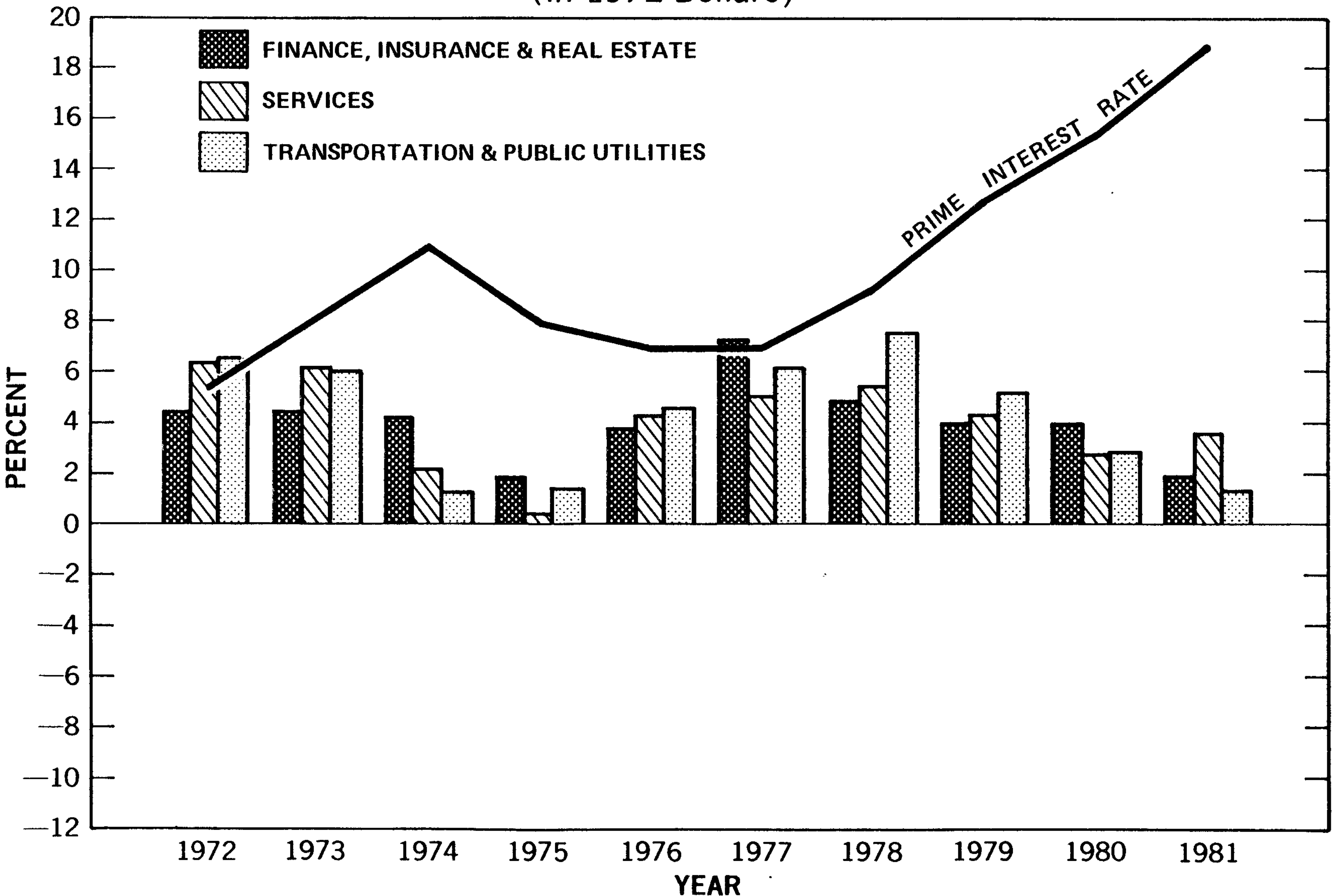

Source: Economic Report of the President, 1982. Tables B-11 and B-67.

Chart 4. **PERCENT CHANGE IN GROSS DOMESTIC PRODUCT IN CONSTRUCTION*AND MORTGAGE YIELDS.**
*(in 1972 Dollars)



