

THE IMPORTANCE OF CERTAIN TAX INCENTIVES IN BUSINESS
INVESTMENT DECISION MAKING: THE VIEWS OF BUSINESS DECISION
MAKERS

by

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(ABSTRACT)

Business corporate executives in the State of Virginia were surveyed for their viewed importance of the investment tax credit and the accelerated cost recovery system on their decision making for new equipment.

The executives were divided into groups based upon the reported amount of expected future unused capacity of their firms. The statistical analysis of the groups indicates that decision makers operating relatively close to full output capacity view investment tax incentives as more important than do all others.

Consistent with much of the past research, the findings of this study show that the impact of tax incentives on decision making is only modest. However, the findings also indicate that the viewed importance of investment tax incentives by decision makers is lowest during the period of an economic recession. This suggests that public policy decision makers currently are using investment tax incentives during a period when they will have the least impact.

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Chapter I

INTRODUCTION

The research over the past twenty years which has focused on business tax incentives has not firmly established such as motivators of business decision makers. Tax incentives are used extensively by public policy makers throughout our Federal tax laws in hope of directing the actions of business decision makers. In spite of this wide usage, very little is known of the actual impact that tax incentives have on business decision making or about the types of environments where tax incentives will or will not influence the behavior of decision makers. Consistent with the basic assumption that tax incentives influence business decision making, the 1981 Economic Recovery Tax Act (ERTA) includes numerous provisions designed to encourage decision makers to invest in new capital assets. However, business capital spending has remained low for the past two years and the outlook is dim for the next few years.¹

The purpose of this research is to determine if certain business conditions provide an environment where investment tax incentives are viewed as important by decision makers.

¹ Capital Spending Check Up and Financing Survey, Economics Department, McGraw-Hill Publications Company, New York, NY, March 12, 1982.

The tax incentives used for this research are the investment tax credit (ITC) and the accelerated cost recovery system (ACRS).

A tax incentive is a special tax provision which allows a taxpayer to reduce his or her taxable income or tax liability by taking a certain action. The ITC allows business taxpayers to reduce their immediate tax liability by an amount up to 10% of the purchase price of certain capital assets purchased during the tax year. The ACRS (1981) permits business owners to take a greater amount of depreciation expense during the early years in the life of an asset, thereby deferring some of their income taxes until later years. Depreciation expense is the tax deductible loss of value of business capital assets. Tax liability is the actual tax due by the taxpayer.

The revenue foregone as a result of a special tax provision is referred to as a tax expenditure. The impact of tax expenditures is difficult, if not impossible, to measure. There is the realization that numerous factors affect business investment decisions, and once tax incentives are implemented, it is impossible to determine what action would have been taken in their absence (Bozeman and Link, 1982).

This research centers upon the use of a questionnaire to survey the views of top level business decision makers. Those surveyed were selected from business organizations listed in 50,000 Leading U.S. Corporations (1980) whose corporate headquarters are located in the State of Virginia. The decision makers were asked their views of certain environmental and operational factors pertaining to their organizations. In addition, the decision makers were asked their perceived importance of six factors which may have been considered in their company's business investment decision making process for new equipment. Included in these six factors were the ITC and the ACRS.

The decision maker's perceived importance is defined as the estimated value of each factor as an influence on the outcome of investment decisions. The environmental and operational factors include the estimated future change in demand for the products or services produced by the corporation and the existing ability of the corporation to meet this demand with its present capital. Capital includes buildings, land, equipment, machinery and other assets needed to carry on the business operation. This study deals only with equipment and machinery; it does not include the purchase of land and buildings.

The research data collected were statistically analyzed to determine the impact of the above business environmental factors on the decision makers' perceived importance of investment tax incentives. It is hoped that this study will enhance our understanding of the use of tax incentives as a means of stimulating business capital investment.

The remaining part of Chapter I discusses the background of the problem, the research design and hypotheses, the purpose of the study, and its significance.

Chapter II is a review of the literature on taxation and business investment decision making.

Chapter III discusses the research methodology, the design of the study, the data collection procedures, the sample selection, the survey questionnaire, and the procedures for analysis of the data.

Chapter IV discusses the findings and results.

Chapter V is the summary, conclusion, and implications of the study.

Appendix A defines the technical terms used in this study and can be referred to as necessary.

BACKGROUND OF PROBLEM

The Federal income tax system of the United States is used not only as a means of raising revenue for the financing of government expenditures but also for encouraging economic growth, stabilizing the economy, and encouraging certain desired actions on the part of taxpayers. Current Federal tax laws include numerous credits, subsidies, and special provisions aimed at motivating businessmen into certain courses of action. The list of Federal tax incentives is extensive.² Included in this list are the energy tax credits, targeted jobs tax credits, investment tax credits, accelerated cost recovery allowances, and numerous others.

With the economy of the United States bogged down in the midst of the worst economic slump since the Great Depression, a major thrust of the Reagan Administration's overall economic program intended to revitalize the American economy has been the 1981 Economic Recovery Tax Act (ERTA). The major provisions of ERTA are based upon the assumption that a vast number of business investment and financial decisions are made in response to the tax consequences of these decisions. The tax incentives for businesses provided

² For a complete and in depth discussion of the Federal tax laws, see 1982 Federal Tax Course, Prentice-Hall, Englewood Cliffs, NJ., 1981.

in the Act are intended to stimulate business investment activity on the part of decision makers.

The vitality of major sections of the economy depends in large measure on decisions with respect to expansion and innovation. High tax rates and low depreciation allowances not only affect the volume of funds becoming available for replacements and expansions; they also influence the psychology of the business community and the attitudes of management towards expansion. (Kimmel, 1950)

The major provisions of ERTA designed to increase capital expenditures include new, more generous accelerated depreciation rules and liberalization of the existing investment tax credits.³

The Reagan Administration theorists expected an investment boom as a result of ERTA, but the tax cuts instead have mainly added to the high projected Federal deficits. According to the Federal government, the new favorable tax provisions should save corporations \$9.5 billion in 1982, \$18.1 billion in 1983,⁴ and as much as \$150 billion over a period of five years.⁵ These savings to

³ U.S. Congress (1981), Economic Recovery Tax Act of 1981 [P.L. 97-34], 97th Congress, 1st Session, (August 13, 1981).

⁴ The 1982 and 1983 corporate savings were reported in Capital Spending Check-Up and Financing Survey, Economics Department, McGraw-Hill Publications Company, New York, NY, March 12, 1982.

⁵ The five year Federal government cost estimates in lost tax revenue were reported in the Roanoke Times and World News, July 18, 1982, Roanoke, Virginia.

corporations are a direct cost to the Federal government in lost tax revenue. Unfortunately, the huge costs in lost Federal tax dollars appear to be generating only a very slight return in additional business investment.⁶

A March 1982 McGraw-Hill business capital spending and financing survey concluded that business capital spending when adjusted for inflation would drop 2% in 1982. The McGraw-Hill survey also concluded that the new tax rules would result in only about \$1 billion of additional business investment in 1982 and only about \$2 billion of additional investment in 1983. The disappointing spending plans on the part of the business decision makers raise serious doubt about the strength of the connection between business tax incentives and new business investment.

The history of the use of tax incentives by our public policy decision makers indicates their belief in the basic assumption that taxes and tax incentives influence business decision makers. In the early 1960s, President John F. Kennedy adhered to roughly the same basic assumptions presently being followed by President Reagan. Both President Kennedy and President Reagan prescribed pro-investment tax cuts as a means of encouraging economic growth. The major difference is that the 1962 tax cuts did

⁶ Ibid. #5.

appear to stimulate business capital investment⁷ while the 1981 tax cuts suggest that tax incentives may only stimulate investment activity under certain conditions.

While a vast number of businesses in the U.S. take advantage of lower tax bills because of the numerous tax incentives, it is unclear whether the tax incentives actually motivate the desired behavior or are merely a windfall to businesses. Past research is inconclusive (O'Neil, 1980). Much indicates that the actual impact of tax incentives on investment decisions is modest (Foster, 1981). On the other hand, Surrey (1981) estimates that the lost tax revenue to the Federal Government as a result of tax credits and subsidies exceeded \$200 billion in fiscal year 1980. This represents approximately one third of the total 1980 Federal budget.

The main function of the tax system is to raise revenues appropriate to fiscal and distributional goals. But the Congress and the Executive have superimposed on that function of the tax system the burden of curing many of the ills it sees in our society (Surrey, 1981).

It is anticipated that this study will expand our knowledge of the effectiveness of Federal tax incentives as a means of stimulating desired actions on the part of business decision makers.

⁷ The Annual Report of the Council of Economic Advisors, U.S. Government Printing Office, Washington, D.C., January, 1963, pp. 45-51.

RESEARCH DESIGN AND HYPOTHESES

The major goal of this study is to determine if a relationship exists between the independent variables, certain perceived environmental factors of the business investment decision maker, and the dependent variable, the viewed importance of tax incentives. The major environmental factors to be examined in this research include the decision makers' perceptions of:

1. the expected future change in demand for the products or services of their firms, and
2. the existing capacity of their firms to meet the projected future demand.

For purposes of this study, the following research question is addressed:

Does the level of expected net excess capacity of the firm influence the perceived importance of tax incentives by decision makers?

The net excess capacity of a business firm is a measurement of the firm's unused output capabilities. In this study, a firm's excess capacity (ExC) is defined as the volume of additional product demand that could be met without requiring additional investment in plants, equipment, or other capital assets minus any desired surplus capacity. A firm's desired surplus capacity (DSC) is the amount of intentional slack maintained to meet unexpected

increases in product demand or unexpected equipment down time. A firm's net excess capacity (NExC) is excess capacity (ExC) minus the expected change in product demand (EAD) over a particular time period. A firm's full operating capacity (FOC) is the total volume of goods and services that a firm could produce if its present capital assets were used to their fullest extent. A firm's current Capacity (CC) is the actual volume of goods and services a firm is producing expressed as a percentage of full operating capacity.

The following hypotheses are tested to provide a framework for analysis and to answer the stated research question. HO is the null hypothesis. HA is the alternative hypothesis.

HO: There is no difference in perceptions of the importance of investment tax incentives in investment decision making between decision makers in firms operating near full operating capacity and those in all other firms.

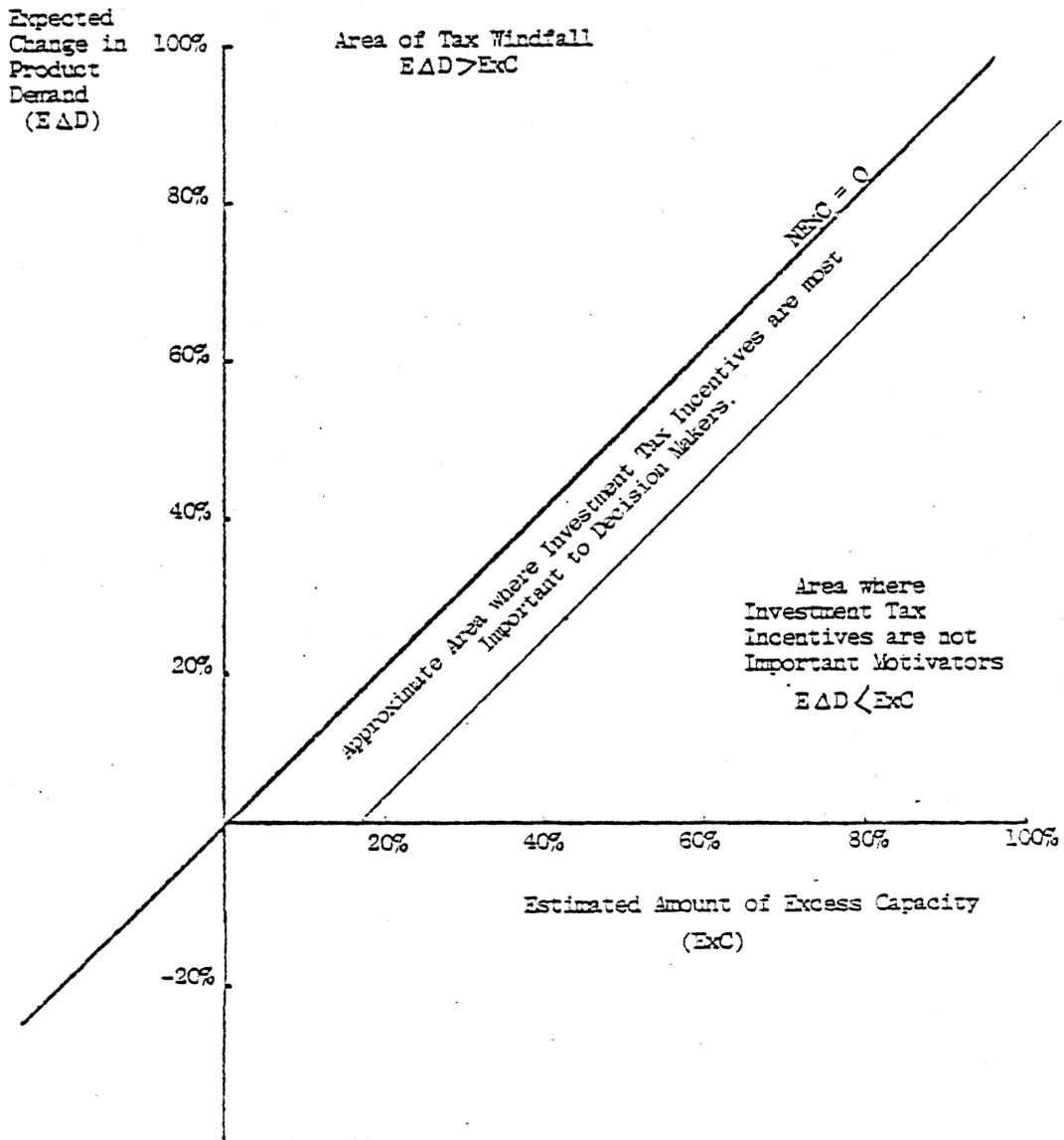
HA: Investment decision makers in firms operating near full operating capacity view investment tax incentives as more important than do all other business decision makers.

