A TEST OF THE ENTREPRENEURIAL VS. MANAGERIAL HYPOTHESIS IN THE THEORY OF THE FIRM

Thesis for the Degree of Ph. D.

MICHIGAN STATE UNIVERSITY
ROBERT FRANCIS WARE

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This is to certify that the

thesis entitled

"A Test of The Entrepreneurial vs. The Managerial Hypothesis in the Theory of the Firm."

presented by

Robert F. Ware

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Economics

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Date April 25, 1972

ABSTRACT

A TEST OF THE ENTREPRENEURIAL VS.
MANAGERIAL HYPOTHESIS IN THE
THEORY OF THE FIRM

By

Robert Francis Ware

The major purpose of this study was to test systematically for differences in behavior between entrepreneurial firms and managerial firms. An entrepreneurial firm is defined as one operated strictly in the interest of its owners, and a managerial firm is defined as one operated generally in the manager's interests. This means that each type of firm will be maximizing a different objective function, which implies that differences in behavior will exist between them.

A static equilibrium model of an entrepreneurial firm was specified as having an objective function of maximizing stockholders' wealth. Maximization of the objective function yielded solutions for magnitudes of decision variables, which provided the basis for empirical hypotheses capable of discriminating between "entrepreneurial" and "managerial" behavior.

Several testable hypotheses were constructed by comparing the decision variables of the entrepreneurial firm specified in this study to the generalized theory of the managerial firm developed by other authors. A sample of firms was selected from the SIC industrial classification (20) containing food, flour, sugar, confectionary, and beverage firms. Firms were classified as either entrepreneurial or managerial on the basis of share ownership and the presence or absence of control.

The empirical results of this study indicated that managerial firms did tend to hold a larger quantity of external debt and, therefore, had a higher leverage ratio than did entrepreneurial firms. Generally, however, there appeared to be no significant difference between the stockholders' wealth of entrepreneurial firms and that of managerial firms.

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By

Robert Francis Ware

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Economics

1972

ACKNOWLEDGMENTS

I am indebted to many people who provided me assistance in the completion of this research. I am particularly indebted to the members of my thesis committee: Dr. Jesse S. Hixson, who provided initial discussions on the topic and contributed so many helpful suggestions throughout the entire project; Dr. Bruce T. Allen, who made many extremely helpful comments and continually offered me encouragement in the course of the research; and Professor Myles S. Delano, who so willingly agreed to read the final drafts and who contributed several insights into the financial aspects of the thesis.

I am also extremely grateful to Dr. David Pierce for the valuable suggestions on the empirical aspects of the research and for also providing me many formidable games of tennis, both of which were necessary inputs for the completion of the thesis.

Several drafts of the thesis were carefully typed by Mrs. Alicia Davies, to whom I am most grateful.

My wife, Margaret, made the most significant contribution to the completion of this thesis through

her great patience and encouragement during my years as a graduate student.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

THE PROBLEM AND THE APPROACH

Introduction

Neo-classical theory of the firm based on the concept of the owner-entrepreneurial utilizes the assumption that the objective of all firms is to maximize profit. This assumption implies that it is rational behavior for the owner-entrepreneur of either a perfectly competitive firm or a monopolistic firm to equate marginal revenue and marginal cost in producing and selling his output.

The validity of the profit-maximizing objective for imperfectly competitive firms has been questioned by many economists (2,8,11,19,21,24,30,31,34,36,38,48). It is generally argued that firms operating in a highly competitive industry have market forces imposed upon them that do not exist in an imperfectly competitive environment. These constraints will usually insure that firms will behave in a competitive manner which implies that they must maximize profit to survive in the long run. Firms operating under imperfectly competitive conditions, however, may not be subjected to these same market forces. Since the number of firms may be small, due to demand

conditions or barriers to entry, the exogenous pressure to pursue a goal of profit maximizing is greatly reduced. Scitovsky points out that in an imperfectly competitive environment an owner-entrepreneur may have the opportunity to maximize his satisfaction rather than profit (39). If the supply of entrepreneurship does not have a zero income elasticity, the owner-entrepreneur may prefer to reduce his work level and output below the firm's profit maximizing point in order to enjoy an increase in leisure time. A noncompetitive environment may also allow an owner-entrepreneur to pursue the goal of a "quiet life." As Hicks points out, "The best of all monopoly profits is the quiet life" (21:369).

The opportunity for discretionary behavior in an imperfectly competitive environment presents an additional problem for many corporations with multiple stockholders. In traditional theory, it is assumed the owner-entrepreneur makes all decisions in the firm affecting employment, output, and techniques of production. In many corporations, however, the owners are stockholders who, because of the widely dispersed share ownership, possess little or no effective control over the firms operating decisions. In these firms, the decisions are usually made by managers hired to operate the corporation in the best interests of the owners. Since there could exist a conflict of interest between the owners and managers, the possibility arises

that managers of the firm will be free to pursue objectives that are alien to the interests of the stockholders. Thus, it can be hypothesized that given a noncompetitive environment, separation of ownership and control may provide latitude for managerial discretion in the operation of the firm.

The problem of the separation of ownership and control in a corporation was first considered by Berle and Means in The Modern Corporation and Private Property (7). They point out that,

> It is traditional a corporation should be run for the benefit of its owners, the stockholders, and that to them should go any profits which are distributed. We now know, however, that a controlling group may hold the power to divert profits into their own pockets. There is no longer any certainty that a corporation will in fact be run primarily in the interests of the stockholders (7:333).

This analysis of the implications of separation of corporate ownership and control set the stage for many authors to propose changes in the neo-classical theory of the firm. Many of these changes have lead to the development of the theory of the managerial firm which will now be discussed and contrasted with the traditional theory of the entrepreneurial firm.

Managerial Motivation

An imperfectly competitive environment and a separation of ownership and control may allow a firm's

manager to pursue objectives which could conflict with the interests of the stockholders. Given this opportunity for discretionary behavior, managers may manipulate the firm in an attempt to achieve certain goals which will maximize their utility. Since a manager's utility is generally assumed to be a function of his salary, power, and status (16:271-316), managerial firms can be expected to pursue objectives which will have a positive effect upon these variables, leading in many cases to firm behavior which will conflict with the stockholders' welfare.

Alternative managerial objectives have been suggested by several authors. One such objective is W. J. Baumol's sales maximization hypothesis (2). Baumol maintains that managers operating oliogopolistic firms seek to maximize sales rather than profit. He states, "Even if size did not promote profits, personal self-interest could well induce the managers of a firm to seek to maximize sales. Executive salaries appear to be far more closely correlated with scale of operations of the firm than with its profitability: (2:46). This statement implies that since a manager's utility depends partially upon his salary, the maximization of sales rather than profit will provide a manager the means to a larger salary and therefore a greater utility (if salary is a function of sales). Additionally, Baumol maintains that a firm's large sales are a source of prestige for managers. A large increase in sales will

therefore have a much greater effect on the manager's utility than an increase in profit.

A second proposed objective of managerial discretion is the growth rate of the firm (31). R. Marris hypothesizes that ". . . managers are particularly concerned with the growth rate of the firm, subject to constraints on security" (31:186). He feels that since managers are interested in maximizing their own utility, they can do so by maximizing the size of the firm. Size, Marris maintains, explains a great deal of the inter-firm variance of executive compensation rates; a manager is therefore able to maximize his utility through maximizing the size of his firm. The maximization of the growth of the firm is subject to a "managerial security" constraint which is defined as the manager's fear of dismissal if the firm does not grow in a financially proper manner. This implies that a manager must be concerned with losing his position in the firm when pursuing the goal of maximum firm size.

Two other objectives of managerial discretion have been proposed by O. E. Williamson (48). He reasoned that since managers possessed the opportunity for discretion in their decision making, the firm's utility function should be extended to include certain expense components, which affect a manager's utility. Two types of expense components called "staff" and "emoluments" he feels are,

". . . incurred not merely for their contributions to productivity, but additionally for the manner in which they enhance the individual and collective objectives of managers" (48:33). Managers are assumed to have a positive expense preference for expanding the staff of an organization because it provides a means to be promoted, and in turn serves to increase both management salary and security within the firm. Managerial "emoluments," which represent that portion of management salaries that is discretionary, are assumed to be preferred by managers, not only because they are a source of material satisfaction, but also because they are an indirect source of status and prestige. Williamson includes in the firm's utility function a minimum profit constraint, which he defines as a "level of profit below which stockholders will actively intervene in the affairs of the firm." Any profit above this level is "discretionary," and will be consumed by the managers in order to fulfill their "needs and desires."

Additional examples of managerial discretion have been suggested by Machlup (30:21), but he does not specify their relationship to managerial utility. He feels that a manager's discretionary behavior could result in the maximization of a firm's market share, investment outlay, expense for research and development, retained earnings, expense accounts, and contributions to public interest and

patriotic causes. Presumably these variables will effect the utility of managers (relationship between utility and objectives unspecified) which in turn implies differences in behavior for managerial and entrepreneurial firms.

Entrepreneurial and Managerial Hypotheses

Since entrepreneurial and managerial firms will be examined in this study, alternative hypotheses concerning their behavior will be specified. The traditional entrepreneurial hypothesis states that firms will be operated to maximize the owners' welfare.[1] This implies that even though a firm may be operating in a noncompetitive environment, the managers pursue objectives which are strictly in the owners' interests. In contrast, the managerial hypothesis states that firms will pursue an objective that conflicts with the welfare of the owners. This generally means that given a noncompetitive environment and the separation of ownership and control, managers will pursue an objective which maximizes their utility rather than the owners'. In this case, specific manifestation of managerial discretion will become evident in the behavior of the firm.

Empirical Studies

As stated earlier, the problem of the entrepreneurial versus the managerial firm was first examined

[1]Owners' welfare will be defined in Chapter II.

in detail by Berle and Means (7). Their major concerns were with the increases in the concentration of economic power of large corporations, the dispersion of stock ownership in many of these large firms, and the ultimate effects that the separation of ownership and control may have on the behavior of firms. They classified the 200 largest nonfinancial corporations according to which individual or group controlled the majority on the Board of Directors of each firm. They used five categories in their classification scheme: management control, majority control, legal device, minority control, and private ownership. Corporations which appeared to be owned to the extent of 80 percent or more by an individual or group were classed as private, and firms in which greater than 20 percent but less than 50 percent of the stock was owned by a group of individuals were classed as majority controlled. They regarded firms controlled by holding companies and trusts as being in the legal device category. They drew the dividing line between minority and management control roughly at 20 percent, but found that none of the firms classed under management control had a dominant stock interest known to be greater than 5 percent of the voting stock. Using these five classifications, they found that in 1930, 40 percent were management controlled, 21 percent were controlled by legal device, 23 percent were minority stockholder controlled, 5 percent

were controlled by majority stockholders, and 6 percent were privately owned (7:94). Since the management control group represented nearly 50 percent of the 200 largest firms, the authors began speculating as to what the possible effects would be on firm behavior. They felt that since the stockholders' and managers' interests were in conflict, the firms would not be operated in the owners' best interest. They state,

> Suffice it here to realize that where the bulk of the profits of enterprise are scheduled to go to owners who are individuals other than those in control, the interests of the latter are as likely as not to be at variance with those of ownership and that the controlling group is in a position to serve its own interest (7:124).

Berle and Mean, however, did not attempt to test for differences in firm behavior, but only offered hypotheses concerning the effect of separation of ownership and control.

The Berle and Means study was recently updated in an article by R. J. Larner (26). He classified the 200 largest nonfinancial corporations in 1963, according to similar control categories that Berle and Means used but did no empirical tests. Even though he moved the dividing line between management and minority control down to 10 percent or more of the voting stock, he found that 84.5 percent of the firms fell under management control as compared to the 44 percent in 1930. He concluded that while Berle and Means were observing a "managerial

revolution" in process, now in 1963, that revolution seemed close to complete, at least within the range of the 200 largest nonfinancial corporations (26:786-787).