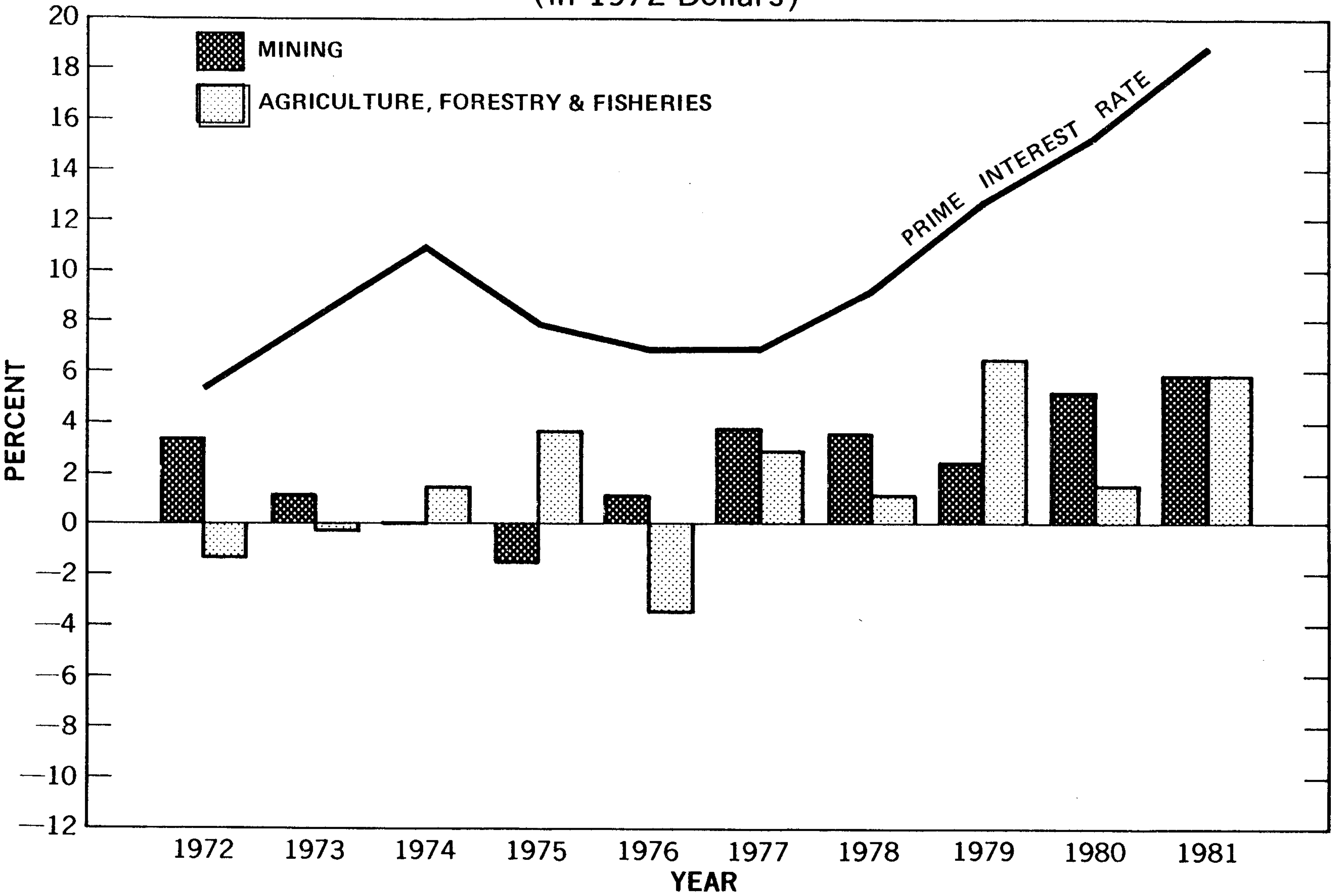

Source: Economic Report of the President, 1982. Tables B-11 and B-67.

Chart 5. **PERCENT CHANGE IN GROSS DOMESTIC PRODUCT IN TRANSPORTATION, PUBLIC UTILITIES AND SERVICES* AND THE PRIME INTEREST RATE.**
*(in 1972 Dollars)




Source: Economic Report of the President, 1982. Tables B-11 and B-67.

Chart 6. **PERCENT CHANGE IN GROSS DOMESTIC PRODUCT IN MINING AND AGRICULTURE, FORESTRY AND FISHERIES*AND THE PRIME INTEREST RATE.**
*(in 1972 Dollars)




Source: Economic Report of the President, 1982. Tables B-11 and B-67.

## VII. CONCLUDING OBSERVATIONS

Every small business is dependent to some degree on credit and capital markets and thus, in some way, large interest rate changes are felt regardless of the establishment employment-size or the industry of which it is a part. However, while this may indeed be the case, some small businesses are more sensitive to financial market activity than others. This report has analyzed only the interest rate effect relative to the 9 major industrial classifications; they are, of course, moved by many other forces as well.

### Capital Requirements

Approximately 15 percent of all business units employing 100 workers or more are in industries in which, on the whole, capital requirements per employee are higher than in other industries. These industries (manufacturing, public utilities and transportation, and mining) account for 2.2 percent of all jobs in the economy.

Because of the wide scope of the manufacturing sector and its structure, manufacturing, as a broad industrial category, contains the largest proportion of businesses with more than 99 employees. However, depending on the specific manufacturing industry involved, capital investment requirements can be either low, medium, or high relative to the number of workers employed. At the bottom of the range in manufacturing are furniture, leather, and apparel, while at the top are petroleum refining, primary metals, tobacco products, and chemicals with a high of $150,900 per worker in the petroleum refining industry.