Firms approaching zero NExC would be producing near full operating capacity (FOC). Decision makers in these firms are faced with deciding if and when it is appropriate to expand their business capital.

The following figure illustrates the hypothesized relationship between certain perceived environmental factors and the decision makers' viewed importance of investment tax incentives.

The three areas indicated in Figure 1-1 show the approximate sectors where the investment tax incentives are (1) primarily a tax windfall, (2) most important to decision makers, and (3) not important motivators of decision makers. The area of tax windfall is located where $EAD > ExC$. In this business environment, a firm's expected future demand for its products and/or services is viewed by the decision maker as being greater than its present full operating capacity. The decision maker here is expected to invest in new capital assets even in the absence of the tax incentives and thus a tax windfall is received by the firm.

The area where investment tax incentives are most important to decision makers is located where the EAD is approximately equal to ExC . Under these conditions, the firm will be producing close to its full operating capacity (FOC). In this situation, the decision maker must determine whether there is a need to invest in additional capital assets. As a firm approaches FOC, investment tax incentives may provide a marginal difference in the investment decision making for new capital assets; here the viewed importance of tax incentives should be the highest.



Expected Product Demand, Excess Capacity, and the Decision Makers' Perceptions of the Importance of Investment Tax Incentives

Figure 1-1

The area where investment tax incentives are not important motivators is located where the EAD is substantially less than ExC. In this business environment, a firm has more operating capacity than is expected to be needed. The decision maker here will have no perceived need for additional capital investment and will not be motivated by tax incentives to invest in additional capital assets.

In establishing the three above areas for analysis in this study, the researcher recognizes that numerous factors may influence the business investment decision making process and how close to FOC a decision maker is willing to go before considering new capital investments. In some industries, if a firm cannot meet an increase in the demand for its product, it will lose customers to other firms in the industry that are able to meet this demand. As a result, decision makers will often maintain a certain amount of excess capacity in order to meet unexpected changes in product demand or unplanned equipment down time. We refer to this amount of excess capacity as desired surplus capacity. Numerous authors refer to a similar type of excess capacity as organizational slack (March and Simon, 1958; Thompson, 1967; Perrow, 1979).

Also, firms in certain industries may take longer than others to put capital assets in service after a decision is made to expand. Time lag (Δt) is the time difference between the decision to invest in additional capital assets and the actual completion of the investment project whereby the firm's FOC is increased to a new level. The longer the time lag, the further in advance a decision must be made to meet the expected future demand. The above factors and certainly others may influence how close to FOC a decision maker is willing to go before considering new capital investments.

This researcher believes that the exact level of FOC where decision makers begin to consider the purchase of new capital assets can be determined only for individual decision makers, in specific firms, examining the need for a certain type of new asset at a particular point in time, and under specific business conditions. With this in mind, the exact location of the area where investment tax incentives are most important to decision makers is open for criticism wherever established for the sake of analysis.

According to Data Resources, Inc., business capital investment spending begins to pick up when the manufacturing industry is operating at about 83% of its existing-capacity. The percentage reported by Data Resources, Inc. is referred

to as capacity utilization and is simply the percentage of full operating capacity that manufacturers are producing. Idle capacity is $1 - \text{capacity utilization}$. This reported percentage does not take into consideration the desired surplus capacity nor the expected change in product demand by decision makers which are included in this study.

Without taking into consideration this expected change and the decision maker's desired surplus capacity, we would find it difficult to establish any level of capacity utilization as a determinant of the perceived need for additional capital assets. Theoretically, a firm could be producing at 95% of its FOC but the decision maker may expect a decline in product demand and thus have no perceived need for additional capital assets. In a different situation, a firm may be producing at only 70% of its FOC but the decision maker may expect a substantial increase in product demand and perceive a need for new capital equipment.

With the inclusion of the decision maker's expected change in product demand and desired surplus capacity in computing net excess capacity (NExC) in this study, the firm's relationship to FOC is defined and calculated differently here than when expressed as an idle capacity percentage. In spite of the differences in calculations

between NExC and idle capacity, both produce a rather similar measurement of the firm's relationship to FOC. In some respects, NExC may be viewed as the decision maker's estimated future idle capacity expressed as a percentage of sales volume reduced by the desired surplus capacity. Recognizing that the exact level of FOC where capital investment begins to pick up is unknown, the area where investment tax incentives are most important to decision makers is defined using Data Resources, Inc.'s earlier reported findings. This area is identified as being $0 < \text{NExC} < 17\%$. Decision makers reporting a NExC for their firms in this area are expected to view the importance of tax incentives higher than decision makers outside of this area. Decision makers in this area are on the borderline for needing additional equipment. Those in firms with $\text{NExC} < 0\%$ are expected primarily to receive a tax windfall. In this group, investment in capital assets is expected to occur even in the absence of any tax incentives. Decision makers in firms with $\text{NExC} > 17\%$ are not expected to view the importance of investment tax incentives highly because of their lack of need for additional equipment. It is anticipated that the areas will describe how the majority of decision makers in each area view the importance of tax incentives.

Chapter II is a review of the literature on taxation and business investment decision making.

Chapter II

REVIEW OF THE LITERATURE

This section is a review of the literature dealing with taxation and business investment decision making, the underlying assumptions behind investment tax incentive legislation, and the evidence on the effectiveness of business investment tax incentives.

TAXATION AND BUSINESS INVESTMENT DECISION MAKING

The tax consequences of actions available to business decision makers appear to have a major impact on the actions selected. Numerous authors state that taxation is an important factor in the environment of the business decision maker. Taxation may influence the form of business organization, the manner of operation, the ratio of borrowed funds to equity investment used in the business, the way assets are bought and sold, the time period that assets are held, when certain income is reported, and numerous other business decisions. Of the important financial decisions that business managers have to make, few can be made without having some tax consequences (Holzman, 1965).

Tax factors abound in virtually all types of business decisions concerning the acquisition, retention,

disposition, and replacement of machinery, equipment, and buildings. An astute business decision maker will consider the tax implications of the available courses of action prior to making a decision on any financial matter (Smith, 1968).

The major inducement of a tax incentive is that it provides additional after-tax profits to the business firms taking advantage of it. In this way, tax incentives result in more capital investment projects being viewed as economically feasible by business investment decision makers (Kimmel, 1950).

The determination of an investment project's economic feasibility is, in essence, an application of a classic proposition from the economic theory of the firm. This proposition states that a business firm should invest in any new capital project where the marginal revenue generated from the project exceeds the marginal costs of the capital funds associated with it (Weston and Brigham, 1982).

Tax incentives appear to influence capital expenditures in two ways: (1) by reducing the price of capital and thereby increasing a firm's desired stock of capital; and (2) by increasing the flow of internal funds available for financing the purchases of capital investment projects and thereby facilitating the adjustment of capital assets to the

desired levels (Coen, 1968). These findings are consistent with the basic economic concepts presented by Samuelson. He states that there exists at any one time a definite relation between the market price of a good and the quantity demanded of that good. Other things being equal, the lower that market price, the more units will be demanded (Samuelson, 1976).

A widely held assumption is that tax incentives may be used to direct the actions of business decision makers by reducing the costs of certain actions. "If capital services cost less as a result of tax incentives, businessmen will employ them" (Hall and Jorgenson, 1971). By reducing costs, tax incentives enhance the profitability of the business by allowing the firm to pay lower taxes if certain actions are taken by the decision maker.

"Tax policy changes are almost immediately reflected in the economic behavior of people....People are not irrational. They are pretty good at figuring out what's best for them."
(Regan, 1979)

THE UNDERLYING ASSUMPTIONS BEHIND BUSINESS INVESTMENT TAX INCENTIVE LEGISLATION

Prior to the 1960s, tax credits were used as a part of our tax system to eliminate the burden of double taxation or to reduce the burden of taxes on certain types of income. This changed in 1962 when the Investment Tax Credit was

enacted into law. Its primary purpose was to stimulate investment in productive facilities such as new plant and equipment. It was also intended to have an indirect impact on employment by increasing the demand for goods. During the early 1960s, the Kennedy Administration argued that the investment tax credit would be an incentive to firms to increase investment spending and that the resulting modernization and expansion would stimulate the economy and employment (O'Neil, 1980).

The assumption that tax policy can be used effectively for purposes other than generating revenue is widely evident in our Federal tax laws. Taxation is considered to have a major influence on the economic well-being of our society. Productivity depends on the size of the capital stock, the quality of human resources, the attitudes and skills of management, the efficiency of resource use, and the amount of technological progress. Most of these factors are influenced to some extent by government expenditures and tax policy. To increase the rate of economic growth, the Federal government can increase investment in physical and human capital directly through its own expenditures and it can adopt tax measures that provide incentives for private savings and investment (Peachman, 1977).

In talking about the effect of taxation on the economy, Donald T. Regan stated that the need for new (tax) policies to encourage business capital investment is readily apparent.⁸ Taxation in general, and specifically investment tax incentives, are assumed to have a major impact on business investment decision making.

THE EVIDENCE ON THE EFFECTIVENESS OF BUSINESS INVESTMENT TAX INCENTIVES

Despite all the faith in the use of tax incentives as a means of stimulating business decision makers, there remains the troubling question concerning the extent to which they respond in their decision making.

The cause-effect relationships, that tax incentives motivate taxpayers to behave or act in a certain way so that they will receive the benefit of a lower tax bill by utilizing the tax incentive, has never been firmly established. Much of the literature indicates that taxation does have a major impact on the actions of business decision makers (Holzman, 1965; Smith, 1968; Hall and Jorgenson, 1971; and others). However, past research has failed to identify and specify the conditions under which taxpayers will or will not respond to tax incentives.

⁸ Mr. Regan made this statement on taxation in an address before the Continental Bank Conference on Taxation, Chicago, Illinois, December 4, 1979.

In 1967, a Brookings Conference of experts on tax incentives and capital spending was called in an attempt to evaluate the effect of tax incentives enacted since World War II on capital spending. Each study presented at the Conference measured the same phenomenon, the effect of tax incentives on capital spending, but each obtained different results. The experts at the Conference agreed that the investment tax credit is effective in increasing investment spending, but disagreed on (1) the timing of investment expenditures, (2) the effect of tax incentives on short term economic stability and (3) whether the cost of the investment tax credit as a program was worth the benefits generated. Four different investment models were presented at that 1967 Brookings Conference. The studies were extremely complex and employed sophisticated conceptual frameworks and empirical analysis. As noted, each of the studies reached different conclusions as to the effectiveness of tax incentives as a stimulus on investment.

In the past fifteen years, approximately half of the major empirical studies on the effectiveness of tax credits concluded that the investment tax credit was not effective in achieving its goal of stimulating economic expansion by significantly increasing business investment in capital assets. The other half of the research supports the

effectiveness of the ITC as a stimulus on such. The past research raises serious questions about the actual impact of tax incentives and the appropriateness of their use as a means to stimulate decision makers. (See Table 2-1 for the Major Empirical Studies of the Investment Tax Credit).