The Larner article laid the ground work for a study done by D. R. Kamerschen (23) that attempted to determine whether the extent of management control exerted an important influence on the rates of return of the 200 largest firms classified by Larner. He reasoned that management controlled firms would not be as interested in maximizing profits as owner controlled firms, and therefore managerial firms would have a lower profit rate than entrepreneurial firms. To test this hypothesis, he regressed average rate of return on invested capital onto a firm control variable, the change in firm control and additional variables such as change in firm size, concentration ratios, barriers to entry, sales revenue, and total firm assets. The results obtained by Kamerschen were inconclusive. The three management related variables were generally found to be statistically insignificant. Only one, the change in control variable, was statistically significant at the 5 percent level in the multiple regression analysis. He felt that since the change from owner to manager control between 1930 and 1963 helped to explain some of the rate of return in these firms, this was at "variance with the new nonprofit maximizing theories that stress nonpecuinary motives of managers."

One reason Kamerschen obtained such inconclusive results is that he failed to hold as many exogenous variables constant as possible. In order to isolate the control effect on a firm, either a sample of firms from within an industry must be used or exogenous variables affecting inter-industry firm behavior must be included in the statistical technique employed.

The empirical work by Williamson (48) in this study on discretionary behavior consisted mainly of observing firm behavior under conditions of "adversity." Williamson hypothesized that managerial firms would reduce the size of their staff by a larger amount than would a profit maximizing firm in response to a decrease in demand. He also hypothesized that a managerial firm would reduce expenditures on emoluments as demand for its product decreased, but this would not be visable for profit maximizing firms since emoluments are considered to be zero in their case. Using a field study technique, Williamson examined three firms under conditions of decreasing demand for their products. He found that the type and magnitude of the responses observed under these conditions were consistent with that predicated by his managerial discretion model. He observed firms reducing their fleets of airplanes, cutting travel expenses, and generally reducing emoluments available to managers. In one case, he found that the discretionary character of

excess funds were explicitly acknowledged by the company. The organizational bulletin stated, "Earnings that exceeded a target performance were available for discretionary purposes" (48:120).

R. Monsen, J. Chiu, and D. Cooley (33) attempted to detect whether separation of ownership and control affected the performance of the large firm. The authors assumed that the self-interest of managers in managerially-oriented firms lay in maximizing the managers' lifetime income. They additionally assumed that such self-interest was consistent with profit maximization only in special cases which allowed them to demonstrate empirically the impact of the separation of ownership and control on the performance of the firm. Their sample consisted of 72 firms from 12 different industries all of which were among the 500 largest industrial firms in the United States in 1963. The firms were chosen and classified as to whether they were owner or manager controlled, giving them 36 firms of each type. The mean ratios of net income to net worth for the 72 firms were analyzed by manager and owner control groups, by industry, and by year. The results showed a significant difference for the mean ratios between the owner and manager controlled firms, with the owner controlled firms achieving a 75 percent higher ratio. The effect of the type of industry on the net income to net worth ratio was also significant, but it was only

one-third the strength of the control type effect. No other effects, including control and industry interaction, were found to be significant. The authors concluded that owner controlled firms provide a much higher return on the original investment, and provide a better managed capital structure and more efficient allocation of the owners' resources. While the results do indicate that owner controlled firms may have a higher net income to net worth ratio, the authors attempt to isolate the control effect did not seem to be entirely successful. The industry effect was also significant which may indicate that a sample of owner and manager controlled firms within an industry may yield a better test of the hypothesis.

Baumol's sales maximization hypothesis was recently tested by Mabry and Siders (29), who attempted to determine whether sales maximization was the dominant objective of leaders of large business firms.[2] Their model predicted that profits could be positively correlated, negatively correlated, or have zero correlation with sales, since sales and profits would both be increasing until profits became a maximum, and then sales would be increasing while profits began to decrease. The empirical work did not support the models' predictions. They found that profits and sales of the firms in their sample were always positively correlated even when profits were at a

[2]Sales maximization is not necessarily inconsistent with wealth maximization.

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[2]Sales maximization is not necessarily inconsistent with wealth maximization.

maximum or falling. They additionally found that sales and selling and advertising expenses were positively correlated, but they did not feel that this supported the sales maximizing hypothesis, since it can also be consistent with profit maximization. In general, their results did not support sales maximization as a firm objective, but it appears that their technique may be incapable of discriminating among alternative hypotheses.

In another study by M. Hall (18) the sales maximization hypothesis was again examined. The basic hypothesis of Hall's model was "that if the goal of firms is sales revenue maximization then positive departures from the profit constraint should set in motion forces that will lead to increases in sales revenue" (18:145). Using a distributed lag model and multiple regression analysis, Hall found that there is no significant relationship between positive deviations from a profit constraint and an increase in sales revenue. He concluded from the statistical results that his findings lent no support to the sales revenue maximization hypothesis. Hall's technique in this study did not seem to be adequately equipped to differentiate between sales maximization and profit maximization. Since he assumed that sales maximizing firms would always increase output if they are operating above a certain profit constraint, he failed

to account for exogenous effects upon a firm's changing sales revenue.

Four other studies point to some additional factors which have a bearing on this thesis. The first is the research in which P. C. Dooley (12) examined the extent to which directors of corporations were interlocked with each other. He found that management controlled firms, where management control is measured by the proportion of officers on the board of directors, tend to avoid interlocks with other corporations. "The frequency of interlocks with other corporations declines as the proportion of active company officers (president, vice president, treasurer, etc.) on the board of directors increases" (12:317). This finding may indicate that managers are not interested in extending their control over additional firms, since there might be a possibility of losing the desirable position they now enjoy in one firm. By controlling several corporations, they may not be able to isolate themselves from exogenous forces which could seriously contract the manager's opportunity set.

The second article which bears on this thesis is Leinbenstein's "Allocative Efficiency vs. 'X-Efficiency'" (27). This article first examined some of the work done on the allocative inefficiency of monopoly and restrictions

gained by increasing allocative efficiency. This hypothesis supports the earlier discussion on the behavior of firms under less than highly competitive conditions. It was pointed out that if a manager were going to operate a firm in his own interest, the competitive environment in the industry must be imperfect so that the manager would have the freedom to make utility-maximizing decisions. If this condition did not exist, the firm's manager would be forced to behave as a profit-maximizer in order for the firm to survive in the long run.

An additional empirical study also supported Leibenstein's contention concerning "X-efficiency." J. Shelton (42) examined 22 separate franchised restaurants and found that when the restaurants were operated by a franchise-owner as opposed to a company manager, their profit performance improved considerably. While the sales of the restaurants were similar under both types of management, the profit margins (profit ÷ sales) for franchise-owner restaurants averaged 9.5 percent as compared to 1.8 percent for company managed restaurants. This evidence strongly indicates the importance of X-efficiency.

A study critical of the management control problem was authored by J. M. Chevalier (10). He reviewed the Berle and Means and the Larner studies, and concluded

that the generalizations about management control were highly debatable. His classifications of the same firms used in the previous studies yielded different results. He discovered that many financial concerns controlled much of the stock of these corporations through the operation of pension funds, and concluded that in many cases management control was overstated. He maintained that the control of a corporation is very difficult to determine. In some cases a stockholder might be able to take control by holding less than 5 percent of the voting stock while in other firms a much larger percentage might be required. He concluded that groups other than managers control firms much more frequently than the Berle and Means and Larner studies indicated. This points to the problem of the appropriate definition of management control. To insure an adequate test of the managerial versus owner control hypothesis, alternative definitions of management control should be employed to make sure that all dimensions of ownership are accounted for.

Methodology

The purpose of this study is to systematically determine whether firms which are "manager" controlled behave differentially from firms which are "owner" controlled. The managerial and entrepreneurial hypotheses stated earlier will be used as a basis for the study.

The entrepreneurial hypothesis states that firms will maximize only the owners' welfare, while the managerial hypothesis postulates that firms controlled by managers will pursue other objectives.

To test these hypotheses, a static equilibrium model of an entrepreneurial firm will be specified. This model will have an objective function reflecting an entrepreneurial hypothesis on firm behavior. Maximization of the objective function will yield solutions for magnitudes of decision variables which will provide the basis for empirical hypotheses capable of discriminating between "entrepreneurial" and "managerial" behavior.

The empirical procedure will involve one basic statistical approach. A sample of firms will be selected and classified as being either managerial or entrepreneurial firms. A cross sectional analysis will then be used to test for significant variation in dependent variables across the two samples of firms. Dependent variables will consist of firm decision variables derived from the theory of the entrepreneurial firm. Hypotheses concerning the dependent variables will be developed from a comparison of the theory of entrepreneurial and managerial firms. The testing of these hypotheses will then be accomplished through a multiple regression technique.

CHAPTER II

THEORY OF THE ENTREPRENEURIAL FIRM

Introduction

The entrepreneurial hypothesis, as described in Chapter I, states that a firm is operated to maximize the owners' welfare. In the theory of the entrepreneurial firm based upon the concept of the owner-entrepreneur, the owner's welfare is usually described as an exclusive function of the firm's profit. When considering firms which may have multiple owners the concept of the owner-entrepreneur no longer is appropriate, and owners' welfare generally cannot be described in this manner.

Since the stockholders of a multi-owned firm may not be directly concerned with maximizing profit, it can be expected that they will be interested in maximizing, in some form, their wealth holdings in the firm. The stockholder wealth holdings will be related to the firm's profit, but generally not dependent upon profit alone.

In this chapter, stockholders' wealth will be defined and a model of a multi-owned entrepreneurial firm will be specified that has an objective of maximizing the owners' wealth. The arguments of the owners' wealth

function will be determined by the concept of the firm which in turn will define the decision variables to be manipulated in pursuing this objective.

The Definition of Owners' Wealth: The Entrepreneurial Firm's Maximand

Since the owners' welfare cannot be represented directly by a firm's profit in a multi-owner organization, a definition of stockholders' wealth must be developed. In a firm with many owners, there are basically two sources of potential income for stockholders in any time period. The first is the dividends paid out by the firm during the time period, and the second are the funds the stockholders could receive if they liquidated the shares of the stock they owned in the firm. This means that during the time period, the potentially consumable wealth of the stockholders will be the total dividends they receive during the period, plus the market price per share of the stock in that period times the number of shares outstanding. Stockholders' wealth in time period "t" will then be given by

$$W_t = \Delta_t + V_t \cdot S_t \qquad [1]$$

where stockholders' potential wealth is "W_t", total dividends paid by the firm is "Δ_t", the price of the stock is "V_t", and the number of shares outstanding is

"S_t." This definition of wealth will be the maximand of the entrepreneurial firm specified in this chapter.

The Theory of the Entrepreneurial Firm

In a recent book by D. Vickers (44), a theoretical model was developed in which the objective of the firm was to maximize "the economic position of the owners." As interpreted by Vickers, this involved the maximization of the firm's expected profit net of interest payments.

Vickers' definition of stockholders' wealth differs from the one in this chapter in that he makes two assumptions concerning firm behavior and the stock market. He first assumes that the entire net profit a firm earns will be paid out in dividends, and secondly that the potential wealth represented by the shares of stock will be reflected in the present value of the firm's expected profit. His first assumption implies that a firm has achieved its optimal plant size with a given $\bar{K}$,[1] and it will not need to retain earnings to use as capital funds for financing purposes. His second assumption allows him to discount the stock value part of owners' potential

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[1]Vickers defines $\bar{K}$ (owners' equity) as the value of the firms' common stock plus any earned surplus (retained earnings) the firm may hold. When the firm has achieved its optimum position, given $\bar{K}$, this means that it will not need to increase either the common stock outstanding or the retained earnings. Since the optimal plant size has been achieved, the optimum quantity of money capital is being held by the firm.

wealth by implicitly assuming the value of the shares are reflected in the firm's profit.

Vickers' model will be used as a basis for the entrepreneurial firm model specified in this chapter. It will be assumed that the entrepreneurial firm is maximizing stockholders' wealth (W) which means that Vickers' maximand will be altered by dropping the two assumptions he made on firm behavior and the stock market. The dropping of his first assumption means that a firm will now be specified that is <u>not</u> in long-run equilibrium. This implies that the firm will need to retain a portion of the profit to help finance its movement toward the optimum long-run position. Additionally, this alteration means an entrepreneurial firm will be specified that is in short-run equilibrium making production and financial decisions that will lead to the optimal long-run position.