Credit Requirements

Credit needs include financial requirements that occur either in the production stage or in the post-production process (marketing, sales, and distribution). For most small businesses, these needs are equally crucial. However, while some small businesses require more capital than others, they might not be as sensitive to interest rates in their post-production activities. For example, of the five industries with large proportions of small businesses, contract construction, an industry with relatively little capital invested per employee, is very sensitive to the level of mortgage interest rates in its post-production activities since high mortgage rates seriously dampen home and other real estate sales. (See Chart 4.)

Services, another industry with a high concentration of small firms, also requires low levels of capital investment per employee. But, according to its performance during periods of recent high interest rates, it is not nearly as sensitive to high costs of money as are the construction, retail and wholesale trade industries.

Sales in retail and wholesale trade, another labor intensive industry, is dependent on consumer and business credit, and can react to large movements in interest rates in an inverse way.

Finance, insurance, and real estate are segments of an industry deeply involved with financial markets and the movements of money prices within those markets. Thus, although they are not capital intensive, they have a moderate to high sensitivity to interest rate changes.

Finally, the last of the small business dominated industries, agricultural services, forestry, and fisheries, with the highest percentage of businesses employing fewer than 100 workers, appears not to be as sensitive to interest rates as any of the other industries.

In the capital-intensive industries, transportation and public utilities and mining, in which small businesses are not as heavily concentrated, interest rates affect production (capital investments). However, in product markets, interest rate changes do not seem to affect output significantly. During periods of high interest rate levels, these industries where the corporate form of business is common, the ability to float equity shares might be severely hampered by available higher rates of return on other forms of investments.

In conclusion, considering both capital investment requirements and product market effects, the two industries with high degrees of small business concentration and to a lesser degree, finance, insurance and real estate, are most susceptible to large changes in interest rates from both the production (capital) and post-production (marketing, distribution, sales) sides, while services appears to be the least susceptible to large fluctuations in interest rates.

On the other hand, in manufacturing where small businesses are not as common as in other industries, changes in interest rates can affect both capital investment and sales, depending on the specific manufacturing industry concerned.

Mining, an industry with high capital investment per employee and one in which small businesses are not as numerous as in other industries, appears to have little constant relationship between interest rates and its gross domestic product.

For agricultural, forestry, and fisheries, the data are mixed, but generally data on this industry's production record over a 10-year period indicate little direct relation with interest rate movements.

APPENDIX

CONGRESSIONAL PUBLICATIONS ON SMALL BUSINESS, INTEREST RATES, AND CREDIT, 96TH and 97TH CONGRESSES

## Hearings and Reports


U.S. Congress. House. Committee on Energy and Commerce. Subcommittee on Telecommunications, Consumer Protection, and Finance. Access to Capital by Small Business. Hearings, 97th Cong., 1st sess. July 17, 1981. Washington, U.S. Govt. Print. Off., 1981. 112 p.

U.S. Congress. House. Committee on Small Business. Federal Monetary Policy and Its Effect on Small Business; report. Washington, U.S. Govt. Print. Off., 1980. 56 p. (96th Cong., 2d sess. House. Report no. 96-1435.)

-----. Subcommittee on Access to Equity Capital and Business Opportunities. Federal Monetary Policy and Its Effect on Small Business (part 1--increase in interest rates) Hearing, 96th Cong., 1st sess. Oct. 30, 1979. Washington, U.S. Govt. Print. Off., 1980. 144 p.

-----. (Part 2--Outlook for Construction Industry and Credit Availability for Small Business) Hearing, 96th Cong., 1st sess. Dec. 11, 1979. Washington, U.S. Govt. Print. Off., 1980. 82 p.

-----. (Part 3--Credit Controls and Availability of Credit) Hearings, 96th Cong., 2d sess. Washington, U.S. Govt. Print. Off., 1980. 374 p.
Hearings held April 2 - May 29, 1980.

-----. Subcommittee on General Oversight and Minority Enterprise. Impact of Inflation on Small Business. Hearings, 96th Cong., 2d sess. Washington, U.S. Govt. Print. Off., 1980. 343 p.
Hearings held April 16 - May 13, 1980.

-----. Subcommittee on General Oversight. Impact of the Reagan Economic Program on Small Business. Hearing, 97th Cong., 1st sess. May 19, 1981. Washington, U.S. Govt. Print. Off., 1981. 87 p.

U.S. Congress. Senate. Committee on Small Business. Interest Rates and Business Credit Needs. Hearings, 97th Cong., 1st sess. Parts 1 and 2. Washington, U.S. Govt. Print. Off., 1981. 2 v.
Hearings held Sept. 23 - Oct. 19, 1981.

-----. Select Committee on Small Business. The Impact of Commercial Credit Reporting Practices on Small Business. Hearings, 96th Cong., 1st sess. Washington, U.S. Govt. Print. Off., 1979. 594 p.
Hearings held Oct. 31 and Nov. 1, 1979.

U.S. Congress. Joint Economic Committee. High Interest Rates. Hearings, 97th Cong., 1st sess. Sept. 25, 1981. Washington, U.S. Govt. Print. Off., 1982. 64 p.