Table 2-1

Major Empirical Studies of Investment Tax Credit

Author	Title	Date	Methodology	Research Supports Effectiveness of ITC
Bakay and Christiansen	"The Role of Accelerated Depreciation and the Investment Tax Credit in Stimulating Business Growth."	1973	Interview	Yes, for large firms.
Bischoff	"The Effect of Alternate Lag Distributions."	1971	Econometric	Yes.
Brimmer and Sinae	"Effects of Tax Policy on Capital Formation."	1976	Econometric	No.
Castellano	"The Effects of the Investment Tax Credit."	1972	Interview	Yes.
Edwards	"Effects of Federal Income Tax on Capital"	1966	Interview	No.
Eisner	"Determinants of Capital Expenditures."	1956	Interview	No.
Eisner and Lawler	"Tax Policy and Investment: An Analysis"	1975	Questionnaire	No.
Foster	"An Empirical Analysis of the Potential Differential Impact of the Investment Tax Credit on Investment in Capital Goods."	1981	Econometric	No.
Frateck	"Microeconomic Analysis of the Impact of Tax Policy on Investment Expenditures."	1970	Econometric	Yes, for large firms.

Table 2-1 (Continued)

Author	Title	Date	Methodology	Research Supports Effectiveness of ITC
Halvorson	"Can Taxes Condition the Economy?"	1969	Interview	No.
Hall and Jorgenson	"Tax Policy and Investment Behavior."	1967	Econometric	Yes.
Johnson and Carey	"Effect of Investment Tax Credit on Equipment Replacement Decisions."	1970	Econometric	Yes, if ITC > 7%
Klein and Taubman	"Estimating Effects within a Complete Econometric Model."	1971	Econometric	Yes.
Poindexter and Jones	"Effect of Recent Tax Policy Changes on Manufacturing Investment.:"	1973	Econometric	Yes, for large firms.
Stout	"Tax Policy and Capital Formation."	1977	Questionnaire	Yes.
Wilson	"A Study of the Investment Tax Credit on Capital Investment from 1962-1969."	1979	Econometric	No.

This table was reproduced from Cherie Jeanne O'Neil, "The Impact of the Targeted Jobs Credit on the Employment Decision Process", Doctoral Dissertation, University of Colorado, 1980.

The use of tax incentives is controversial (Clouse, 1980). While tax credits and subsidies provide the advantage of less direct government control, the major criticism of tax incentives, such as the investment tax credit and accelerated depreciation, is that businesses can receive a tax benefit from an investment decision not influenced by the incentive. When tax savings is not a factor in that decision, the corporation receives a windfall.

The McGraw-Hill Publications Company Department of Economics regularly reports and interprets business and economic trends. During much of the 1960s, their annual surveys included questions on the impact of the investment tax credit on business capital investment decisions. Eisner and Lawler (1975) analyzed the responses to the McGraw-Hill surveys of firms in non-financial industries for the years 1963-66 and 1968. According to the authors, the survey responses indicated only modest effects of tax measures designed to stimulate or encourage capital expenditures.

Numerous researchers have attempted to determine the cost effectiveness of tax incentives. Brimmer and Sinai (1976), for example, performed a simulation study using the quarterly econometric model of the United States developed by Data Resources, Inc. for the period 1976-80. Their study

indicated that an increase in the investment tax credit from 10 percent to 12 percent would increase investment in equipment by only 33 cents per \$1.00 of tax credit.

With the inclusion of numerous business investment tax incentives in the 1981 Economic Recovery Tax Act, McGraw-Hill decided to include questions on relevant impacts in the 1982 survey.⁹ The March 1982 McGraw-Hill annual survey of U.S. Business Plans for New Plants and Equipment concluded that the business investment tax incentives included in ERTA would result in only about \$1 billion of additional investment in 1982 and a mere increase of \$2 billion of additional investment in 1983. According to Federal government projections, the new favorable tax provisions should save corporations approximately \$9.5 billion in 1982 and \$18.1 billion in 1983. If both sets of estimates are accurate, each dollar of additional investment is costing approximately nine dollars in lost tax revenue. It appears that not only are business investment decision makers not responding as expected to the tax incentives, but also, that the business firms using the tax credits are primarily receiving a windfall tax benefit.

⁹ This information was received by the researcher in a telephone conversation with Joseph N. Spiers, Senior Economist, Economics Department Information Products, McGraw-Hill Publications Company, New York, New York, September, 1982.

Taxation does influence human behavior. However, most tax laws are enacted without adequate consideration of their behavioral effects (Crumbly, 1973). The most recent illustration of the passage of large scale tax legislation intended to stimulate the behavior of certain taxpayers was the ERTA. Shortly after President Reagan was elected, his economic advisors recommended the use of business tax cuts and tax incentives as the best remedy for the sluggish economy. The assumption was that decision makers would respond to the tax cuts and tax incentives with an outpouring of funds for new capital investments. Congress accepted the Administration's tax policy in its passage of the Act.

Critics of tax breaks for business note that, despite periodic new tax advantages, business capital investment has not increased greatly when measured over the last two decades.¹⁰ In spite of this uncertainty, the use of business investment tax incentives appears to be firmly established as a major part of our Federal tax policy.

As long as tax incentives or disincentives remain in the tax structure, a tax policy maker's major objective, other than raising revenue, will be to influence behavior. In order to accomplish this objective, the policymaker must function with some knowledge of human behavior (Crumbly, 1973).

¹⁰ Report by the Comptroller General of the United States, Investment Tax Credits: Unresolved Issues, May 8, 1978.

Chapter III discusses the research methodology, the design of the study, the data collection procedures, the sample selection, the survey questionnaire, and the procedures for analysis of the data.

Chapter III
RESEARCH METHODOLOGY

INTRODUCTION

This project attempts to identify the business environmental factors likely to enhance the effectiveness of investment tax incentives.

A survey of the views of top level business decision makers is considered appropriate for this study because they are the targeted individuals whom the investment tax incentives are suppose to influence. Their assessment of the importance of tax incentives on their investment decision making may be considered a good indication of the ability of tax incentives to influence their decision making.

This chapter describes the design of the study, the data collection procedures, sample selection, the survey, and the procedures for statistical analysis of the data.

DESIGN OF THE STUDY

The design of this research is concerned with two major objectives: (1) to obtain a description of the decision makers' perceptions of their companies' expected future product demand, and existing idle capacity; and (2) to obtain their viewed importance of the investment tax credit and the accelerated cost recovery system on their capital investment decision making for new business equipment.

DATA COLLECTION PROCEDURES AND SAMPLE SELECTION

The data for this study were collected through the use of a descriptive survey. The survey was performed using a researcher-constructed questionnaire. The data were obtained from members of business organizations who are involved in the capital investment decision making process within their respective organizations. Each respondent was asked if he or she had made or participated in making decisions concerning the purchase of new assets for the company. The organizations included in this study were randomly selected from the companies whose corporate headquarters are located in the State of Virginia and which are included in the publication 50,000 Leading U.S. Corporations.

The companies included in the 50,000 Leading U.S. Corporations account for up to 90% of the sales in their respective standard industrial classification. The information provided on each company listed in this publication includes: the company name, address, city, state, zip code, telephone number, name of the chief executive officer, sales in millions, and number of employees. For companies whose stock is publicly held, in addition to the chief executive officer, the company's four top corporate officers are also included.

The following table shows the number of companies included in the 50,000 Leading American Corporations headquartered in the State of Virginia, from which the sample was drawn.

Table 3-1
Virginia Companies Listed In
50,000 Leading U.S. Corporations

Standard Industrial Classification	Number in Virginia	Number from which the sample was drawn
Agriculture	3	
* Mining	20	20
* Construction	89	89
* Manufacturing	253	253
* Transportation, Communications, and other Public Utilities	57	57
* Wholesale and Retail Trade	265	265
Finance, Insurance, and Real Estate	54	
Services	18	
<hr/>		
Total Virginia Companies listed in <u>50,000 Leading U.S. Corporations</u>	759	
Total Virginia Companies from which the sample was drawn		684

*The companies surveyed for this study were selected from these standard industrial classifications.

The total population consisted of 684 business organizations. Pre-approach letters were sent to 169 decision makers randomly selected from the total population. The pre-approach letter was mailed to the sample company's president or vice president of finance, where one was listed. This letter introduced the researcher and the project, and mentioned that the researcher would be telephoning in the near future to request certain information pertaining to his or her perceptions of the important factors considered in the company's capital investment decision making. A copy of the survey questions was attached to the letter to acquaint respondent with the type of information to be requested. Telephone calls were made approximately one week after the letters were sent. The respondent's anonymity was insured, and an offer was extended to provide a summary report of the survey's findings when completed. Contact was made with 111 of the 169 decisionmakers and 102 usable questionnaires were completed.

The telephone was used to gather the relevant data, save the decision maker's time, increase the response ratio, and provide the opportunity for a two-way exchange to clarify technical questions. As can be seen from the above response information, the telephone method used in gathering

data for this study was quite effective. The top level decision makers were accessible and very cooperative.

THE BUSINESS CAPITAL INVESTMENT SURVEY

The survey included questions necessary to compute the independent and dependent variables. Questions were also included to screen the exact purpose of the project from the decision makers. The heading of the questionnaire, presented in Appendix C, requests information pertaining to the decision maker's job title, type of industry of the company, and the size of the company based upon the number of employees. The standard industrial code classification of the company was also included in the heading of page one.

Question One

Over the past year, what were the most important factors considered by your company in making capital investment decisions for new business equipment?

This open ended question was not intended to gather data that could be statistically analyzed. It was included (1) to get the decision makers to begin talking about capital investment decision making in their company and (2) to see if factors other than the six included in this survey were considered important. The six factors are listed on the following page.

Question two requests information on whether the business investment tax incentives included in ERTA attracted the attention of decision makers to the possibility of new capital outlays for business equipment during the past year.

Questions three and four highlight the viewed importance decision makers place on six factors which may be considered during the investment decision making process. The respondents were asked to rate the importance of each of the six factors on a scale from 1 to 10. The amount of viewed importance was quantified in the following manner:

1	2	3	4	5	6	7	8	9	10
Not		Somewhat		Moderately		Very		Extremely	
Important		Important		Important		Important		Important	

The six factors that the decision makers were asked to rate were:

- A) The availability and cost of the funds needed for financing the purchase of new equipment
- B) Anticipated increases in sales for the products or services produced or supported by the new equipment
- C) The replacement of worn out equipment in order to maintain the firm's existing ability to produce

- D) A lower tax bill as a result of using the investment tax credit allowed for purchasing new equipment
- E) A lower tax bill as a result of using the 1981 accelerated cost recovery system when depreciating newly purchased business equipment
- F) The improvement of operating productivity and efficiency.

The respondents were also asked to rank order the six factors in the order of importance they believed was placed on each factor in their company's capital investment decision making for new equipment. The rank ordering served as a check on the importance rating.

Question Four

In viewing the above listed factors, please rank order the factors in the order of importance that you believe is placed on each factor in your company's capital investment decision making for new equipment.

Your Rank Order (Place the letters of the factors below.)

- | | | |
|----|--|-----------------|
| 1. | | Most Important |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | Least Important |
| 6. | | |

The decision maker's responses to parts "D" and "E" of question three provide the viewed importance of tax incentives. The business environmental conditions hypothesized to have an influence on the amount of importance placed on tax incentives by decision makers are obtained in questions five, six and seven.

Question five asks for the respondent's estimate of the expected change in product demand over the next twelve months. Question six requests the estimated percentage of unused capacity within the firm. Unused capacity is the amount of additional sale volume that could be handled by the firm without requiring additional assets. Question seven requests the amount of surplus capacity the decision maker would normally like to maintain.

Question eight asks the decision makers to estimate the approximate time that it would take to expand maximum output capacity. Question nine seeks to determine if the decision makers anticipate increasing the number of persons employed by their companies in the next 12 months. The answers to these two questions were not used to compute either the independent or dependent variables but were included to obtain general information about the firms.

THE PROCEDURES FOR STATISTICAL ANALYSIS OF DATA

The independent variable is the decision maker's perceptions of his firm's net excess capacity (NExC). If needed, refer to Appendix A for the definition of net excess capacity. This key business environmental factor is determined from the information provided by each respondent pertaining to: (1) the expected change in product demand, (2) the estimated amount of existing unused capacity, and (3) the desired surplus capacity. The decision makers' viewed importance of investment tax incentives is the dependent variable.

To compute the net excess capacity (NExC), we use the following procedure:

$$\text{NExC} = \text{ExC} - \text{EAD}$$

Net Excess Capacity = Excess Capacity - Expected Change in Product Demand

ExC is based upon the estimated percentage that the firm's present sales volume could increase without requiring additional investment in new equipment (survey question six). From this is subtracted the desired surplus capacity (survey question seven). EAD is the decision maker's expected change in company sales over the next twelve months (survey question five).

To determine if decision makers operating under different levels of NExC view the importance of tax incentives differently, the respondents are divided into three groups. Group one includes decision makers in firms that have a negative NExC. Tax incentives are expected to be viewed with relatively low importance (for investment) by the decision makers in this group because they would be primarily windfalls.