The following terms enter into the specification of the model of the entrepreneurial firm:

X = labor intensive input
Y = capital intensive input
Q = output = $Q(X,Y)$
P = price = $P(Q)$; $\frac{\partial P}{\partial Q} < 0$
R = total revenue = $[P(Q) \cdot Q(X,Y)]$
W_1 = unit factor cost of input X
W_2 = unit factor cost of input Y
D = total amount of debt employed in the firm
r = average rate of interest per annum payable on $D = r(D)$; $\frac{\partial r}{\partial D} > 0$, $\frac{\partial^2 r}{\partial D^2} \leq 0$
C = total cost = $(W_1X + W_2Y + r(D) \cdot D)$

π = net profit = R-C
ρ = retained earnings of the firm
K = value of common stock
$\overline{K}$ = K + ρ
G = working capital assets = g(Q); $\frac{\partial G}{\partial Q} > 0$
α = money capital coefficient of X
β = money capital coefficient of Y
M = total money capital

Since the firm is now assumed to retain earnings, dividends (Δ) are defined as net profit (π) minus retained earnings (ρ).

$$\Delta = \pi - \rho \qquad [2]$$

The portion of net profit retained by the firm for the period will provide one source of money capital (along with D and K) which can be used to finance its operations. Money capital is defined not as a factor of production, but as a pool of funds representing generalized purchasing power with which the firm can buy assets or factor services as in necessary for the operation of the firm (44:105). It is assumed that the firm's limited quantity of money capital acts as a constraint within which it must acquire the needed resources and make the necessary optimizing decisions in pursuing its objectives. This means the money capital (M) available to the firm consists of equity (K),[2] debt (D), and the quantity of retained earnings (ρ) held out of net profit during the period.

[2]K will be defined as only the value of the common stock outstanding. This means that retained earnings (ρ) has been separated from Vickers' $\overline{K}$ (i.e., $\overline{K}$ = K + ρ).

$$M = K + D + \rho \qquad [3]$$

It is additionally assumed that money capital must be allocated to three uses; working capital assets G (funds invested in cash, accounts receivable, and inventory), factor services of input X, and factor services or capacity of input Y (44:125). The working capital requirement (G) for money capital is assumed to be an increasing function of the firm's output:

$$G = g(Q), \frac{dG}{dQ} > 0 \qquad [4]$$

This means that as the firm increases its production and sales, it will need to invest a larger quantity of money capital in the liquid assets on its balance sheet.

The factors of production require an investment of money capital, which depends upon the capital intensity of the inputs in question. That is, some inputs may require a large investment of money capital to ensure the necessary capacity for producing the optimum output. The larger this capital investment is, the greater the money capital requirement for the input service will be. This implies that an additional cost is associated with each input; the direct cost per unit capacity of the input (W_i) plus the imputed cost of capital which is in each case dependent upon the estimated capital intensity of the input.

The money capital coefficients attached to inputs X and Y will depend upon the initial money capital outlay required for a certain input (M_x and M_y), and the number of units of capacity that the input produces (44:127).

$$\alpha = M_x/X, \text{ the money capital coefficient of X} \quad [5]$$

$$\beta = M_y/Y, \text{ the money capital coefficient of Y} \quad [6]$$

To determine the quantity of money capital required in a time period for each factor, the money capital requirement coefficient is multiplied by the number of units of each factor service needed to produce the firm's optimal output.

$$\alpha X + \beta Y = m, \text{ the money capital required for factors X and Y} \quad [7]$$

The total money capital requirement for the firm will now consist of the working capital requirement (g(Q)), and the requirements for the factor services need in production ($\alpha X + \beta Y = m$).

$$g(Q) + \alpha X + \beta Y = M, \text{ the firm's total money capital requirement.} \quad [8]$$

Substituting Equation 3 for M into Equation 8 allows for the specification of the money capital availability constraint in the following form:

$$g(Q) + \alpha X + \beta Y \leq \overline{K} + D + \rho \quad [9]$$

This constraint states that the total money capital investment in assets necessitated by working capital and factors of production cannot exceed the total amount of money capital available to the firm (44:135). If the constraint is binding, that is, if the total money capital is exhausted in these uses, the constraint would take the form:

$$\overline{K} + D + \rho - g(Q) - \alpha X - \beta Y = 0 \qquad [9a]$$

If the constraint is not binding the money capital requirements would be less than the total money capital available to the firm, and it would result in a case of capital saturation. Money capital in this case would not be a scarce resource and no cost would have to be imputed for its use.

The firm, in retaining a portion of the net profit for use as money capital, will also be constrained in its retention decision by the size of the net profit variable. It is assumed that net profit for the period will be divided between dividends and retained earnings so the constraint the firm must satisfy will take the following form:

$$\pi - \rho \geq \gamma \qquad [10]$$

This constraint states that retained earnings for the period cannot be larger than the firm's net profit or the

difference between the two will be equal to or greater than some γ (which by definition is the amount of the dividends).[3] Rearranging the constraint, it will be

$$\pi - \rho - \gamma = 0 \qquad [10a]$$

which shows that the use of net profit will be completely exhausted by retained earnings and dividends.

The dropping of Vickers' second assumption concerning the stock market means that the potential revenue represented by the value of the shares of stock will now be explicitly considered in the definition of stockholders' wealth. This means that the firm will have to pursue a strategy not only with respect to maximum profit, but also with respect to the price of stock in the market place. Stockholders' wealth in time period "t" was defined as

$$W_t = \Delta_t + V_t \cdot S_t \qquad [1a]$$

where V_t is the price of the stock and S_t is the number of shares outstanding.

The market price of a stock is determined by the supply and demand forces in the stock market. The supply of a particular stock is generally a function of the financial needs of a firm and will often be held constant

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[3] γ in this case may be ≥ 0, but it will be shown that it will be greater than zero.

(completely inelastic) over a period of time. Demand for stock is determined by several variables, some of which are exogenous to the firm's behavior. Such variables as the general level of economic activity, the political climate in the nation, and the international policy of the country all will have an effect upon the demand for stock in the marketplace. Firm variables such as earnings per share, dividends per share, retained earnings per share, sales, total assets, and the debt/equity ratio will also affect the demand for a stock in the market.

Since the market price of a stock is subject to a large number of forces, this model will assume that a modified reduced form equation determines the price of the stock for entrepreneurial firms. Thus, the price of the stock is assumed to be functionally dependent upon two variables; the dividends per share paid by the firm during the period ($\frac{\pi-\rho}{S}$) and the debt/equity ($\frac{D}{K}$) ratio or the firm's financial structure.[4]

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[4]The assumption that the market price per share of the stock is a function of dividends rather than total net profit is disputed by some economists (32). They theorize that it is irrelevant whether net profit is distributed as dividends or retained earnings (excluding tax reasons) as far as the stock price is concerned because given a perfect market the return to the stockholders from dividends and retained earnings will be the same. J. Lintner (28) found, though, that under conditions of uncertainty stockholders may have a preference for either dividends or retained earnings and this preference will be reflected in the price per share of the stock. In (32) the authors found that the value of corporations stock depends on its financing policy, as is assumed here.

$$V = V(\frac{\pi-\rho}{S}, \frac{D}{\overline{K}})^{5} \qquad [11]$$

The stock price is assumed to be positively related to dividends per share, which means that an increase in the dividend payment will reflect itself in the market by increasing the price per share $(\frac{\partial V}{\partial (\frac{\pi-\rho}{S})} > 0)$.

The second variable, the debt/equity ratio is also assumed to initially have a positive effect upon the stock price. The entrepreneurial firm will use debt or leverage in its financial structure in order to obtain a higher rate of return on equity for its stockholders.[6] An increase in debt financing, however, introduces a certain amount of risk of default into the firm that is not present when there is zero leverage. The buyers and sellers in the stock market presumably evaluate the higher rate of return that can be obtained from using the debt against the risk of default, and in turn partially make their decision to buy or sell the stock on that basis. In this specification, it is assumed that the debt/equity

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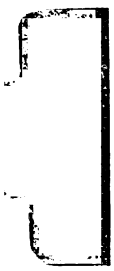
[5]The equity component in the $\frac{D}{\overline{K}}$ ratio will include retained earnings of the firm. This means $\overline{K}$ will be used in this variable rather than K (i.e., $\overline{K} = K + \rho$).

[6]This will occur as long as the return on assets for the firm exceeds its cost of debt.



ratio will have a positive effect upon the stock price at low and moderate levels of debt[7] relative to equity and a negative effect upon the price at high levels of debt to equity ($\frac{\partial V_t}{\partial \frac{(D)}{\bar{K}}} > 0$ up to the moderate debt level, then $\frac{\partial V_t}{\partial \frac{(D)}{\bar{K}}} < 0$). This implies that at low and moderate levels of debt the stock market evaluates the higher return from the use of debt greater than the risk of defalut incurred from the debt. Above this moderate level, however, the stock market would view the risk from the debt as being greater than the higher rate of return from the leverage, and thus it would have a negative affect upon the price of the stock.[8]

The dropping of Vickers' two assumptions on firm behavior and the stock market yields a maximand corresponding to the definition of stockholders' wealth discussed in Section B. Substituting Equations 2 and 11 into the wealth definition (Equation 1a) and imposing the two constraints (the money capital availability constraint (Equation 9a) and the net profit constraint (Equation 10a) on the maximand, yields the following Lagrangian function:

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[7] A moderate level of debt may vary from industry to industry. For a discussion of variations in financial structure see (46:293-294). Also, this analysis of leverage and risk is similar to the analysis setforth in (5).

[8] There are alternative theories on the effect of the debt/equity on stock prices. A summary of several of these theories can be found in (6:9-16).

$$F = [P(Q) \cdot Q(X,Y) - (W_1X + W_2Y + r(D) \cdot D) - \rho] +$$
$$\mu[K + D + \rho - g(Q) - \alpha X - \beta Y] + \lambda[\pi - \rho - \gamma] +$$
$$V(\frac{\pi-\rho}{S}, \frac{D}{K}) \cdot S \qquad [12]$$

The two constraints imposed on the net profit function are preceeded by μ and λ which are defined as the coefficients of the constraint variables ($\mu(K+D)$ and $\lambda(\pi)$). The values of μ and λ are determined by the general solution of the problem and have an important economic interpretation as the results will show.

The firm will how have four operating decisions to make simultaneously in maximizing the stockholders' wealth. These are the optimal quantities of X and Y to purchase, the optimum amount of debt to hold, and the optimal quantity of profit to retain in the firm. Taking the partial derivative of F with respect to the six variables yields the following conditions:

$$\frac{\partial F}{\partial X} = [(p + Q\frac{dp}{dQ})Q'_x - W_1] - \mu[g'(Q)Q'_x + \alpha]$$
$$+ \lambda[(p + Q\frac{dp}{dQ})Q'_x - W_1]$$
$$+ \frac{\partial V}{\partial(\frac{\pi-\rho}{S})}[(p + Q\frac{dp}{dQ})Q'_x - W_1] = 0 \qquad [13]$$

$$\frac{\partial F}{\partial Y} = [(p + Q\frac{dp}{dQ})Q'_y - W_2] - \mu[g'(Q)Q'_y + \beta]$$

$$+ \lambda[(p + Q\frac{dp}{dQ})Q'_y - W_2]$$

$$+ \frac{\partial V}{\partial(\frac{\pi-\rho}{S})}[(p + Q\frac{dp}{dQ})Q'_y - W_2] = 0 \qquad [14]$$

$$\frac{\partial F}{\partial D} = -(r + D\frac{\partial r}{\partial D}) + \mu - \lambda(r + D\frac{\partial r}{\partial D})$$

$$+ \frac{\partial V}{\partial(\frac{\underline{\underline{D}}}{\overline{K}})} \frac{\partial(\frac{\underline{\underline{D}}}{\overline{K}})}{\partial D}) = 0 \qquad [15]$$

$$\frac{\partial F}{\partial \rho} = -1 + \mu - \lambda + (\frac{\partial V}{\partial(\frac{\underline{\underline{D}}}{\overline{K}})} \frac{\partial(\frac{\underline{\underline{D}}}{\overline{K}})}{\partial \overline{K}} \frac{\partial \overline{K}}{\partial \rho}) = 0 \qquad [16]$$

$$\frac{\partial F}{\partial \mu} = K + D + \rho - g(Q) - \alpha X - \beta Y = 0 \qquad [17]$$

$$\frac{\partial F}{\partial \lambda} = \pi - \rho - \gamma = 0 \qquad [18]$$

By rearranging Equation 17, it can be seen that when the money capital constraint is operative the following maximizing condition holds:

$$K + D + \rho = g(Q) + \alpha X + \beta Y \qquad [17a]$$

This condition states that when the constraint is binding, the total money capital available equals its total requirements. When this condition holds, μ, the

Langrange multiplier can be given an economic interpretation of the following form:

$$\mu = \frac{dW}{dM} \qquad [19]$$

In this case μ measures the amount by which stockholders' wealth could be increased by an increase at the margin of a unit of money capital.[9] It can be defined, therefore, as the marginal wealth productivity of money capital (44:153).

Rearranging Equation 18 reveals that when the profit constraint is binding the following condition holds:

$$\pi = \rho + \gamma \qquad [18a]$$

This condition states that when the constraint is operative, the total net profit available is used as retained earnings and dividends. When this condition holds λ, the constraint variable, can be defined as

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[9]The direct relationship between money capital and the firm's wealth is not explicit in this definition of μ. A change (increase) in money capital will provide the firm additional funds with which it can allocate to working capital and the two inputs. This means the firm will have resources to purchase new capacity which will allow for the expansion of its output and sales which in turn will lead to increased wealth. In other words, an increase in money capital expands the constraint to allow the firm to increase its production and therefore provide stockholders a larger wealth.

$$\lambda = \frac{dW}{d\pi} \qquad [20]$$

This definition of λ can be interpreted as the marginal wealth productivity of net profit for the period. If the entire net profit was paid to the stockholders in the form of dividends (as was the case in the Vickers' model), λ would define the return to stockholders' wealth that these dividends would yield. λ can thus be interpreted as the rate of return to the stockholders of the net profit when it is distributed entirely as dividends. In this model, the profit that is retained in the firm for use as money capital must yield a return to stockholders' wealth (μ) which is greater than or equal to λ. (This result will be derived from the previous solutions.)

Rearranging Equations 13 and 14 and setting them equal to each other yields the following condition:

$$\frac{Q'_x}{Q'_y} = \frac{W_1 \left(1+\lambda+ \frac{\partial V}{\partial \left(\frac{\pi-\rho}{S}\right)}\right) + \mu\alpha}{W_2 \left(1+\lambda+ \frac{\partial V}{\partial \left(\frac{\pi-\rho}{S}\right)}\right) + \mu\beta} \qquad [20]$$

This condition again states that the ratio of the marginal physical products of inputs X and Y must equal the ratio of their effective marginal costs. In this case the effective marginal cost of each input has four parts. The first is the direct unit cost of the input (W_i) that

the firm must pay to acquire the factor's services. The second is the money capital cost of the factor input which is the marginal productivity of money capital (μ) times the capital intensity of the input in question (α or β). The third part of the input's effective marginal cost is the stockholders' loss in return from the firm's payment of the per unit cost of the input (λw_i). The firm, in order to acquire a unit of capacity of an input, must directly pay a per unit cost. Payment of this cost reduces the net profit of the firm which means that this period's potential wealth of the stockholders has been reduced. Since the stockholders not only lose the direct factor payment, but also the return on this payment, the rate of return on net profit as stockholders' wealth is multiplied by this per unit cost of the input (λw_i), and this amount becomes part of the effective marginal cost of each factor of production. The fourth part of the input's effective marginal cost is the effect that the use of the additional units of input has had upon the price of the stock $(\frac{\partial V}{\partial (\frac{\pi - \rho}{S})} W_i)$. Payment of the direct unit cost of the firm's inputs will reduce dividends per share which in turn will change the price of the stock. In order to account for the effect that the input has upon the share price, the direct unit of cost of the input is multiplied with

the stock price change, and this figure becomes part of the effective cost of the factor inputs.

Comparing this result with the normal capital saturation case (i.e., when $\frac{Q'_x}{Q'_y} = \frac{w_1}{w_2}$), it can be seen that when the money capital constraint is binding ($\mu \neq 0$) there will be a change in the optimum factor combinations. This change will depend upon the different capital intensities of the two inputs. Since it is assumed input Y is more capital intensive than input X, the money capital requirement coefficient of Y will be greater than the money capital requirement coefficient of X ($\beta > \alpha$). This means the ratio of the capital bound marginal costs will be less than the ratio of the capital saturated marginal costs.

$$\frac{w_1 \left(1+\lambda+ \frac{\frac{\partial V}{\partial(\pi-\rho)}}{S}\right) + \mu\alpha}{w_2 \left(1+\lambda+ \frac{\partial V}{\partial(\pi-\rho)}\right) + \mu\beta} < \frac{w_1}{w_2} \qquad [22]$$

Effectively what this implies is that the cost of the capital intensive input (Y) has been increased relative to input X which in turn will cause the firm to use less of Y than it would under the traditional case of capital saturation.[10]

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[10]The only possible change in interpretation this addition to input marginal cost could bring about

Rearranging Equation 15 yields the following condition:

$$\mu + \frac{\partial P}{\partial \frac{(D)}{K}} \frac{\partial \frac{(D)}{(K)}}{\partial D} = (r + D\frac{\partial r}{\partial D})\ (1 + \lambda) \qquad [15a]$$

This maximizing condition states that debt capital should be used up to the point where its marginal wealth productivity plus the marginal stock price increase from using the optimum quantity of debt capital equals the effective marginal cost of debt. This result implies that when the firm is maximizing stockholders' wealth, it must attempt to achieve the optimal level of debt

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if the $\lambda W_1 + (\frac{\partial V}{\partial \frac{(\pi-\rho)}{S}})W_1$ was significantly greater than $\lambda W_2 + (\frac{\partial V}{\partial \frac{(\pi-\rho)}{S}})W_2$ to counteract the difference in the capital intensities of the inputs (α and β). Since X is assumed to be less capital intensive than Y, the capital coefficient of X (α) is less than the capital coefficient of Y (β). This difference allowed for the interpretation given in the Vickers model. Now, if $\lambda W_1 + (\frac{\partial V}{\partial \frac{(\pi-\rho)}{S}})W_1$ were greater than $\lambda W_2 + (\frac{\partial V}{\partial \frac{(\pi-\rho)}{S}})W_2$ by an equal or greater amount than the difference in the money capital costs, this ratio could become equal to or greater than the ratio under capital saturation $\frac{W_1\ (1+\lambda+\frac{\partial V}{\partial \frac{(\pi-\rho)}{S}}) + \mu_\alpha}{W_2\ (1+\lambda+\frac{\partial V}{\partial \frac{(\pi-\rho)}{S}}) + \mu_\beta} \geq \frac{W_1}{W_2}$ and the interpretation given our results would become invalid. (The possibility of this event occurring is being assumed away in this discussion.

not only because of its contribution to profit and dividends, but also because of its effect on the stock price through the debt/equity ratio. If the firm was overextended in debt capital its debt/equity ratio would be nonoptimal and the effect on the stock price would be negative. In this case the marginal productivity of debt capital (μ) would be less than the effective marginal cost of debt plus the decrease in the stock price brought about by the nonoptimal debt/equity ratio.

$$\mu < (r + D\frac{\partial r}{\partial D})\ (\lambda + 1) + \frac{\partial P}{\partial (\frac{D}{K})} \frac{\partial (\frac{D}{K})}{\partial D} \qquad [23]$$

The effective marginal cost of debt, in this condition, also consists of two elements; the direct marginal interest cost of obtaining an additional amount of debt capital and the stockholders' foregone dividend cost from using debt capital in the firm's financial structure. This foregone dividend cost comes as a result of the profit constraint which the firm is subject to, and it estimates the return to stockholders' wealth that would be possible if the marginal interest cost had been paid to the stockholders in the form of dividends. Since the firm uses debt capital for financing purposes it must pay an interest cost. This interest cost payment reduces the potential dividend that the firm can

distribute, but the actual cost to the stockholders is not only the dollar reduction in the dividend, but also the return that the stockholder could earn on his interest payment (which is represented by $\lambda(r+D\frac{r}{D})$). So for the firm to be maximizing stockholders' wealth with respect to debt capital, it must use debt capital until its marginal wealth productivity (μ) plus its marginal stock price increase $(\frac{\partial P}{\partial (\frac{D}{K})} \frac{\partial (\frac{D}{K})}{\partial D})$ equals its two part marginal $[r+D\frac{\partial r}{\partial D} + \lambda (r+D\frac{\partial r}{\partial D})]$.

The retained earnings decision exhibited in Equation 16 can be rearranged as follows:

$$\mu + \frac{\partial P}{\partial (\frac{D}{K})} \frac{\partial (\frac{D}{K})}{\partial \overline{K}} \frac{\partial \overline{K}}{\partial \rho} = \lambda + 1 \qquad [16a]$$

This condition states that when the optimal amount of earnings is retained in the firm, the marginal wealth productivity of retained earnings plus the marginal effect on the stock price from the retained earnings equals the effective marginal cost of retained earnings. This result implies that when the firm is maximizing stockholders' wealth, the total marginal return of retained earnings will consist of the marginal contribution to profit and dividends plus the marginal

contribution arising from the change in the price of the stock.[11] Additionally, the marginal cost of retained earnings consists of λ, the marginal wealth productivity of profit distributed as dividends ($\lambda = \frac{dW}{d\pi} = \frac{dW}{d\Delta}$) plus one. This result implies that earnings should be retained in the firm until their productivity as money capital plus their return through the stock price equals the rate of return the stockholders could receive if the retained funds had been paid as dividends.[12]

Since the decision to retain profit for financial purposes cannot be made independently, consideration must be taken of the equity and debt decisions made by the firm. Equity (defined as only the value of the stock) is assumed to be constant at some level, which means the firm must hold an optimum combination of debt funds and retained earnings for the given quantity of equity. Equating the debt and retained earnings solutions (Equations 14 and 16), and rearranging terms, the following condition emerges:

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[11] If a firm retains an excessive amount of profit the change in the stock price will be negative and thus will become a part of the marginal cost of retained earnings. This result is similar to that suggested by Kuh (25:35).

[12] In (9), the authors derive a similar result. That is, the cost of retained earnings (k) is an increasing function of the dividend retention rate (br). They define k as rate of return that investors require on the share of stocks, λ, in this case, is equivalent to k.

$$\mu + \frac{\partial P}{\partial \left(\frac{\bar{D}}{K}\right)} \frac{\partial \left(\frac{\bar{D}}{K}\right)}{\partial D} - \frac{\partial C}{\partial D} = \mu + \frac{\partial V}{\partial \left(\frac{\bar{D}}{K}\right)} \frac{\partial \left(\frac{\bar{D}}{K}\right)}{\partial \bar{K}} \frac{\partial \bar{K}}{\partial \rho} - \frac{\partial C}{\partial \rho},$$

$$\text{where} \quad \frac{\partial C}{\partial D} = (\lambda+1)\left(r+D\frac{\partial r}{\partial D}\right)$$

$$\text{and} \quad \frac{\partial C}{\partial \rho} = \lambda + 1 \qquad [24]$$

$$\frac{\frac{\partial C}{\partial \rho}}{\frac{\partial C}{\partial D}} = \frac{\mu_D + \frac{\partial V}{\partial \left(\frac{\bar{D}}{K}\right)} \frac{\partial \left(\frac{\bar{D}}{K}\right)}{\partial D}}{\mu_\rho + \frac{\partial V}{\partial \left(\frac{\bar{D}}{K}\right)} \frac{\partial \left(\frac{\bar{D}}{K}\right)}{\partial \bar{K}} \frac{\partial \bar{K}}{\partial \rho}} = 1 \qquad [24a]$$

$$\frac{\partial C}{\partial \rho} = \frac{\partial C}{\partial D} \qquad [24b]$$

Equation 24b states that the firm has achieved the optimal combination of debt and retained earnings when the marginal cost of debt becomes equal to the marginal cost of retained earnings. Since the marginal productivities of a dollar's worth of retained earnings (μ_ρ) and debt capital (μ_D) are equal and the marginal stock price increases from an optimal debt/equity ratio the same for both retained earnings and debt capital, the ratio of the two marginal costs will equal one. This means that for a given level of equity the optimal quantities of debt and retained earnings will be determined by their respective marginal costs.