Group two includes respondents in firms where the expected sales will cause operating capacity to move close to its maximum level. Firms in this group have relatively low amounts of NExC, that is, they are on the borderline between investing in additional business machinery and remaining at the existing output capacity level. This is the area where tax incentives are expected to be viewed with the most importance.

Group three includes decision makers operating in firms that have high NExC. The tax incentives are expected to be viewed with relatively low importance. The companies will have little need for additional equipment. In drawing the lines for separating the three groups, the levels of NExC selected by this researcher were intended to be appropriate for decision makers across the major industries included in this study. As previously mentioned in Chapter 1, group one

consists of the decision makers in firms with NExC less than 0; group two with NExC between 0 and 17%; and group three with NExC greater than 17%. The three groups are identified on Figure 1-1, page 12.

To test statistically the previously stated hypothesis, we perform a t test on the differences of the decision makers' viewed importance of tax incentives.¹¹ First, the three groups are reduced to two. Group A includes decision makers in business firms with NExC between 0 and 17%; group B includes all others. The decision makers in firms with $NExC < 0$ and those in firms with $NExC > 17\%$ which comprise Group B are expected to view tax incentives with a relatively low degree of importance, but for different reasons. Decision makers in firms with $NExC < 0$ are expected to receive a tax windfall. Decision makers in firms with $NExC > 17\%$ are not expected to be motivated by the tax incentives. Statistical analysis of the data is conducted to determine if group A views the importance of investment tax incentives greater than B.

¹¹ According to C. William Emory, Business Research Methods, Irwin, Homewood, Illinois 1980, p. 444, the recommended statistical technique for hypothesis testing in a two-sample case where interval or ratio measurement is used is a t - test.

The variable for the t test becomes the average of factors D and E (the importance ratings given to ITC and ACRS) of question three of the survey.

In addition to conducting a t test, we carry out a Pearson correlation analysis on the relevant data to measure the association of the estimated amount of NExC (independent variable) with the viewed importance of tax incentives ($D + E/2$ for each respondent).

In reaching a decision about accepting or rejecting a null hypothesis, two types of error may arise. If the alternative hypothesis is accepted when the null hypothesis is true, this is called a Type I error. If the null hypothesis is accepted when the alternative hypothesis is true, this is called a Type II error. The consequences involved in making a wrong decision about accepting or rejecting the null hypothesis will influence the desired level of significance used in hypothesis testing (Ferguson, 1976). In this study, if the null hypothesis is accepted, when in fact the alternative hypothesis is true (Type II error), an opportunity for improving the effectiveness of tax incentives may be missed. If the alternative hypothesis is accepted when in fact the null is true (Type I error), any resources for additional follow up research on business environments and their impact on the viewed importance of

tax incentives may be wasted. This research statistically tests for a Type I error.

The level of significance selected in hypothesis testing helps to establish the degree of certainty that a researcher may place on the findings of a study. The most common level of significance used in business and social science research is the .05 level of significance. At the .05 level of significance, researchers and policy makers relying on the findings of researchers can be 95% confident that a Type I error has not been made. Under these conditions, there is a .95 probability that any observed difference is true and not due to sampling (Emory, 1980). This researcher believes that the .05 level of significance is appropriate for this study. If there is a .95 probability that the approximate level of NEXC identified in this study enhances the viewed importance of tax incentives, additional research may be warranted and the opportunities for improving the effectiveness of tax incentives may be substantial.

The next chapter describes the characteristics of the respondents to the survey, summarizes the data collected, and discusses the statistical findings and results of the study.

Chapter IV
FINDINGS AND RESULTS

INTRODUCTION

As previously stated, a total of 169 pre-approach letters were sent to business investment decision makers in the State of Virginia. Telephone calls were made approximately one week after the letters were sent. If contact were not made on the first attempt, at least three additional follow ups were undertaken. As a result, telephone contact was made with 111 company presidents, vice presidents, or other decision makers during the data collection period. Out of these, 102 usable surveys were completed.

SURVEY RESPONDENTS

The respondents had the following job titles within their organizations. As can be seen, we were able to contact one of the top two executives over 75% of the time.

Table 4-1
Job Titles of Respondents

Job Title	Number	Relative Frequency (Percentage)
President or Chief Executive Officer	78	76.5
V. President	14	13.7
Treasurer or Controller	6	5.9
Miscellaneous	4	3.9
Total	102	100

The decision makers represented companies in six types of industries based upon the standard industrial classification. It is important to note that manufacturing predominated, even though it would be far lower in percentage of gross state product.

Table 4-2

Industrial Classification of Companies Surveyed

Industry	Number	Relative Frequency (Percentage)
Mining	4	3.9
Construction	20	19.6
Manufacturing	37	36.3
Transportation, Communica- tions, and other public utilities	5	4.9
Wholesale	24	23.5
Retail	12	11.8
Total	102	100%

The companies included in this study represented 9% to 22% of the Virginia companies by SIC listed in 50,000 Leading U.S. Corporations. The total percentage of listed Virginia companies sampled was 15%.

Table 4-3

Percentage of Virginia Companies Surveyed by SIC Code

Standard Industrial Classification	Number in Virginia	Sample	Percentage of Virginia Companies by S. I. C.
Mining	20	4	20%
Construction	89	20	22%
Manufacturing	253	37	15%
Transportation, Communications, & Other Public Utilities	57	5	9%
Wholesale & Retail	265	36	14%
Total Number from which the Sample was drawn	684		
Sample Size		102	
Percentage of listed Va. Companies Sampled			15%

Decision makers represented companies which predominantly employed over 100 people. The smallest company had less than 10 employees; the largest over 36,000 employees. The average number of employees per company was 1059. Two firms had over 30,000 employees. If these are excluded, the average size becomes 251.

Table 4-4
Size of Companies Surveyed

Company Size by Number of Employees	Number of Companies	Relative Frequency (Percentage)
less than 100	48	47.1%
100 to 1000	47	46.1%
over 1000	7	6.9%
Total	102	100%

RESPONSE SUMMARIES OF THE DATA FOR EACH SURVEY QUESTION

The responses to the business capital investment survey that were provided by the 102 decision makers are tabulated and summarized below. Where appropriate, summaries of the data are provided for decision makers according to SIC code and estimated NEXC.

Question One

Over the past year, what were the most important factors considered by your company in making capital investment decisions for new business equipment?

The tax advantages available from the purchase of new business equipment was mentioned by only 3 of the 102 respondents as being among the most important factors. An early indication thus is that investment tax incentives are viewed by the vast majority of decision makers with a lower degree of importance than numerous other factors. A summary of the response to question one is included in Table 4-5.

Table 4-5

Most Important Factors Considered in Investment Decisions

Factors mentioned as being among the most important factors considered:	Number of Respondents Who Mentioned the Factor
1. Additional need for the asset in the business operation.	37
2. Benefit/Cost Analysis such as Net Present Value, Internal Rate of Return, Payback, or improvement of cash flow.	33
3. Expected future sales for the products and/or services pro- duced by their company.	28
4. Cost and availability of the funds needed for financing the new investment.	18
5. Improvement of Operating Efficiency	15
6. Capital Replacement	15
7. State of the economy and general business outlook	7
8. Tax advantages from the new investment in business equipment	3

Question Two

Did the new accelerated cost recovery system and/or the more liberal investment tax credit included in the 1981 Economic Recovery Tax Act attract your attention to the possibility of new capital outlays for new business equipment for your company during this past year?

Total Responses 48 = yes 54 = no

Slightly over half of the total respondents mentioned that the new investment tax incentives did not attract their attention.

The summary responses to question two according to both the SIC code and size of the companies are included in Table 4-6.

Table 4-6

The Attention Impact of Investment Tax Incentives

Responses by SIC Code	Did the new investment tax incentives attract your attention?		
	Yes	No	N
Mining	4	0	4
Construction	10	10	20
Manufacturing	17	20	37
Transportation, Comm., Pub. Util.	1	4	5
Wholesale	12	12	24
Retail	4	8	12
Totals	48	54	102
<hr/>			
Company Size by Number of Employees	Yes	No	N
less than 100	25	23	48
100 to 1000	24	23	47
over 1000	3	4	7
Totals	48	54	102

Table 4-7

Mean Ratings of Certain Decision Making Factors and NExC

Total Respondents N=102	NExC<0 Respondents N=23	0>NExC<17% Respondents N=36	NExC>17% Respondents N=43
A 6.56	6.70	6.11	6.86
B 7.74	7.91	7.64	7.72
C 7.08	7.00	7.58	6.70
D 4.37	4.17	5.00	3.95
E 4.36	4.44	4.94	3.84
F 7.52	7.65	8.03	7.00

Decision makers in firms with NExC greater than zero but less than 17% viewed the importance of tax incentives (factors D and E) higher than did the others. However, even for this group, the other four factors listed were viewed with substantially greater importance than the tax incentives.

When the mean ratings were tabulated according to the SIC code, the tax incentives again consistently received the lowest importance ratings. Across all the industries surveyed and each level of NExC grouping, tax incentives were rated by the decision makers as being of lower importance than all of the other listed factors.

Table 4-8

Mean Ratings of Certain Decision Making Factors According to SIC Code

	I	II	III	IV	V	VI
A.	7.750	6.800	6.297	7.000	6.417	6.667
B.	6.000	7.450	7.865	6.000	7.875	8.833
C.	7.250	7.200	7.054	8.200	6.583	7.417
D.	2.250	3.850	4.162	4.200	5.375	4.667
E.	2.250	3.950	4.135	4.200	5.208	4.833
F.	8.000	6.350	7.784	7.600	7.708	8.083
Sample Size	4	20	37	5	24	12

I=Mining, II=Construction, III=Manufacturing, IV=Transportation, Comm., and Public Util., V=Wholesale, VI=Retail.

The viewed importance of the tax incentives by decision makers was the highest in the wholesale industry and the lowest in mining. An initial expectation of this researcher is that more of the firms in the wholesale industry are operating in the approximate area where tax incentives are most important and the firms in the mining industry are operating predominately outside this area. Other factors that might contribute to the higher ratings in the wholesale industry and the lower in mining are the types of assets being used by the firms in each of these industries, the time required to put these assets in service, and the specific tax incentives applicable to these assets.

Much of the equipment used in the wholesale industry, such as delivery trucks, may be purchased and put into service in only a matter of days. It is speculated by this researcher that some of these assets may be purchased as the firms near the end of their tax years so that the deductions may be taken. Also, much of this equipment has very favorable tax treatment under the ACRS and ITC provisions. Light duty trucks, for example, may be fully depreciated for tax purposes in only 3 years, and a 6% ITC is available the year of purchase. Machinery used in the mining industry is quite different. Mining equipment often is special ordered and the time period needed to put this type of asset in

service may be several months or longer. Also, for much of this type of equipment, the depreciation period is 5 years so the tax write off in the early years is generally less than in the wholesale industry.

The mean ratings given by all decision makers also indicate that the ACRS and the ITC are viewed with very similar relative importance within each industry. The importance ratings given to factors D and E (ITC and ACRS) by the decision makers in wholesale were 5.375 and 5.208 respectively. The ratings in the mining industry were 2.25 for both factors D and E. This similarity was consistent for every industry.

The decision makers' viewed importance of tax incentives indicated in the responses to question three was also supported by the responses to question four.

Question Four

In viewing the above listed factors, please rank order the factors in the order of importance that you believe is placed on each factor in your company's capital investment decision making for new equipment.

Your Rank Order (Place the letters of the factors below.)

1. _____ Most Important
2. _____
3. _____
4. _____
5. _____
6. _____ Least Important

In ranking the six factors in their perceived order of importance, only one decision maker indicated that factor D was the most important and only one other indicated that factor E was the most important. Ten said that factor D was the least important and fifty-six that factor E was the least important.

The number of respondents who ranked the factors in the order of importance from 1 (Most Important) to 6 (Least Important) is summarized for the total respondents (N=102) in Table 4-9.

Table 4-9
Ranked Importance of Certain Decision Factors

	A	B	C	D	E	F
Most						
Important						
1	20	39	17	1	1	24
2	24	22	26	3	2	25
3	16	19	28	7	5	27
4	21	12	13	26	10	20
5	5	5	9	55	28	0
6	16	5	9	10	56	6
Least						
Important						
N	102	102	102	102	102	102

A review of the responses given by the total respondents to both questions three and four shows that the viewed importance of the six factors may be ranked as follows:

Factor

Most Important	B	Anticipated Increases in Sales
	F	Improvement of Productivity
	C	Replacement of Worn Out Equipment
	A	Availability and Cost of Financing
	D	Investment Tax Credit
Least Important	E	Accelerated Cost Recovery System

Question Five

How do you expect the sales of your company's products or services to change over the next twelve months? Please check one:

_____ Increase - By approximately what percentage_____

_____ Remain approximately unchanged

_____ Decrease - By approximately what percentage_____

Seventy five of the investment decision makers expected the sales of their company's products or services to increase over the next twelve months; twenty-two to remain approximately unchanged; and five to decrease.