The firm will need to make a decision on not only the quantity of money capital that will be needed to maximize stockholders' wealth in the time period, but also on the combination of the three components of money capital that will be optimal. With equity capital (value of the stock) assumed to be fixed, the firm will acquire the maximizing quantity of money capital by increasing its use of debt and/or retained earnings (depending upon their relative marginal costs). It will continue to add debt and retained earnings to the fixed level of equity until the marginal costs of debt and retained earnings are equal. At this point the firm will have the optimal quantity of money capital as well as the optimal combination of money capital. This implies then, that when the firm reaches this position, it will have achieved the optimal debt/equity ratio or the financial structure which will maximize stockholders' wealth for the time period.

CHAPTER III

THEORY OF THE MANAGERIAL FIRM

Introduction

A managerial firm is generally defined as a firm which is operated to maximize the utility of the managers rather than the utility of the owners. In order for a firm to function as a mangerial firm, two conditions must be satisfied: the firm must be operating in an inperfectly competitive environment and there must be a separation of the ownership function in the firm from the management function. Under these conditions, managers will have latitude to make discretionary decisions in the operation of the firm leading to the maximization of their own utility. If the managers' utility function is different from that of the owners, these discretionary operating decisions should cause the observed behavior of a managerial firm to differ from that of an entrepreneurial firm.

In Chapter II, it was assumed that the owners of a firm will maximize their utility by maximizing stockholders' wealth in any time period. Stockholders' wealth was defined as the dividends received in the period plus

the market value of the shares of stock in the period. It can be generally assumed, however, that the managers' utility will not be a function of stockholders' wealth (unless the managers and owners are the same), but will be related to such things as managerial income, status, and power (16:271-316). Therefore, given opportunities for managerial discretion and differences between managers' and owners' utility functions, it can be expected that managerial firms will manifest different behavior than entrepreneurial firms.

In the theory of the managerial firm, the question becomes: What kinds of behavior will be exhibited by the firm as managers make operating decisions while pursuing the objective of maximum managerial utility? In Chapter I the relationship between managerial utility and four objectives was discussed (2,31,48). It was hypothesized that managers could maximize their income and prestige (two variables in the managerial utility function) by maximizing sales (2), the growth rate of the firm (31), and certain expense components called staff and emoluments (48). It was assumed that managerial salaries and prestige are very closely related to total sales of the firm as well as to the total growth rate of the firm or to firm size (i.e., the faster a firm grows or the larger the firm's absolute size the more prestige the manager receives and the higher his income). Certain expense

components such as staff and managerial emoluments (the portion of management salaries that are discretionary) were also assumed to be related to managerial prestige and income. This means we may observe managerial firms maximizing economic profit (i.e., MR = MC) and spending it on large organizational staffs and managerial emoluments (expense accounts) rather than dividing the profit optimally between firm operating requirements and owners (48). We may also observe managerial firms building staffs of nonoptimal size and expending large sums of money or nonproductive expense items creating inefficiency within the firm and therefore having an impact on the firm's production (X-inefficiency, 27).

Monsen and Downs Theory of Managerial Firms

An additional theory of managerial firms put forth by Monsen and Downs (34) maintains that managerial firm behavior will differ from entrepreneurial firm behavior because of goal divergence and large firm size. The authors maintain that since managers are not constrained to maximize the owners' utility,[1] they will operate the

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[1]They assume the owners' utility is a function of dividend income and the market value of the shares of stock. This is consistent with the definition of stockholders' wealth used as a basis for the theory of the entrepreneurial firm discussed in Chapter II.

firm to maximize their own utility (which is assumed to be a function of their lifetime income), which implies that managerial firm behavior will differ in certain respects from entrepreneurial firm behavior.

Like Baumol, Marris, and Williamson, the authors include in their theory of the managerial firm a minimum stockholder constraint. They state that management will direct the firm toward achieving a constant or slightly rising dividend payout plus a steadily increasing stock price in order to satisfy the stockholders.[2] Once the managers have achieved stockholder satisfaction, they are free to pursue the objective of maximizing their lifetime income by making decisions within the firm which will maximize salaries and bonuses as well as leisure, prestige, and power (34:227).

Monsen and Downs discuss the implications of the behavior of a firm that is operated to maximize the owners' lifetime income rather than profit.[3] They maintain that decisions made by managers who are attempting to maximize their utility, subject to a minimum stockholder constraint, will cause the firm to avoid risky decisions, to have less

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[2]The increase in the stock price only needs to be at a "satisfactory" rate, not a maximum rate.

[3]The authors implicitly make the assumption (knowingly or unknowingly) that if the firm maximizes profit, it will maximize the owners' utility. That is, maximizing profit will maximize dividend income and the market value of the stock.

variability of earnings, to grow more slowly, and to be less likely to go bankrupt than they would if the managers sought to maximize profit. They additionally feel that the behavior of managers may lead managerial firms to diversify (through merger) more than entrepreneurial firms to avoid the risk of only one product line, to avoid crask programs for research and development (and thus slower growth), to have more extravagant expense accounts for managers, to contribute to charitable causes more than they should from a purely profit-maximizing point of view since it increases manager prestige, and to respond more slowly by cutting managerial expenses when profit declines than they would if they really pursued profit maximization.

Monsen and Downs also point out that firm size has important influence upon a firm's behavior. They maintain that the behavior of a firm which is not optimal from the viewpoint of its owners can be reflected in size alone (X-inefficiency) as well as by a combination of size and divergent goals of the managers and owners. The authors state that nearly all "very large firms must develop bureaucratic management structures to cope with their administrative problems. But such structures inevitably introduce certain conflicts of interest between men in different positions because the goals of middle and lower management are different from those of top management"as well as being different from the goals of the

owners. Therefore, Monsen and Downs contend that even if the owners of a firm wish to maximize profit, the difference between owner motivation and managerial motivation will cause systematic deviations from profit maximizing behavior as long as the firm is large enough so that the owners themselves cannot supervise all facets of its activities. This means that all very large firms experience some diseconomies of scale because of size and this causes the firm to become inefficient[4] and thus deviate from owner utility maximization. Thus, Monsen and Downs imply that all very large firms must be managerial firms since they are experiencing diseconomies of scale and therefore have not been constrained to maximizing the owners' interests. However, some large firms may have achieved their size because of large economies of scale within a particular industry. Therefore, while large size may be some indication of a managerial firm, it is neither a necessary nor a sufficient condition for being a managerial firm. Monsen and Downs may mean, however, that all large firms, whether manager controlled or not, have a tendency to be more managerial in nature than small firms. That is, they would expect that large firms which are owner controlled would more likely exhibit X-inefficiency than small firms which are owner

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[4]This would be identical to Liebienstein's (27) concept of X-inefficiency.

controlled. The extent of the X-inefficiency, however, may depend upon how tightly controlled the large firm is. If a very large firm was closely held, it would probably exhibit less X-inefficiency than a very large firm which was not closely held. Therefore, it appears that while the size of the firm may influence its behavior, the extent of the size influence may depend upon whether or not the firm is closely held and tightly controlled.

While all the relationships between size, managerial utility and firm behavior are not entirely clear,[5] the authors do loosely and generally describe the theory of a managerial firm. In the next section of this chapter, an attempt will be made to draw upon the various theories of managerial firms and explicitly discuss the differences between a managerial firm and the entrepreneurial firm specified in Chapter II. In most cases managerial firm behavior is compared to the behavior of a profit-maximizing firm which generally is an unfair comparison

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[5]Monsen and Downs begin by specifying owners' utility as function of dividend income and market value of the stock. They then proceed to describe the difference between managerial firm behavior and the behavior of a profit-maximizing firm. A problem arises because maximizing profit may not maximize owners' utility in the type of firm the authors are describing. Most corporations, whether owner operated or manager operated, do not maximize profit in the traditional sense, but do maximize some form of stockholders' wealth. Monsen and Downs recognized this fact, but proceeded to ignore it when they describe the difference between a managerial firm and a profit-maximizing firm.

since many entrepreneurial firms do not maximize profit in a theoretical sense.

Managerial Firm Behavior Versus Entrepreneurial Firm Behavior

In Chapter V, an entrepreneurial firm was specified which was assumed to be maximizing owners' utility. Owners' utility was assumed to be a function of stockholders' wealth which was defined as dividends received in a time period plus the market value of the shares of stock in the period. Four wealth maximizing conditions were obtained from the theory of the entrepreneurial firms: the optimal quantities of factor inputs (X and Y) that the firm should purchase, the optimal quantity of external debt the firm should hold, and the optimal amount of earnings that the firm should retain in order to maximize stockholders' wealth.

Input Decision

The entrepreneurial firm's decisions with respect to factor X and factor Y (the capital intensive factor) state that the firm should use the two factors until their managerial revenue products equal their marginal factor costs. In comparing the two input decisions of the entrepreneurial firm to some current theories of managerial firms, one would expect to find that (relative to entrepreneurial firms) managerial firms will generally

have a tendency to overuse the variable input (X). It is generally argued that the variable input such as staff, e.g., Williamson (48), provides the managers with a source of prestige and status. This implies that managers derive a return from a large organizational staff that goes beyond its contribution to productivity. This further implies that this additional implicit return to managers will cause the marginal utility productivity MUP of the variable input of managerial firms to be greater than the MUP_x for entrepreneurial firms.

$$MUP_x^M > MUP_x^E \qquad [1]$$

Assuming there is no difference in the marginal factor cost (MFC) of the input for both types of firms, the MUP_x^M will thus result in a greater use of input X for managerial firms, as depicted in Figure 1.

Debt

The theory of the entrepreneurial firm, as specified in Chapter II, maintains that the firm will hold a level of debt that maximizes stockholders' wealth or until the marginal revenue product of debt equals its marginal cost. Since managerial firms are assumed to be operated in the interests of the managers rather than the owners, it could be expected that the quantity of debt held in the managerial firm's financial structure would not

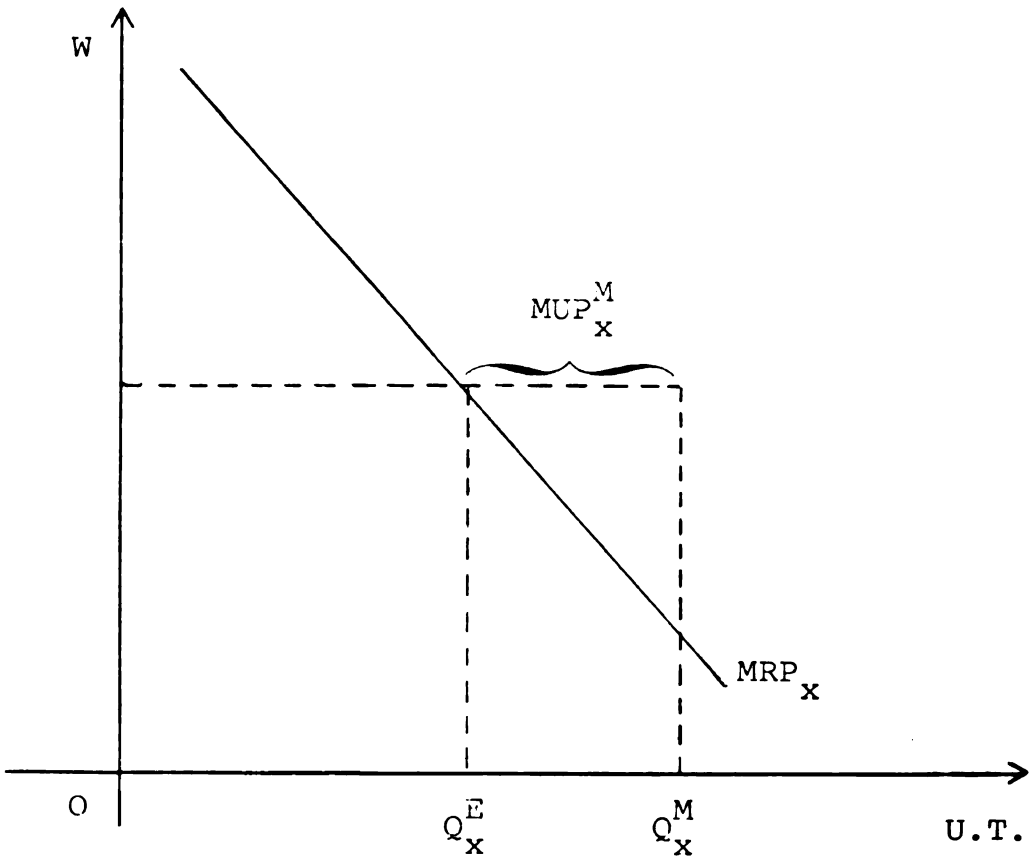

Figure 1

be the same as that held by entrepreneurial firms. However, it is not entirely clear whether managerial firms will have an incentive to hold more or less debt than entrepreneurial firms, and the debt decision may, in fact, depend upon the owners' and managers' individual preferences toward risk.