Table 4-10

Expected Changes in Sales

Expected Change in Sales	Number of Respondents	Response Frequency	Mean Change Expected
Increase	75	73.5%	+28%
Remain Unchanged	22	21.6%	0%
Decrease	5	4.9%	-27%
Total	102	100%	+19.324%

Question Six

By what percentage could your firm's present sales increase without requiring additional investment in new equipment?

The decision maker's responses to this question ranged from a low of 0% to a high of 800%. The median was 25.4%. The mode was 25%.

Each decision maker's response to this question was used as the base in determining the firm's NExC. As can be seen in Table 4-11, numerous respondents reported very high amounts of unused sales potential.

Table 4-11
Present Unused Sales Potential

Present Unused Sales Potential	Number of Responses	Relative Frequency	Cumulative Frequency
0 - 10%	18	17.6%	17.6%
11 - 20%	18	17.6%	35.3%
21 - 30%	22	21.7%	56.9%
31 - 40%	9	8.8%	65.7%
41 - 50%	8	7.8%	73.5%
51 - 75%	8	7.8%	81.4%
76 -100%	7	6.8%	88.2%
101 -200%	6	5.9%	94.1%
201 -500%	5	4.9%	99%
501 -800%	1	1.0%	100%
Total	102	100%	100%

Question Seven

Under normal conditions, what percentage of surplus capacity do you normally like to maintain in order to meet any unexpected increases in the demand for your company's products or services?

The decision maker's responses to this question ranged from a low of 0% to a high of 30%. Almost half of the respondents reported they desired no surplus capacity. The reasons for this may include a relatively short lag time required to put assets in service and relatively stable company sales projections. Also, if there is little or no costs to the firm if it is unable to meet the demand for its products immediately, no surplus capacity would be desired. The mean desired surplus capacity expressed as a percentage of sales volume was 6.4%. Table 4-12 is a summary of the total responses to this question. Table 4-13 lists the mean responses according to SIC code.

The mean desired surplus capacities reported for in all industries surveyed were relatively close to each other, with the exception of the transportation, communications, and public utility industry. This is expected because of the greater time required to put new equipment in service for this industry. Firms in this group may take years to get new equipment on line, and therefore decision makers generally feel a need to maintain more surplus capacity.

Table 4-12

Normal Desired Surplus Capacity Expressed as a Percentage
of Sales

Desired Surplus	Number of Responses	Relative Frequency	Cumulative Frequency
0%	50	49%	49%
1-5%	9	8.8%	57.8%
6-10%	20	19.3%	77.5%
11-15%	10	9.8%	87.3%
16-20%	9	8.8%	96.1%
21-25%	3	2.9%	99%
26-30%	1	1%	100%

Table 4-13
Mean Desired Surplus by SIC Code

	Mean Desired Surplus	N
Mining	6.25%	4
Construction	6.45%	20
Manufacturing	6.00%	37
Transportation, Comm., Pub. Util.	12.00%	5
Wholesale	5.7%	24
Retail	7.0%	12
Total	6.4%	102

Question Eight

In your company, if a decision is made to expand your firm's maximum operating capacity, approximately how long would it normally take from the decision to expand until actually being able to increase your firm's output capacity?

_____	less than 6 months
_____	6 months to one year
_____	one to two years
_____	two to five years
_____	over five years

In responding to this question, 61.8% of the decision makers indicated that their companies could expand their maximum operating capacity in less than 6 months, 90.2% indicated that expansion would take less than one year. Only two reported a period longer than two years. Both of these were in the transportation, communication, and public utilities industry. Table 4-14 is a summary of the total responses to this question.

Being able to expand output capacity in a relatively short period of time would reduce the decision makers' need to maintain surplus capacity. They could also delay any plans for the purchase of new business equipment until the firm was operating at or very near full existing capacity.

Table 4-14

Lag Time

Time Needed to Expand Maximum Output Capacity	Number	Relative Frequency	Cumulative Frequency
less than 6 months	63	61.8%	61.8%
6 months to 1 year	29	28.4%	90.2%
1 to 2 years	8	7.8%	98%
2 to 5 years	1	1%	99%
over 5 years	1	1%	100%

Question Nine

Do you anticipate that there will be an increase in the number of persons employed by your company in the next 12 months?

_____yes _____no.

If yes, by what percentage will the number of employees increase? _____

Seventy decision makers responded "yes." The mean expected increase in employment for the next 12 months for all "yes" answers was 17.5%. Table 4-15 shows the number and relative frequency of responses.

Table 4-15
Expected Change in Employment

% Expected Change in Employment Based Upon Present Number of Employees	Number	Relative Frequency
< 0%	2	2%
0%	30	29.4%
1-10%	47	46%
11-20%	11	10.8%
21-30%	4	3.9%
31-40%	1	1%
41-50%	1	1%
51-60%	1	1%
61-70%	0	0%
71-80%	2	2%
81-90%	0	0%
91-100%	3	2.9%
	N = <u>102</u>	<u>100%</u>

Based on Table 4-15, the majority of decision makers surveyed are optimistic about additional employment over the next 12 months.

Table 4-16 is a summary of the mean expected sales increase, unused sales potential, desired surplus capacity, net excess capacity, and tax incentive importance rating by industry of decision makers.

Table 4-16

Mean Responses by Industry of Decision Makers

	Mining (N=4)	Construction (N=20)	Manufacturing (N=37)	Transportation (N=5)	Wholesale (N=24)	Retail (N=12)
Expected Sales Increase for the next 12 months	11.3%	13%	30.0%	.8%	13.1%	18.5%
Unused Sales Potential	117.5%	64.2%	79.7%	31.2%	62.5%	41.6%
Desired Surplus Capacity	6.3%	6.5%	6.0%	12%	5.7%	7.0%
Net Excess Capacity	100%	44.8%	43.7%	18.4%	43.6%	16.1%
Tax Incentive Importance Rating	2.3	3.9	4.2	4.2	5.3	4.8

In reviewing the mean responses by industry, we find that mining had the highest reported NExC. This industry was well outside the approximate area where tax incentives are expected to be most important to decision makers. The mean tax incentive importance rating of only 2.3 was expected for this industry.

The decision makers in the wholesale industry reported a NExC of 43.6%. This also is outside the approximate area where tax incentives are expected to be important. The decision makers in the wholesale industry, however, reported the highest tax incentive importance ratings of any surveyed. This may be due to the type of assets used by this industry.

The only industry with a reported NExC inside the approximate area where tax incentives are expected to be most important was the retail industry (NExC=16.1%). The decision makers in retail businesses had a mean tax incentive importance rating of 4.8. This was the second highest of any industry.

STATISTICAL ANALYSIS AND FINDINGS OF THE STUDY

The alternate hypothesis being tested in this study, which were previously stated, are:

Ho: There is no difference in perceptions of the importance of investment tax incentives in investment decision making between decision makers in firms operating near full output capacity and those in all other firms.

Ha: Investment decision makers in firms operating near full output capacity view investment tax incentives as more important than do all other business investment decision makers.

Discussion of the t test

As previously stated, for the statistical analysis using the t test, Group A (N=36) consisted of decision makers in firms operating with $0 > NExC < 17\%$. Group B consisted of all others (N=66). A t test was performed on the responses given by the decision makers in firms with $NExC < 0$ and those in firms with $NExC > 17\%$. From this analysis, we can conclude that there is no statistical difference in the viewed importance of tax incentives by the decision makers who were combined to form Group B.

The statistical analysis using the t test indicates that a modest difference between the viewed importance of tax incentives among the members of Group A and Group B exists at the .04 level of significance (with 100 degrees of freedom). The probability of obtaining a difference equal

to or greater than the one observed when in fact no difference exists is less than .05, the level of significance selected for this study. Rejection of the null hypothesis (H₀) is warranted and the alternative hypothesis (H_A) is accepted. The t test indicates that Group A views the importance of tax incentives more highly than Group B. However, the amount of increased importance on the part of Group A over Group B is very modest. The mean importance rating for Group A is 4.97; that for Group B is 4.04.

Discussion of the Pearson Correlation Analysis

A Pearson correlation analysis was performed on two groups of decision makers. The high NExC group included decision makers in firms with NExC greater than 8.5 and less than 100% (N=49). The low or no NExC group included decision makers in firms with NExC less than 8.5% and greater than -100% (N=39). The dividing line of 8.5% is the center of the approximate area where investment tax incentives are believed to be more important to investment decision makers. The high NExC group was limited to decision makers in firms with NExC < 100%. Also, the low or no NExC group was limited to firms with NExC > -100%. The elimination of the extreme cases from each group was performed to reduce any possible distortion of the findings

of this analysis caused by these cases. The rating scale used here allowed for a rating of from 1 to 10. The decision makers in firms located at the extremes could not rate a factor less than 1 on the importance scale. Even a rating of 1 with a NExC greater than 100% may give a false indication of association between the variables.

The Pearson correlation analysis procedure using the group with high NExC (N=49) shows a negative association between the dependent and independent variables ($r = -.3006$) ($p = .018$).¹² The r value of $-.3006$ shows that .09 of the variation in the dependent variable is explained by the independent variable. As the NExC of the firm increases away from NExC = 8.5%, the viewed importance of investment tax incentives by the decision makers in these firms decreases. From the results of the Pearson correlation analysis on this group, we can conclude that the probability $r = 0$ is only .018.

The Pearson correlation analysis procedure using the group with low or no NExC (N=39) shows a positive association between the dependent and independent variables ($r = .2793$) ($p = .045$). The r value of .2793 shows that .078 of the variation in the dependent variable is explained by the independent variable. As the NExC of the firms in

¹² p is the level of significance of the correlation analysis findings.

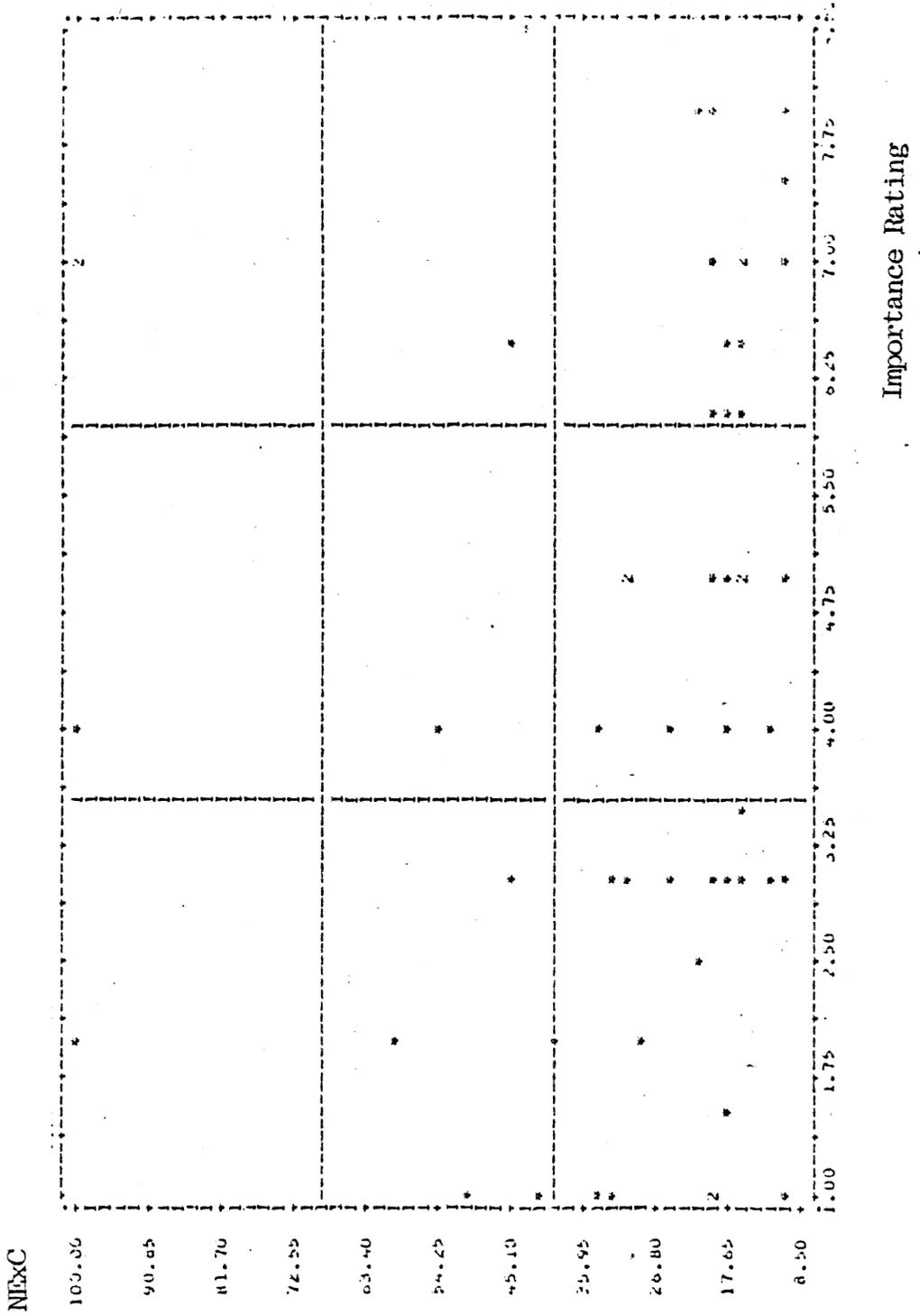
this group increases towards a NExC = 8.5%, the viewed importance of tax incentives by the decision makers in these firms increases. From the results of the Pearson correlation analysis on this group, we can conclude that the probability $r = 0$ is only .045.