There are two basic reasons why managerial firms may hold less debt than entrepreneurial firms, and there is one major reason why managerial firms may have a preference for debt. First, managerial firms have an incentive to use stock issues rather than debt issues in

order to lessen the probability of one group or individual gaining control of the firm. Secondly, managerial firms may maintain a lower level of debt because the risk involved in holding debt in the firm's financial structure is not outweighed by the benefits derived from promoting firm growth through a high use of leverage. Since the benefits of leverage accrue mostly to the owners, managers have little incentive to assume the risk of a highly leveraged firm.[7] In fact, managers may view the risk of firm failure as being greater for them than for the owners, since the managers lose their job and position while the owners only lose their investment.

At the same time, the managers' desire to achieve a large firm size may have a tendency to counteract some of the risk involved from using a large quantity of debt financing in the firm. Marris (31) theorizes that managers may have an incentive to increase the size of the firm because managerial salaries and prestige are a function of firm size. Baumol also (2) makes the point that managerial firms maximize sales rather than profit because a manager's salary and status is a function of sales and not profit. Therefore, a firm operated in the

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[7] In the managerial firm described by Williamson (48), this reasoning would not hold since he actually specified a profit-maximizing firm and only considered the managers' effect on the division of profit.

the interests of managers that maximizes size or sales would need to obtain sufficient financing in order to supply the necessary capital to promote firm growth. Since it would probably be difficult for a firm to achieve a high rate of growth from only internal financing, there would be a need to finance externally, either by entering the debt market or issuing additional shares of stock. Further, since debt financing has been generally considered to be less costly for firms than stock financing (because of high floatation costs), a firm interested in maximizing its size would probably obtain the necessary financing by issuing a relatively large quantity of debt and this strategy should be reflected in the makeup of the firm's financial structure.

These counteracting incentives for holding debt by managerial firms makes it uncertain whether they would hold more or less debt than entrepreneurial firms. The incentive for managerial firms to use debt financing to promote firm growth means that the effective marginal utility product of debt (MUP) for managerial firms would be greater than the MUP_D for entrepreneurial firms. However, the managers' desire to remain in control of the firms and to avoid the risk of firm failure would make the MUP_D^M less than the MUP_D^E. These counteracting forces, therefore, do not permit us to make a clearcut

determination whether managerial firms will hold an optimal level of debt (i.e., where $MUP_D = MFC_D$) that is greater than or less than the level held by entrepreneurial firms. Thus, the relative levels of debt held by managerial and entrepreneurial becomes an empirical question, and will be handled as such in the statistical section of the study.

Retained Earnings

The fourth firm decision variable to be examined is retained earnings. The theory of the entrepreneurial firm revealed that in order to maximize stockholders' wealth, earnings should be retained by the firm until the marginal revenue of retained earnings equals the marginal cost. Since managerial firms are not operated in the interests of the owners, it could be expected that the level of earnings they retain will not be the same as the level retained by entrepreneurial firms. The question is, how will the managerial firms' retained earnings decision differ from entrepreneurial firm behavior?

Earnings are generally retained from net profit by a firm to finance the purchase of assets necessary for the future growth of the firm. The amount of earnings retained in any time period will be a management decision based upon existing explicit and implicit revenue and cost considerations. It was pointed out earlier that

entrepreneurial firms will retain earnings at a level which maximizes stockholders' wealth or until the marginal revenue of retained earnings equals the marginal cost. Managerial firms, however, may base the retained earnings decisions upon a different set of revenue and cost criteria which, most probably, will lead to a level of retained earnings that does not maximize stockholders' wealth.

Retained earnings, generally, can be viewed as a source of funds that could be used in a discretionary manner for managerial emoluments (48:134-139). That is, managers of firms can withhold and allocate these funds as they see fit, subject to a varying number of constraints. Since managers are interested in maximizing their utility, the discretionary nature of retained earnings provides them with a source of funds which they can use to maximize their income and prestige (i.e., managers can purchase company airplanes, take company financed trips, and pay themselves large bonuses). This implies, then, that operators of managerial firms impute a greater benefit to retained earnings than do the managers of entrepreneurial firms. It could be expected then, that the marginal utility product of retained earnings (MUP) for managerial firms will be greater than the MUP of retained earnings for entrepreneurial firms.

$$MUP_{\rho}^{M} > MUP_{\rho}^{E} \qquad [2]$$

The MC of retained earnings may be expected to be smaller for managerial firms than it is for entrepreneurial firms. The MC_{ρ} for entrepreneurial firms is the rate of return that stockholders would receive if the entire net profit were paid to them in dividends. Since managerial firms have the opportunity to discount stockholders' interest (because of the separation of ownership and control), it could be expected that managers will withhold a larger portion of retained earnings and thus pay lower dividends because the managers do not need to bear the explicit cost of withholding retained earnings (i.e., receiving a lower rate of return on an investment) as do the firm owners. Therefore, the effective marginal cost of retained earnings for managerial firms is assumed to be less than the MC for entrepreneurial firms.[8]

$$MC_{\rho}^{E} > MC_{\rho}^{M} \qquad [3]$$

Assuming that the MUP_{ρ}^{M} is greater than MUP_{ρ}^{E} and MC_{ρ}^{M} is less than the MC_{ρ}^{E}, the optimum amount of

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[8]This analysis is consistent with managerial firm theory since it specifies that stockholders' interests cannot be completely ignored, but they can be discounted below a level which would be required if the stockholders were in control (Monsen and Downs (34:226, and Williamson (48:26).

retained earnings will be greater for managerial than for entrepreneurial firms[9] as depicted in Figure 2.

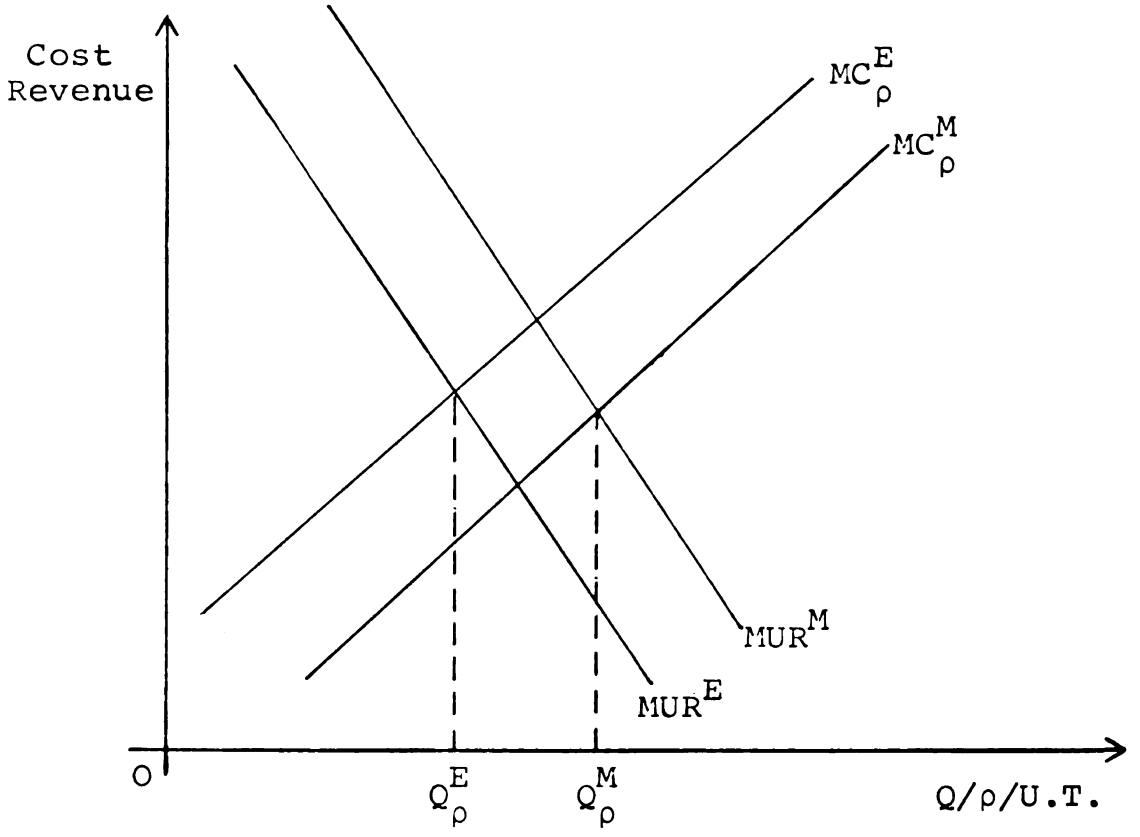

Figure 2

[9]One problem which has been ignored in my analysis is the effect that varying personal tax rates may have upon entrepreneurial firm behavior. Friedman (13) maintains that entrepreneurial firms may have an incentive to retain a large portion of earnings because of the different tax rates on capital gains and personal income (dividends). While this may be true for very closely held firms (one or two owners), generally an entrepreneurial firm will not be able to make a dividend-retained earnings decision that is optimal for all its stockholders. Many firms, therefore, adopt a consistent dividend policy and let investors make their choice in the market place. For this reason, I have assumed that the different personal tax rates will not affect the behavior of entrepreneurial firms.

CHAPTER IV

TESTING THE ENTREPRENEURIAL VS. MANAGERIAL HYPOTHESIS

Introduction

The theoretical analysis of entrepreneurial and managerial firms presented in Chapters II and III allows for the specification of several testable hypotheses that will attempt to differentiate between managerial and entrepreneurial firm behavior. In this chapter, the sample of managerial and entrepreneurial firms to be used in the study will be presented, along with a discussion of the hypotheses to be tested and the statistical methodology to be employed.

Selection of Sample

The sample of firms used in the empirical analysis was taken from the SIC two-digit industrial classification (20) containing food, flour, sugar, confectionary, and beverage firms. The selection of a sample of firms from a single industry classification differs somewhat from the approach taken in other studies attempting to test the managerial versus entrepreneurial hypothesis (22,25,32). In these other studies, firms were always selected for the

empirical analysis from a wide variety of industries. While attempts were made to control for a possible industry effect in their statistical analyses, it is not entirely clear whether they were successful in doing so. In fact, some of the results of Monsen, Chiu, and Cooley (33) indicate that the industry effect was significant which may imply that their sample did not allow them to adequately separate the control effect from the industry effect.

In selecting the sample of firms for this study, the most important criteria was to hold market conditions constant across the sample of firms. This required the use of as narrow an industry classification as was possible. The small number of firms in a three- or four-digit SIC classification, was a major constraint, however. Because of this constraint a two-digit industry classification (20) was used, and a sufficiently large number of both entrepreneurial and managerial firms could be selected. The sampling technique thus maintains some of the homogeneity among firms used in the statistical analysis, which should insure a more sensitive test of the managerial versus entrepreneurial hypothesis. The firms selected from this two-digit classification all appear on the Standard and Poor's Compustat data tape. A total

of 74 firms were used in the statistical analysis; 37 managerial firms and 37 entrepreneurial firms.[1]

Identification of Entrepreneurial and Managerial Firms

The classification of firms into managerial and entrepreneurial firm groups was completed in other studies by making a determination of who actually controlled the firm. The control of a firm was defined as the power to select or change management and was determined by the distribution of the firm's voting shares of stock (7:69-70). The criteria used to separate the firms into managerial and entrepreneurial groups was, therefore, based upon the type of stock ownership distributions that reflected owner or manager control.

Obviously, it can be assumed that if an individual owns a simple majority of the voting stock he is in complete control of the firms. However, as the stock of a firm becomes widely held, a much smaller proportion of the total shares will allow a person to acquire effective control. Berle and Means state that "roughly twenty percent" of the voting stock was enough to maintain minority owner control of a firm, and in some cases a smaller portion would give an individual effective control (7:93). The Temporary National Economics Committee found that 10

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[1] A list of all the firms appears in Appendix A.

to 20 percent of the voting shares may be adequate in some cases for effective firm control (45:27).

In a study done by Monsen, Chiu, and Cooley, firms were classified as manager or owner controlled so as to screen out as many intermediate types of firm control as possible (33:437-439). They considered a firm to be manager controlled if there was no block of ownership greater than 5 percent and if there was no recent history of owner control. They classified a firm as owner controlled if a party (individual, family, or family holding company) held 10 percent or more of the voting stock and was represented on the Board of Directors or in management. A party that controlled 20 percent or more of the stock was considered to be in control of the firm even if it did not take an active role in the firm.

Firms in the present study were classified using basically the same criteria as that used by other authors (7,26,33,45). An attempt was made to eliminate firms that could not clearly be put into the managerial or entrepreneurial classification. This technique allowed the hypothesis testing to be more meaningful, since it provided two polar groups of managerial and entrepreneurial firms. Firms were classified according to the following criteria:

Owner Control: One party (individual, family, or family holding company) owning 15 percent of the voting stock and represented on the Board of Directors or in management, and one party owning 25 percent or more of the voting without being active in the firm.

Manager Control: No evidence of owner control over the time period, and no single block of voting stock greater than 5 percent.

The time period for the data in this study runs from 1960 through 1970. Classification of the firms into managerial and entrepreneurial firm groups was done by determining control in 1960 and in 1970. In order for firms to be put into one group or another, it had to be either manager or owner controlled in both 1960 and 1970.

The data used in the empirical analysis was obtained from the Standard and Poor's Compustat data type. Individual data observations for each firm variable from 1960 through 1970 were collapsed and averaged into a single observation. Each variable for each firm therefore represented an eleven-year average and the statistical approach was basically a cross-sectional analysis as time was eliminated from the data. It was felt that this approach could be taken since the firms are from a fairly homogeneous group and the data did not indicate any unusual growth rates for firms during the period.[2]

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[2]Time was found to be generally insignificant in Monsen's (33) analysis.

Hypotheses to be Tested

The hypotheses developed for testing the entrepreneurial versus managerial hypotheses rests mainly upon the definitions of managerial firms that were specified by other authors (2,31,34,48). These hypotheses were developed by comparing the theory of the entrepreneurial firm in Chapter II to the various theories of the managerial firms.

Stockholder's Wealth vs. Rate of Return

The first hypothesis that will be tested deals with the definition of stockholder's wealth as it was used in the theory of the entrepreneurial firm in Chapter II. It was assumed in the theoretical specification, that an entrepreneurial firm will maximize stockholder's wealth over some time period. Stockholder's wealth (W_t) was defined as the dividends received by the stockholders during the time period (Δ_t) plus the market value of the shares of stock outstanding (V_t) in the period times the number of shares outstanding (S_t).

$$W_t = \Delta_t + V_t \cdot S_t \qquad [1]$$

Since the entrepreneurial firms are assumed to be maximizing stockholder's wealth, and presumably managerial firms will not be, we would expect to find entrepreneurial firms with a significantly larger wealth

variable than managerial firms, all other things equal. The null hypothesis then will be:

$$H_1: \quad \left(\frac{W_t}{A}\right)_E = \left(\frac{W_t}{A}\right)_M$$

where W_t^E and W_t^m are entrepreneurial and managerial firms stockholders' wealth, and A_E and A_M are the asset sizes of the entrepreneurial and managerial firms, respectively. The assets of the two types of firms normalize the wealth variables to account for differences in firm size.[3] The alternative hypothesis states that stockholders' wealth for entrepreneurial firms is greater than stockholders' wealth for managerial firms.

Similar tests have been applied to managerial and entrepreneurial firms using alternative definitions of an entrepreneurial firm's maximands. Generally, entrepreneurial firms have been assumed to be maximizing owners' interests when they maximize some definition of the rate of return on net worth or invested capital (23, 33,37). In order to verify the definition of stockholders' wealth used in Chapter II, a test will be set up which will compare this definition of stockholders' wealth with the entrepreneurial firm maximand used by Monsen, Chiu and Ccoley (33).

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[3]Firm sales could also be used to normalize for size, but since sales and assets are highly correlated (.81) assets were chosen as the scale variable.

Using the same sample of managerial and entrepreneurial firms, a null hypothesis will be tested which states that the net income/net worth ratio of entrepreneurial firms is equal to the net income/net worth variable of managerial firms (as used by Monsen, Chiu, and Cooley).

$$H_2: \quad \frac{NI_E}{NW_E} = \frac{NI_M}{NW_M}$$

The alternative hypothesis will be that the net income/net worth ratio of entrepreneurial firms is greater than the net income/net worth ratio of managerial firms.

Assuming both H_1 and H_2 are rejected, a comparison of the two maximands can be made by examining the size of the difference found between the entrepreneurial and managerial firms in both tests.[4] An additional null hypothesis can thus be tested which states that the difference found between entrepreneurial and managerial firms in the stockholders' wealth variable $[\Delta\frac{(W_t^E)}{A_E}_1]$ in H_1 will be equal to the difference found between the two types of firms using the maximand of $H_2[\Delta(\frac{NI_E}{NW_E})_2]$.

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[4] $\frac{W_t^E}{A_E} - \frac{W_t^m}{A_m} = \frac{\Delta(W_t)}{A}_1$ and $\frac{NI_E}{NW_E} - \frac{NI_m}{MW_m} = \Delta(\frac{NI}{NW})_2$

$$H_3: \quad \Delta\left(\frac{W_t^E}{A_E}\right)_1 = \Delta\left(\frac{NI_E}{NW_E}\right)_2$$

The alternative hypothesis will state that the difference found between entrepreneurial and managerial firms in H_1 is greater than the difference found between the firms in H_2. A rejection of H_3 will help to substantiate the theory of the entrepreneurial firm as it was developed in Chapter II of this thesis.

Firm Decision Variables

The fourth hypothesis to be tested is derived from the theoretical differences in the managerial and entrepreneurial firms decision on the quantity of the variable input that the firms use in their production process. The theory of the managerial and entrepreneurial firms predicted that, relative to entrepreneurial firms, managerial firms will have a tendency to overuse the variable input (labor). This means that managerial firms should have an average product of labor which is less than the average product of labor for entrepreneurial firms, all other things equal. The fourth null hypothesis to be tested is:

$$H_4: \quad (AP_L)_M = (AP_L)_E$$

The alternative hypothesis will state that the $(AP_L)_M$ is less than the $(AP_L)_E$.

The fifth hypothesis to be tested in this study will deal with the quantity of debt held by managerial and entrepreneurial firms. While it can be expected that the quantity of debt held by the two types of firms is different, theory did not allow us to predict whether managerial firms will hold a larger or smaller quantity of debt in their financial structure than will entrepreneurial firms. The quantity of debt held thus became an empirical question and the fifth null hypothesis will state that the level of debt, normalized by assets, is equal for managerial and entrepreneurial firms.

$$H_5: \quad \left(\frac{D}{A}\right)_M = \left(\frac{D}{A}\right)_E$$

The alternative hypothesis will be $(\frac{D}{A})M$ is not equal to $(\frac{D}{A})_E$.

The sixth hypothesis to be tested will deal with the quantity of earnings retained by managerial and entrepreneurial firms. The theory developed in Chapter III indicates that managerial firms may have an incentive to withhold a higher percentage of profit in the form of retained earnings in any time period than entrepreneurial firms. The null hypothesis to be tested, thus, will state that the proportion of earnings retained by

managerial firms will equal the proportion retained by entrepreneurial firms.

$$H_6: \quad \left(\frac{\rho}{\pi}\right)_M = \left(\frac{\rho}{\pi}\right)_E$$

Alternatively, it will be hypothesized that the proportion of earnings retained by managerial firms will be greater than the proportion retained by entrepreneurial firms.

A fifth decision variable that can be examined is the debt/equity $\left(\frac{D}{K}\right)$ ratio maintained by both types of firms. It was hypothesized earlier that entrepreneurial firms will hold a lower proportion of retained earnings than managerial firms, and the relative quantities of debt held by both types of firms would not be equal. These two variables make up two out of the three components of the debt/equity ratio as it was defined in the theory of the entrepreneurial firm in Chapter II. Since the rejection of these two null hypotheses will not allow us to determine whether the debt/equity ratio of entrepreneurial firms is greater than or less than the debt/equity ratio of managerial firms,[5] a test of H_7 may provide additional insight into entrepreneurial and managerial firm behavior especially with regard to the extent of the

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[5]The assumption is made that the stock portion of equity is unaffected by the type of control maintained in the firm.

leverage ratio maintained by both types of firms. Null hypothesis seven will state that the entrepreneurial firm's ratio $(\frac{D}{K})_E$ is equal to the managerial firm's ratio $(\frac{D}{K})_M$.

$$H_7: \quad (\frac{D}{K})_E = (\frac{D}{K})_M$$

The alternative hypothesis will state that the debt/equity ratio of entrepreneurial firms is not equal to the debt/equity by ratio of managerial firms.

Statistical Methodology

The basic statistical technique used to test the hypotheses in this study was an analysis of covariance which was carried out with a multiple regression program with dummy variables. All hypotheses were initially tested using a ratio from each of the hypotheses as the dependent variable (H_i) along with five basic independent variables (C = control type, Z = asset size of firms, CZ = size-control interaction, R = concentration ratio of firm's industrial group, and D = subindustry groups).

$$H_{ij} = f(C_{ij}, Z_{ij}, CZ_{ij}, R_{ij}, D_{ij}) \qquad [2]$$

where i = number of hypothesis and j = firm number.

The first independent variable indicates whether the firm is entrepreneurial or managerial controlled, the second indicates the asset size of the firm, the third

accounts for the interrelationship between size and control, the fourth proxies the competitiveness of the market in which each firm operates, and the fifth indicates the subindustry group for each firm in the study.

One equation was computed for each testable hypothesis using all five of the independent variables. Additional tests were made in order to determine the significance of the subindustry variables as they related to the control variable. The results and implications of the statistical tests are discussed in Chapter V.

CHAPTER V

RESULTS AND IMPLICATIONS

Introduction

Seven hypotheses relating to managerial and entrepreneurial firm behavior were tested in this thesis. The analysis of covariance technique[1] used in the study involved the estimation of one equation for each hypothesis in order to determine the significance of firm control, firm size, size-control interaction, concentration ratio, and subindustry groups. The basic equation, in the analysis contained five independent variables (C = firm control, Z = firm size, CZ = size-control interaction, R = concentration ratio, and D = subindustry).

$$Y_i = \alpha_i + \gamma_i C + \beta_i Z + \nu_i (CZ) + \eta_i R + \sum_{j=1}^{12} \delta_{ij} D_j + U_i \qquad [1]$$

where i = hypothesis number, j = subindustry group number, and U = error term.

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[1]Since an analysis of covariance program was unavailable, the sums of squares due to subindustry groups were determined by estimating one additional equation with this group of variables deleted. Results of the analysis appear as the F-test in all three tables.

The first independent variable (C) indicates whether the firm is entrepreneurial or managerial controlled. Control of each firm was indicated by using a qualitative or dummy variable with 1 signifying entrepreneurial firm control and 0 for a firm under managerial control. The sample of 74 firms divided into equal groups of 37 entrepreneurial and managerial firms each. A positive and significant relationship between the dependent variable and the control variable indicates that the size of the ratio in the dependent variable is directly related to the entrepreneurial firm group. If there is a negative relationship between the dependent and control variables, the size of the ratio is positively related to the managerial firm group.

The second independent variable, firm size (Z), was approximated by using total assets of each firm in all seven equations. Since size of firm may have an independent effect upon a firm's behavior (Monsen, 23) the use of this variable in each equation may allow us to better isolate the control effect. A significant and positive relationship between the dependent variable and the size variable would indicate that the size of the firm is directly related to the size of the ratio in the dependent variable.