Overall, the results of these two analysis show that as the NExC of the firm moves closer to the line separating the two groups, the decision makers' viewed importance of tax incentives increases. The association of NExC with the viewed importance of tax incentives by the decision makers in the two groups is statistically significant at the .05 level of significance. However, the change in the viewed importance of tax incentives associated with NExC is very modest.

Figures 4-1 and 4-2 are scattergrams for each group, respectively, with each decision maker's tax incentive importance rating plotted on the graph according to the firm's NExC. The scattergrams shows a high variability between NExC and the tax incentive importance ratings. Some of the lowest tax incentive ratings occur within the area $0 > \text{NExC} < 17\%$ and some of the highest ratings occur outside of this area. Thus, in spite of the fact that the Pearson correlation analysis portrays a modest association between NExC and the viewed importance of tax incentives, the scattergrams point out a high amount of variability.

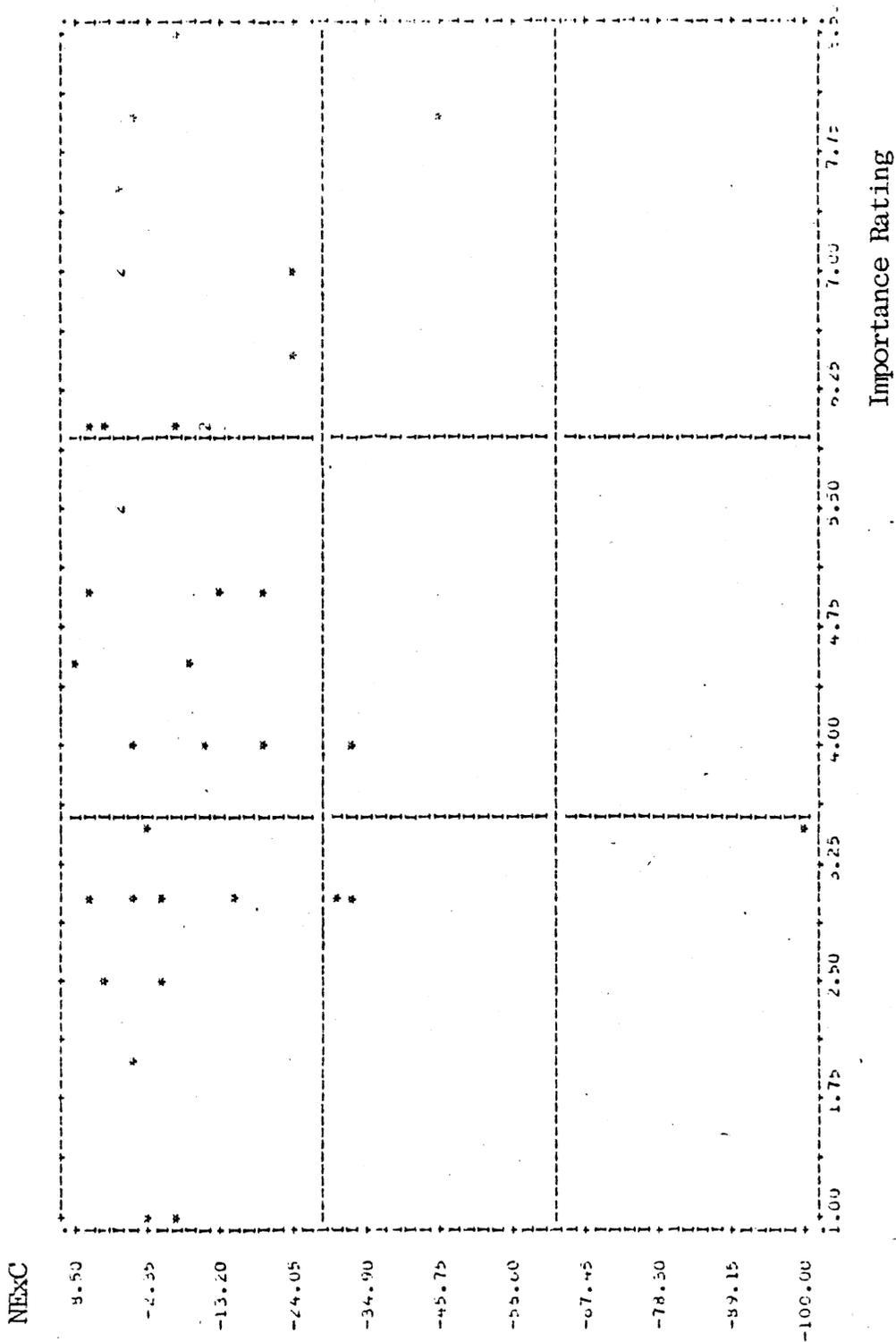
Graph 4-1

Scattergram of High NEXC Group



Graph 4-2

Scattergram of Low and Negative NEXC Group



Chapter V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

INTRODUCTION

The current Federal tax laws of the United States include numerous credits, subsidies, and special provisions aimed at motivating business decision makers into certain courses of action. Public policy makers assume that the tax credits, subsidies, and special provisions influence these decision makers in the intended manner. The Reagan Administration's attempt to revitalize the American economy by using tax incentives is a recent example of strong faith in their impacts.

Still, a substantial amount of uncertainty exists about the actual impacts that such tax incentives have on business decision making and the types of environments where they will or will not influence the behavior of business decision makers. This study has been an attempt to determine if certain business conditions provide an environment where tax incentives are viewed more importantly by decision makers in their investment analysis.

TESTING THE HYPOTHESIS

The following hypotheses were tested in this study:

Ho: There is no difference in perceptions of the importance of investment tax incentives in investment decision making between decision makers in firms operating near full output capacity and those in all other firms.

Ha: Investment decision makers in firms operating near full output capacity view investment tax incentives as more important than do all other business investment decision makers.

To test the above hypothesis, we placed decision makers into groups based upon the NExC of their firm. Those with values between 0 and 17% were compared with those in all other firms (for the t test analysis). The central value of 8.5% of this group was used to divide the decision makers for the Pearson correlation analysis.

The t Test

The statistical analysis of the means of the two groups using the t test procedure indicates that a modest difference between the means of the two groups exists at the .05 level of significance. The t test indicates that the group of decision makers in firms operating with NExC between 0 and 17% did view the importance of tax incentives higher than the other decision makers. Rejection of the null hypothesis is warranted and the alternative hypothesis is accepted.

Even though the t test showed that respondents in firms operating with NExC between 0 and 17% viewed the investment tax incentives as more important than did the others, the decision makers at every level of NExC and across every industry tested viewed the importance of all other factors more highly than the tax incentives.

The Pearson correlation analysis

The Pearson correlation analysis showed that as the firm's NExC moved away from 8.5% in either direction, the viewed importance of the tax incentives decreased. The results for both groups were statistically significant at the .05 level. The actual change in the viewed importance of tax incentives, however, was very modest and highly variable.

IMPLICATIONS FOR FEDERAL TAX POLICY

The results of this study suggest that the business conditions where decision makers view the importance of investment tax incentive highest appear to be where firms are operating relatively close to full output capacity. Even then, however, decision makers view the importance of tax incentives as only moderate. Other decision factors included in this study were viewed substantially more

important at every level of NExC tested and by the decision makers across every major industry included in this study.

These people particularly stressed anticipated increases in sales as the most important factor influencing their investment decision making for new equipment. This indicates that public policy makers are more likely to stimulate business investment activity with tax policy aimed at generating additional demand for products and services than with investment tax incentives. This type of tax policy would include across the board individual and business tax reductions rather than the ITC and ACRS. Indirectly, the ITC and ACRS may increase demand by providing business firms with additional after tax profits which are passed along to stockholders and eventually spent. However, across the board tax cuts appear to be more likely to influence the demand for products and services and thus increases business investment activity. As one decision maker interviewed in this study commented, "investment tax incentives won't cause us to buy new equipment unless customers are buying the products produced by the equipment."

Another implication of this study for Federal tax policy is the finding on the attention impact of the tax incentives. Less than half of the top level decision makers

interviewed (48 out of 102) said that the business investment tax incentives attracted their attention to the possibility of new capital investments. This shows that many of the firms claiming credits for the ITC and ACRS on their tax returns are not motivated by the tax incentives in the intended manner, but claim the deduction after the fact.

The results of this study have implications pertaining to the use of such incentives as a means of stimulating a depressed economy. The decision makers in firms with relatively high amounts of NEXC viewed the importance of tax incentives lower than the other decision makers. This suggests that during a period of an economic recession, the business environmental conditions are such that investment tax incentives will have the lowest impact on business investment decision making. During economic recessions, business firms experience increasing amounts of NEXC in their operations. The impact of investment tax incentives on investment decision making in general may be considered moderate; during an economic recession, the impact of investment tax incentives as a means to stimulate business investment activity is less.

Public policy makers need to recognize the limited strength of business investment tax incentives as part of a total fiscal and monetary strategy for economic

revitalization. This study indicates that business investment tax incentives are more likely to achieve their intended results when firms are operating relatively close to full output capacity. However, even under these business conditions, the effect of business investment tax incentives on the investment decision making process may be considered moderate, highly variable, and secondary to numerous other factors.

LIMITATIONS OF THE STUDY

The business investment decision makers surveyed in this study were selected only from within the State of Virginia and from only firms listed in the 50,000 Leading U.S. Corporations (1980). No nationwide validation of the results was planned to determine if decision makers in Virginia are representative of those across the nation. The generalization of the findings of this study to all businesses may be suspect. However, there is no basis for assuming that decision makers in Virginia view the factors included in their investment decision making process any differently than those elsewhere in the country. A strong attempt was made to obtain a random sample in each of the major industries. However, any differences between this sample and the total population may be due to the nonrandomness of the actual sample.

Firms listed in the 50,000 Leading U.S. Corporations include the Fortune 500 companies and those listed in Standard and Poors but are not representative of the relatively small businesses. The firms included in the 50,000 Leading U.S. Corporations account for up to 90% of sales volume in their respective standard industrial classification. In this respect, the firms of the decision makers in this study may be considered representative of the majority in their class with the exception, as noted. Also, only firms in certain industrial classifications were surveyed. This study did not include Agriculture, Finance, Insurance, Real Estate, and the Services industries.

Another limitation of this research project is that data provided by decision makers were based upon their perceptions of their business operation and environment. Actual records were not accessed (if in fact they existed at all). There is also no confirmation of what the decision makers reported and their actual actions. The decision makers were asked to provide the information based upon personal estimates from experience. The respondents consisted primarily of chief executive officers, presidents, and vice presidents. These personal estimates should be viewed with a relatively high degree of reliability. There is no reason to believe that the decision makers would act differently in their decision making than reported.

Finally, this study does not attempt to quantify the actual amount of business investment that the investment tax incentives or other factors may actually generate, nor the amount of windfall benefits to the firms. Nor does it claim to identify the exact levels of net excess capacity where tax incentives will or will not influence investment decision making. Recognizing that the factors included in the business investment decision making process are numerous, and subject to each decision maker's own business environment and interpretation, it is felt that accurately quantifying the dollar impact that any one factor or group of factors have on business investment activity is virtually impossible except at the individual level of the firm and then only for a specific investment decision. It is also felt that the identification of exactly when and where tax incentives will or will not influence investment decision making may be accomplished only at the individual level of the firm for one point in time. This study has attempted to identify only the general overall business environmental conditions likely to influence the viewed importance of investment tax incentives by decision makers in their purchase of business equipment.

NEED FOR FURTHER RESEARCH

Public policy makers cling to the basic assumption that business investment tax incentives, as well as numerous other tax subsidies, influence decision makers in the intended manner. Despite all the faith in the use of tax incentives as a means of stimulating business investment, there has been a lack of consensus on the part of researchers pertaining to their effectiveness. This researcher expects that the debate concerning the impact of such on business decision makers will continue.

Additional research is warranted on this impact as well as that of numerous other business tax credits and subsidies. It is believed that this future research should include the key business environmental factors that directly affect the profitability of decisions. The effectiveness of Federal tax policy as a means of stimulating business decision makers may be enhanced, by finding out more about the types of environments where tax incentives are most likely to work or not work.

REFERENCES CITED

- Bozeman, Barry and Albert Link, "Tax Incentives for R & D: Some Notes of Caution," Paper prepared for presentation at the Fourth Annual Research Conference of the Association for Public Policy Analysis and Management, Minneapolis, Minnesota, October 28-30, 1982.
- Brimmer, Andrew, and Allen Sina, "Effects of Tax Policy on Capital Formation, Corporate Liquidity and the Availability of Investment Funds." Journal of Finance, May, 1976, pp. 287-312.
- Business Week, November 8, 1982, "How to get the economy growing again: The Search for a New Policy," pp. 108-112.
- Capital Spending Check Up and Financing Survey, Economics Department, McGraw-Hill Publications Company, New York, N.Y., March 12, 1982.
- Clouse, J., "Research and Development, Investment Tax Incentives, and Enlightened Ignorance," Tax Notes, September 29, 1981, pp. 603-610.
- Coen, Robert M., "The Effects of Tax Policy on Investment in Manufacturing," American Economic Review, Vol. 58 (May 1968) pp. 200-211.
- Crumbly, Larry. "Behavioral Implications of Taxation." Accounting Review, October, 1973, pp. 759-763.
- Data Resources U.S. Long Term Bulletin, Data Resources Incorporated, Lexington, Mass., September, 1982.
- Economic Indicators, August, 1982, Prepared for the Joint Economic Committee by the Council of Economic Advisors, U.S. Government Printing Office, Washington, D.C., 1982.
- Eisner, Robert and Patrick Lawler, "Tax Policy and Investment: An Analysis of Survey Responses." American Economic Review, March 1975, pp. 206-12.
- Emory, C. William, Business Research Methods, Irwin, Homewood, Illinois, 1980, p. 444.
- Federal Tax Course 1982, Prentice-Hall, Englewood Cliffs, N.J., 1981.

- Ferguson, George A., Statistical Analysis In Psychology and Education, 4th Edition, McGraw Hill, New York, N.Y., 1976, pp. 160-163.
- 50,000 Leading U.S. Corporations, Baldwin H. Ward Publications, Petaluma, California, 1980.
- Foster, Cecil Glenn, "An Empirical Analysis of the Potential Differential Impact of the Investment Tax Credit on Investment in Capital Goods," Doctoral Dissertation, University of Georgia, 1981.
- Fromm, Gary, Tax Incentives and Capital Spending, the Brookings Institute, Washington, D.C., 1967.
- Galbraith, John K., The Affluent Society, Houghton-Mifflin Company, Boston, Mass., 1976, pp. xvii-xviii.
- Hall, Robert and Dale Jorgenson, "The Policy and Investment Behaviors." American Economic Review, June, 1967, pp. 391-414.
- Hall, Robert E. and Dale W. Jorgenson, "Applications of Theory of Optional Capital Accumulation," in Gary Fromm Tax Incentives and Capital Spending Washington, D.C.: the Brookings Institute, 1971, pp. 9-60.
- Holzman, Robert S., Tax Basis for Managerial Decisions, Holt, Rinehart and Winston, New York, New York, 1965.
- Investment Tax Credit: Unresolved Issues, Report by the Comptroller General of the United States, General Accounting Office, Washington, D.C., May 8, 1978.
- Kimmel, Lewis H., Taxes and Economic Incentives, the Brookings Institute, Washington, D.C., May 1950.
- March, James A., and Simon, Herbert, Organizations, Wiley and Sons, Inc., New York, 1958.
- O'Neil, Cherie Jeanne, "The Impact of the Targeted Jobs Credit on the Employment Decision Process," Doctoral Dissertation, University of Colorado, 1980.
- O'Neil, Cherie Jeanne, "The Impact of the Targeted-Jobs Credit on the Employment Decision Process," Journal of American Taxation Association, Winter, 1982.
- Peachman, Joseph A., Federal Tax Policy, The Brookings Institute, Washington, D.C., 1977.

Perrow, Charles, Complex Organizations, Scott, Foreman and Company, Glenview, Illinois, 1979.

Planning Under the 1981 Economic Recovery Tax Act, Touche Ross and Co., New York, N.Y., 1981.

Reese, Thomas J., The Politics of Taxation, Quorum Books, Westport, Connecticut, 1980.

Regan, Donald T., "A More Rational Tax Policy," address presented at the Proceedings of the Continental Bank Conferences on Taxation, Chicago, Illinois, December 4, 1979, pp. 36-38.

Rosenblatt, Robert A., "Industries not Reacting to Tax Cuts," LA Times-Washington Post Service in Roanoke Times and World News, Roanoke, Virginia, July 18, 1982.

Samuelson, Paul A., Economics, McGraw-Hill, Inc., New York, N.Y., 1976, pp. 59-62.

Samuelson, Paul A., "The New Look in Tax and Fiscal Policy," in Warren L. Smith and Ronald L. Teigen, Readings in Money, National Income and Stabilization Policy, (Irwin, Homewood, Illinois, 1965), pp. 334-355.

Smith, Dan Throup, Tax Factors in Business Decision Making, Prentice-Hall Inc., Englewood Cliffs, N.J., 1968.

Statistical Abstract of the United States (1982) Published by the U.S. Bureau of the Census, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., 1983.

Surrey, Stanley S., Our Troubled Tax Policy: False Routes and Proper Paths to Change, Special Report Published by the Taxation with Representation Fund, Washington, D.C., 1981.

Surrey, Stanley S., The Pathways to Tax Reform, Cambridge, Massachusetts: Harvard University Press, 1973.

Surrey, Stanley, "Tax Subsidies as a Device for Implementing Governemnt Policy," Tax Advisor, April, 1972, pp. 196-204.

The Annual Report of the Council of Economic Advisors, U.S. Government Printing Office, Washington, D.C., January 1963, pp. 45-51.

Thompson, J.D., Organization in Action, McGraw-Hill Book Company, New York, N.Y., 1967.

U.S. Bureau of Labor Statistics, Employment and Earnings, April, 1983.

U.S. Congress (1981), Economic Recovery Tax Act of 1981 [P.L. 97-34], 97th Congress, 1st Session, August 13, 1981.

Weston, J. Fred and Eugene F. Brigham, Essentials of Managerial Finance, The Dryden Press, New York, N.Y., 1982, pp. 280-307.

Appendix A

DEFINITION OF TERMS

Certain business terms may have different intended meanings depending upon the context in which they are used. To clarify the intended usage, I have defined the following terms as they are used in this study:

1. Capital is property used in conducting a business operation other than inventories held for sale. Capital includes buildings, land, equipment, machinery and other assets needed to carry on the business operation.
2. Business Capital Investment is the expenditure of funds for the purchase or long term lease of property used in conducting a business operation.
3. Depreciation is a general term covering the loss of value of business capital assets caused by usage. Depreciation expense is the tax deductible loss of value of business capital assets.
4. Cost Recovery System is the method for computing the tax deductible expense of using a capital asset over its estimated useful life. The Accelerated Cost Recovery System (1981) permits business owners to take greater amounts of depreciation expense during

the early years in the life of an asset, thereby, deferring some of their income taxes until later years. Depreciation expense reduces the taxable income of the business.

5. Full Operating Capacity (FOC) is the total volume of goods and services that a firm could produce if its present capital assets were used to their fullest extent.
6. Current Capacity (CC) is the actual volume of goods and services that a firm is producing expressed as a percentage of full operating capacity.
7. Desired Surplus Capacity (DSC) is the amount of intentional slack maintained by the firm in its operation to meet unexpected increases in product demand. Desired surplus capacity may include equipment, machinery, or other assets.
8. Product Demand (PD) is the volume of products or services purchased by both business and individual customers over a particular time period.
9. Excess Capacity (ExC) is the volume of additional product demand expressed as a percentage of sales that could be met by the business firm without requiring additional investment in plant, equipment, or other capital assets less the desired surplus

capacity. Often in industry and in U.S. Government economic reports, the terms "excess capacity", "idle capacity", and "capacity utilization" are used to indicate the amount of unused capacity of business firms. In this respect, the terms indicate the percentage of full operating capacity that is not being used by the business firms. The formula for converting from "excess capacity" as used in this study to "capacity utilization" as indicated in U.S. Government economic reports is as follows:

$$\frac{1}{1 + (\text{ExC} + \text{DSC})} = \text{Capacity Utilization}$$

Capacity utilization is $\frac{\text{Current Capacity}}{\text{Full Operating Capacity}}$

10. Net Excess Capacity (NExC) is excess capacity minus the expected change in product demand over a particular time period.
11. Taxable Income is the adjusted gross income of the taxpayer that is subject to taxation.
12. Tax Liability is the actual tax that is due by the taxpayer.
13. A Tax Incentive is a provision in the tax law which allows a taxpayer to reduce his or her taxable income or tax liability by taking a certain action stated in the tax provision.

14. A Tax Credit is an allowance that directly reduces the tax liability of the taxpayer. The Investment Tax Credit allows business taxpayers to reduce their immediate tax liabilities by an amount up to 10% of the purchase price of capital assets purchased during the tax year. The investment tax credit is provided in the tax law to encourage business investment in new capital assets.
15. Time lag (Δt) is the time difference between the decision to invest in additional capital assets and the actual completion of the investment project whereby, the firm's full operating capacity is increased to a new level.
16. Importance is defined as the estimated value of each factor as an influence on the outcome of investment decisions.



Appendix B

PRE-APPROACH LETTER

I am an Assistant Professor of Business at Radford University in Radford, Virginia, and a Doctoral Candidate in Public Administration and Public Policy at Virginia Tech in Blacksburg, Virginia. I am presently conducting a study of the views of business decision makers on the important factors which influence their business investment decisions. Your company has been selected as one of the companies to be surveyed for this study.

I hope that you will take a few minutes when I telephone you in the next few days and share with me your views on your company's business capital investment decision making. A copy of the questions that I plan to ask you on the telephone is enclosed. If you wish, you may transfer my call to an appropriate person in your company to answer the questions for your company.

The questions pertain to your perceptions of the important factors considered in your company's capital investment decisions. Some of the questions are technical, but I do not expect you or the one you designate to research your company's records for answers. I would like for you or your designate to answer the questions based upon personal estimates from business experience. The information that you provide will be held in strict confidence. Your name and your company name are not included on the questionnaire. Only summary information by industry will be tabulated for use in this study. This study is important to me in that it will help me to complete the final stage of my Ph.D. program. This study may be important to you in that it may help to focus attention on appropriate public policy aimed at the revitalization of our nation's depressed business activity.

As my appreciation for your completing this questionnaire, I will be more than happy to send you a summary of the findings. Thank you in advance for your cooperation. My telephone call should not take more than ten minutes of your time.

Sincerely,

Clarence C. Rose
Assist. Professor of Business
Radford University, and
Ph.D. Candidate, Virginia Tech -

Enclosure

Appendix C

Business Capital Investment Survey

What is your job title? _____

What is the type of industry of your company? _____

How many employees does your company employ? _____

less than 100 _____

100 to 1000 _____

over 1000 _____

1. Over the past year, what were the most important factors considered by your company in making capital investment decisions for new business equipment?

2. Did the new accelerated cost recovery system and/or the more liberal investment tax credit included in the 1981 Economic Recovery Tax Act attract your attention to the possibility of new capital outlays for new business equipment for your company during this past year.

_____ yes _____ no

3. Based upon your company's capital expenditure decision making for new business equipment, how would you rate the following factors on a scale of 1 to 10 pertaining to their importance in your company's business investment decision making for new equipment? Please use the following scale in assigning points to the factors.

1	2	3	4	5	6	7	8	9	10
Not Important		Somewhat Important		Moderately Important		Very Important		Extremely Important	

- _____ A. The availability and cost of the funds needed for financing the purchase of new equipment _____.
- _____ B. Anticipated increases in sales for the products or services produced or supported by the new equipment _____.
- _____ C. The replacement of worn out equipment in order to maintain the firm's existing ability to produce _____.
- _____ D. A lower tax bill as a result of using the investment tax credit allowed for purchasing new equipment _____.
- _____ E. A lower tax bill as a result of using the 1981 accelerated cost recovery system when depreciating newly purchased business equipment _____.
- _____ F. The improvement of operating productivity and efficiency _____.

4. In viewing the above listed factors, please rank order the factors in the order of importance that you believe is placed on each factor in your company's capital investment decision making for new equipment.

Your Rank Order (Place the letters of the factors below.)

- 1. _____ Most Important
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____ Least Important

5. How do you expect the sales of your company's products or services to change over the next twelve months? Please check one:

_____ Increase - By approximately what percentage _____

_____ Remain approximately unchanged

_____ Decrease - By approximately what percentage _____

6. By what percentage could your firm's present sales increase without requiring additional investment in new equipment? _____

7. Under normal operating conditions, what percentage of surplus capacity do you normally like to maintain in order to meet any unexpected increases in the demand for your company's products or services?

8. In your company, if a decision is made to expand your firm's maximum operating capacity, approximately how long would it normally take from the decision to expand until actually being able to increase your firm's output capacity? _____

_____ less than 6 months

_____ 6 months to one year

_____ one to two years

_____ two to five years

_____ over five years

9. Do you anticipate that there will be an increase in the number of persons employed by your company in the next 12 months?

_____ yes _____ no

If yes, by what percentage will the number of employees increase? _____

Thank you for providing me with your responses to this survey. If you would like a summary copy of the results, please tell me when I call and I will be happy to send you one.



Appendix D
POST RESEARCH LETTER

Dear

Enclosed is a summary of the findings of my research project which you helped in by providing me with your perceptions of the important factors which influence business investment decisions for new business equipment. Thank you for taking time out of your busy schedule and sharing with me your views in this area. In reviewing the attached summary, if you have any questions or additional comments, please feel free to contact me.

Again, thank you for your participation in my research project.

Sincerely,

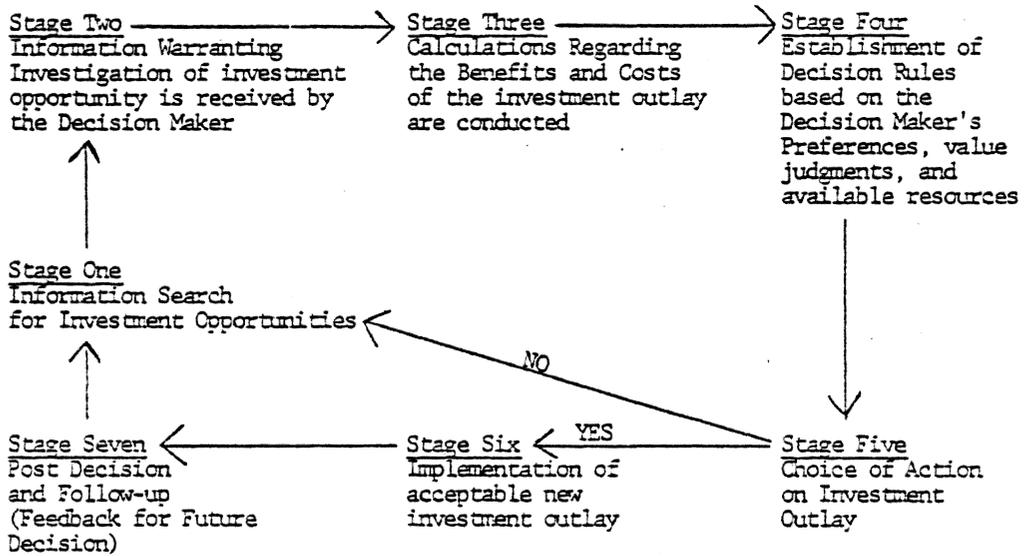
Clarence C. Rose
Assistant Professor of Business
Radford University and Ph.D. Candidate,
Virginia Tech

CCR/ca

Enclosure

Appendix E

Business Investment Decision Making Process



Appendix F

DATA USED IN STATISTICAL ANALYSIS

Appendix F1

Mean Summary Responses of Total Respondents

N=102

	Mean	Standard Deviation
Expected Sales Increase (over the next 12 months)	19.324%	37.691%
Excess Capacity (Base upon possible sales volume increase which could be met without requiring new business assets)	67.206%	117.116%
Desired Excess Capacity	6.441%	7.779%
Net Excess Capacity	41.4%	

Importance Ratings given by the Decision Makers to the
Business Investment Decision Making Factors on a Scale
of 1 to 10.

	<u>Mean</u>	<u>S. Deviation</u>
A. Availability & Cost of Funds	6.559	2.785
B. Anticipated Sales of Company	7.735	2.234
C. Replacement of Wornout Equip.	7.078	2.250
D. Investment Tax Credit	4.375	2.273
E. Accelerated Cost Recovery System	4.363	2.206
F. Improvement of Operating Product.	7.520	2.033

Appendix F2

Mean Summary Responses of Respondents with NExC<0

N=23

	Mean	Standard Deviation
Expected Sales Increase (over the next 12 months)	33.565%	52.292%
Excess Capacity (Based upon possible sale volume increase which could be met without requiring new business assets)	14.652%	17.826%
Desired Excess Capacity	10.739%	9.216%
Net Excess Capacity	29.7%	

Importance Ratings given by the Decision Makers to the
Business Investment Decision Making Factors on a Scale
of 1 to 10.

	<u>Mean</u>	<u>S. Deviation</u>
A. Availability and Costs of Funds	6.696	2.835
B. Anticipated Sales of Company	7.913	1.782
C. Replacement of Wornout Equip.	7.000	2.132
D. Investment Tax Credit	4.174	2.249
E. Accelerated Cost Recovery System	4.435	2.107
F. Improvement of Operating Product.	7.652	1.369

Appendix F3

Mean Summary Responses of Respondents with $0 > NExC < 17\%$

N=36

	Mean	Standard Deviation
Expected Sales Increase (over the next 12 months)	11.333%	13.121%
Excess Capacity (Based upon possible sales volume increase which could be met without requiring new business assets)	25.944%	17.073%
Desired Excess Capacity	5.250%	6.087%
Net Excess Capacity	9.4%	

Importance Ratings given by the Decision Makers to the
Business Investment Decision Making Factors on a Scale
of 1 to 10.

	<u>Mean</u>	<u>S. Deviation</u>
A. Availability and Cost of Funds	6.111	3.160
B. Anticipated Sales of Company	7.639	2.193
C. Replacement of Wornout Equip.	7.583	2.196
D. Investment Tax Credit	5.000	2.014
E. Accelerated Cost Recovery System	4.944	1.999
F. Improvement of Operating Product.	7.520	2.033

Appendix F4

Mean Summary Responses of Rspndents with NExC>17%

N=43

	Mean	Standard Deviation
Expected Sales Increase (over the next 12 months)	18.395%	40.911%
Excess Capacity (Based upon possible sales volume increase which could be met without requiring new business assets)	129.86%	159.95%
Desired Excess Capacity	5.140%	7.555%
Net Excess Capacity	106.3%	

Importance Ratings given by the Decision Makers to the
Business Investment Decision Making Factors on a Scale
of 1 to 10.

	<u>Mean</u>	<u>S. Deviation</u>
A. Availability and Cost of Funds	6.860	2.416
B. Anticipated Sales of Company	7.721	2.510
C. Replacement of Wornout Equip.	6.698	2.325
D. Investment Tax Credit	3.953	2.420
E. Accelerated Cost Recovery System	3.837	2.339
F. Improvement of Operating Product.	7.023	2.415

Appendix F5

Mean Summary Responses of Respondents in Mining

N=4

	Mean	Standard Deviation
Expected Sales Increase (over the next 12 months)	11.250%	27.801%
Excess Capacity (Based upon possible sales volume increase which could be met without requiring new business assets)	117.50%	108.05%
Desired Excess Capacity	6.250%	12.50%
Net Excess Capacity	100%	

Importance Ratings given by the Decision Makers to the
Business Investment Decision Making Factors on a Scale
of 1 to 10.

	<u>Mean</u>	<u>S. Deviation</u>
A. Availability and Cost of Funds	7.750	.50
B. Anticipated Sales of Company	6.000	3.742
C. Replacement of Wornout Equip.	7.250	2.062
D. Investment Tax Credit	2.250	.957
E. Accelerated Cost Recovery System	2.250	.957
F. Improvement of Operating Product.	8.000	3.367

Appendix F6

Mean Summary Responses of Respondents in Construction

N=20

	Mean	Standard Deviation
Expected Sales (over the next 12 months)	13.800%	28.953%
Excess Capacity (Based upon possible sales volume increase which could be met without requiring new business assets)	64.200%	98.277%
Desired Excess Capacity	6.450%	8.811%
Net Excess Capacity	43.9%	

Importance Ratings given by the Decision Makers to the
Business Investment Decision Making Factors on a Scale
of 1 to 10.

	<u>Mean</u>	<u>S. Deviation</u>
A. Availability and Cost of Funds	6.800	2.802
B. Anticipated Sales of Company	7.450	2.460
C. Replacement of Wornout Equip.	7.200	1.824
D. Investment Tax Credit	3.850	2.084
E. Accelerated Cost Recovery System	3.950	2.212
F. Improvement of Operating Product.	6.350	2.277

Appendix F7

Mean Summary Responses of Respondents in Manufacturing

N=27

	Mean	Standard Deviation
Expected Sales (over the next 12 months)	29.946%	54.782%
Excess Capacity (Based upon possible sales volume increase which could be met without requiring new business assets)	79.649%	153.322%
Desired Excess Capacity	6.000%	6.737%
Net Excess Capacity	43.7%	

Importance Ratings given by the Decision Makers to the
Business Investment Decision Making Factors on a Scale of
1 to 10.

	<u>Mean</u>	<u>S. Deviation</u>
A. Availability and Cost of Funds	6.297	2.807
B. Anticipated Sales of Company	7.865	2.175
C. Replacement of Wornout Equip.	7.054	2.494
D. Investment Tax Credit	4.162	2.279
E. Accelerated Cost Recovery System	4.135	2.238
F. Improvement of Operating Product.	7.784	2.057

Appendix F8

Mean Summary Responses of Respondents in Transportation,
Communications, and Other Public Utilities

N=5

	Mean	Standard Deviation
Expected Sales Increase (over the next 12 months)	.800%	1.789%
Excess Capacity (Based upon possible sales volume increase which could be met without requiring new business assets)	31.200%	18.377%
Desired Excess Capacity	12.000%	10.368%
Net Excess Capacity	18.4%	

Importance Ratings given by the Decision Makers to the
Business Investment Decision Making Factors on a Scale of
1 to 10.

	<u>Mean</u>	<u>S. Deviation</u>
A. Availability and Cost of Funds	7.000	2.739
B. Anticipated Sales of Company	6.000	2.449
C. Replacement of Wornout Equip.	8.200	.447
D. Investment Tax Credit	4.200	3.033
E. Accelerated Cost Recovery System	4.200	2.588
F. Improvement of Operating Product.	7.600	1.140

Appendix F9

Mean Summary Responses of Respondents in Wholesale

N=24

	Mean	Standard Deviation
Expected Sales Increase (over the next 12 months)	13.167%	12.356
Excess Capacity (Based upon possible sales volume increase which could be met without requiring new business assets)	62.458%	104.720%
Desired Excess Capacity	5.708%	6.937%
Net Excess Capacity	43.6%	

Importance Ratings given by the Decision Makers to the
Business Investment Decision Making Factors on a Scale of
1 to 10.

	Mean	<u>S. Deviation</u>
A. Availability and Cost of Funds	6.417	2.701
B. Anticipated Sales of Company	7.875	1.941
C. Replacement of Wornout Equip.	6.583	2.376
D. Investment Tax Credit	5.375	2.018
E. Accelerated Cost Recovery System	5.208	1.933
F. Improvement of Operating Product.	7.708	1.781

Appendix F10

Mean Summary Responses of Respondents in Retailing

N=12

	Mean	Standard Deviation
Expected Sales Increase (over the next 12 months)	18.500%	23.337%
Excess Capacity (Based upon possible sales volume increase which could be met without requiring new business assets)	41.583%	57.229%
Desired Excess Capacity	7.00%	8.623%
Net Excess Capacity	16.1%	

Importance Ratings given by the Decision Makers to the
Business Investment Decision Making Factors on a Scale of
1 to 10.

	<u>Mean</u>	<u>S. Deviation</u>
A. Availability and Cost of Funds	6.667	3.576
B. Anticipated Sales of Company	8.833	1.406
C. Replacement of Wornout Equip.	7.417	2.466
D. Investment Tax Credit	4.667	2.498
E. Accelerated Cost Recovery System	4.833	2.329
F. Improvement of Operating Product.	8.083	1.311

Appendix F11

Pearson Correlation Analysis Data Summaries on Groups Beta
and Chi

Group Beta (N=49) 8.5%>NExC<100%

r = -.3006

P = .018

Mean NExC = 23.939

Standard Dev. 12.704

Mean Tax Incentive Rating 4.2449

Standard Dev. 2.255

Group Chi (N=39) -100%>NExC<8.5%

r = .2793

P = .045

Mean NExC = -16.7105

Standard Dev. 43.56

Mean Tax Incentive Rating 4.618

Standard Dev. 2.0349

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