The third independent variable is the size-control interaction variable. This variable was formed

by multiplying together the control dummy for each firm and its asset size. The use of the size-control variable will attempt to hold constant any effect that may come as a result of the interaction between firm size and type of control. Monsen (33) maintains that large firms tend naturally to be more managerial in nature than small firms, but as it was pointed out in Chapter III, the relationship between size and control is not entirely clear. While there may be more of a tendency for large firms to behave as a managerial firm, because of control loss, their behavior will generally depend upon the strength of the stockholder-control relationship. Since firm size and type of control may be interrelated, the use of this variable may allow us to better isolate the control effect. A significant and positive relationship between the dependent variable and the interaction variable would indicate that an increase in the dependent variable resulting from an increase in firm size would be greater for an entrepreneurial firm than for a managerial firm.[2] If the sign on the interaction variable is negative this would imply that an increase in the dependent variable from an increase in firm size would be greater for managerial firms.

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[2]The dependent variable would increase by $\beta + \nu C$ if the sign on the interaction variable was positive and it would increase by β if the sign was negative.

The fourth independent variable used in this analysis was the eight firm concentration ratio. This ratio represents the percentage of sales that are controlled by the eight largest firms in a specific industry. There were eight different concentration ratios computed for eight three-digit industrial classifications. Each firm was assigned the ratio which corresponded to the classifications in which it operated. The concentration ratio was used in the equation in order to control for differences in the competitive environment among the various subindustries in the sample. It could be expected that the behavior of managerial and entrepreneurial firms may be affected by the presence (or absence) of competitive pressures within a particular subindustry group and in order to isolate the effect of the control variable an account was taken of this competitive environment. A significant and positive relationship between the dependent variable and the concentration ratio would indicate that a high concentration ratio is associated with a large value of the dependent variable. It is assumed that a relatively high concentration ratio is a proxy for a less imperfectly competitive environment.

The fifth independent variable indicates the subindustry group (D) for each firm in the study. This variable was included in order to hold constant any effect that operating in a particular subindustry

(four-digit SIC classification) may have upon a firm's behavior. For example, a firm producing in the brewer subindustry group may have different capital requirements than a firm producing sugar. This may mean that the long-term debt requirements will be different for the two subindustry groups and must be accounted for in the equation. Within the SIC two-digit industry classification used in this analysis, there were 13 subindustry groups.[3] In order to indicate in which subindustry group each firm was located, 12 dummy variables (1 indicating presence in group, 0 indicating nonpresence) had to be used in the equation.[4] The subindustry groups were neither equal in number of firms nor balanced with respect to the number of entrepreneurial and managerial firms. There were, however, at least one managerial and one entrepreneurial firm in each group.[5] A subindustry group which has a positive and significant coefficient would be directly related to the ratio in the dependent variable. The significance of the 14 independent variables individually was determined by the t-statistic for each of the

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[3]A list of firms and their subindustry groups appears in Appendix A.

[4]The coefficient for the 13th group can be found by subtracting the mean of the dependent variable from the coefficient of the intercept.

[5]The 13th subindustry group consisted of six firms that were in a group that did not have at least one managerial and one entrepreneurial firm.

coefficients. In addition, the significance of the 12 subindustry variables can be determined jointly by comparing the equation with one which omits the subinduatry variables.[6]

Stockholders' Wealth Versus Rate of Return

Stockholder's Wealth

The first hypothesis tested in this analysis was the question of whether entrepreneurial or managerial firms yielded a larger quantity of wealth for their stockholders. The dependent variable in the first set of equations was the stockholders' wealth/asset (W/A) variable. Stockholders' wealth (W) as the total average annual dividends paid plus the total average annual market value of the outstanding common stock for each firm.[7] The first equation in Table 1 represents the statistical results from Hypothesis 1. It can be observed that control type is insignificant in Equation 1. In fact, the control variable has a negative sign indicating that if it were significant, wealth would be

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[6] A F-test is used to determine their joint significance. The result of the test appears after each equation in all three tables.

[7] It was pointed out at the end of Chapter IV that each data item represents an 11-year average covering the period from 1960 to 1970. Time is, therefore, eliminated from the analysis.

positively related to the managerial firm group. Null Hypothesis 1 cannot be rejected on the basis of these results, and it must be concluded that there is no significant difference between the stockholders' wealth of the managerial firms and the stockholders' wealth of the entrepreneurial firms in this study.

The quantitative variable, firm size (assets), also appears to be an insignificant determinant of stockholders' wealth. This means that differences in the asset sizes of the firms in the sample did not have a significant impact on the wealth/asset variable.

The size-control interaction variable was also insignificant in Equation 1. This implies that there was no significant difference in an increase in wealth brought about by an increase in the size of an entrepreneurial or managerial firm. Therefore both firm size and the interaction between firm size and type of control appear to be unimportant determinants of the wealth variable.

In addition, the concentration ratio was an insignificant determinant of stockholders' wealth. This implies that the size of the wealth variable is not significantly affected by the competitive environment in which these firms operate as measured by the concentration ratio.

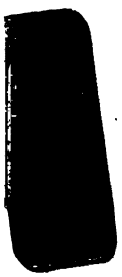
The 12 variables representing the subindustry groups are significant in the first equation. The F-value

is significant at the 5 percent level signifying that the subindustry classifications, as a group, are an important determinant of the wealth variable. In Equation 1, five of the coefficients on individual subindustry groups are significant at the 5 percent level or better. A closer examination of one of the groups (confectionary firm group 9) reveals that three out of the five firms in the group were classified as entrepreneurial firms.[8] These firms had a significant portion of their stock controlled by one or two owners which clearly put them into the entrepreneurial firm classification. The fact that these firms were highly owner controlled may account for the strong relationship between the wealth variable and this particular subindustry group.

Rate of Return

The second hypothesis tested in this study deals with the question of whether the net income/net worth

[8]The three firms were Hershey Foods Corp., Tootsie Roll Industries, and Wm. Wrigley, Jr., Co. All three firms had specific evidence revealing that they were highly owner controlled. For example, Hershey Foods Corp. has 66% of its common stock owned by the Milton Hershey Trust. In addition one of the firms (Fanny Farmers) classified as managerial controlled had 38% of its stock owned by the Amoskeog Co. Since the Amoskeog Co. appeared to be managerial, Fanny Farmers was put into the managerial control group. However, since a large portion of the stock was owned by another company it is possible that Fanny Farmer was actually operated as if it were entrepreneurial controlled which would tend to increase the wealth variable for this subindustry group.



(NI/NW) of entrepreneurial firms is greater than the NI/NW of managerial firms.[9] The NI/NW variable was often used in other studies to represent the maximand for entrepreneurial firms. It has been hypothesized in this analysis that entrepreneurial firms maximize stockholders' interests by maximizing wealth (dividends per share plus stock price) and this definition of stockholders' wealth better represents the interests of owners than does NI/NW. The results for Hypothesis 2 appear in Equation 2 in Table 1. It can be observed that the control variable is significant (at the 10% level) in Equation 2. The negative sign attached to the coefficient on the control variable implies that NI/NW is positively related to the managerial firm group. This result does not support the alternative hypothesis that NI/NW is greater for entrepreneurial firms than it is for managerial firms. Therefore, the alternative hypothesis can be rejected and it must be concluded that, given this sample of firms, NI/NW is larger for managerial firms.

The firm size variable in Equation 2 is insignificant indicating that NI/NW is not affected by the size of the firms used in this study. This result is consistent with the one that was achieved when stockholders' wealth was used as the dependent variable. This means that

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[9]The net income is before taxes and the net worth is stockholders' equity.

differences in firm size do not have an impact on either stockholders' wealth or the NI/NW variable for the firms in this sample.

The size-control interaction variable was also insignificant in this equation. This indicates that a change in the NI/NW variable brought about by a change in firm size is similar for both entrepreneurial and managerial firms.

The eight-firm concentration ratio is also insignificant in this equation. The competitive environment, therefore, does not appear to have an effect upon the size of the NI/NW variable for firms in the food and beverage industry.

The subindustry variables, as a group, also have an insignificant effect upon the NI/NW variable. The F-value (1.57) is insignificant indicating that the joint subindustry effect is an unimportant determinant of NI/NW. While the subindustry variables as a group have an insignificant effect upon NI/NW, three individual subindustry variables are significant at the 5 percent level. This would indicate that the firms in these three classifications have a relatively stronger effect on the NI/NW variable than the firms in the other nine groups. The confectionary subindustry group, which had a highly significant relationship with stockholders' wealth, is also one of the significant groups in this analysis.

The level of significance, however, indicates a much stronger relationship with stockholders' wealth than it does with NI/NW.

Wealth vs. NI/NW

In order to make a comparison of the two entrepreneurial firm maximands, a third equation was estimated to test Hypothesis 3 (i.e., stockholders' wealth is a better form of an entrepreneurial firm's maximand than NI/NW). The dependent variable in the equation was the difference between the stockholders' wealth/asset variable divided by its standard deviation and the NI/NW variable divided by its standard deviation. Each previous dependent variable was divided by its respective standard deviation in order to scale the ratios to take account of differences in the size of the changes of both variables. The difference between the two scaled variables, therefore, provides a direct

$$\frac{W/A}{s.d.} - \frac{NI/NW}{s.d.} = \text{dependent variable} \qquad [2]$$

test of whether the objective function of entrepreneurial firms is better represented by stockholders' wealth or the rate of return variable NI/NW.

If an entrepreneurial firm maximizes NI/NW, it is maximizing the rate of return on the stockholders' investment in the firm. This variable, however, may not

fully represent the stockholders' total interests in the firm. Presumably stockholders are interested in both the dividend payment they will receive and the price of the stock which they own. Maximizing NI/NW may have a direct effect upon the dividend payment, but it does not appear to explicitly effect the price of the stock. Maximizing the stockholders' wealth variable, however, explicitly includes the maximization of both dividends and stock price and should therefore be a better representation of the stockholders' interests than the NI/NW variable.

The results of testing Hypothesis 3 appear in Table 1, Equation 3. The control variable in the equation is significant. The sign on the control coefficient is positive implying that the difference between stockholders' wealth and NI/NW is significantly related to the entrepreneurial firm group. This means that the entrepreneurial firms in the sample tended to maximize stockholders' wealth rather than NI/NW. Therefore, this result supports the alternative hypothesis that stockholders' wealth is a better representation of an entrepreneurial firm's maximand than is NI/NW.

The size variable in Equation 3 is insignificant in this equation. The negative sign on the coefficients may mean that small firms produce a larger wealth variable than they do a NI/NW variable. If it is assumed that small firms tend to be more entrepreneurial in nature

than large firms, it may be able to be concluded that owner-controlled firms maximize stockholders' wealth much more so than NI/NW.

The size-control variable was insignificant in Equation 3 as was the concentration ratio variable. This means that the difference between wealth and NI/NW is unaffected by the size-control interaction and the competitive environment of the firms.

The subindustry variables, as a group, do not appear to have a significant effect upon the dependent variable in this analysis. The F-value (1.41) is insignificant, and all but three of the individual subindustry variables are also insignificant in the equation. Again the coefficient for subindustry nine (confectionary firms) is significant implying that the firms in this group tend to have a larger wealth variable than a NI/NW variable. These results are also consistent with the previous findings, and given the make-up of this subindustry group, they lend slight support to the maximand of stockholders' wealth.

While the evidence is not conclusive, it does appear that the stockholders' wealth variable may be a slightly better representation of an entrepreneurial firm's maximand than the rate of return variable of NI/NW for the firms in the food and beverage industry. This

conclusion rests mainly on the fact that the difference between W/A and NI/NW tended to be related to the entrepreneurial firm group. This result implies that entrepreneurial firms tend to maximize stockholders' wealth rather than NI/NW, and therefore the specification of an entrepreneurial firm should include stockholders' wealth in the firms' objective function.

Firm Decision Variables

Variable Input

There were four hypotheses tested in this study that dealt with decisions on the operation and financing of the firm. The first hypothesis tested in this section stated that the average productivity of labor for entrepreneurial firms (AP_L^E) was greater than the average productivity of labor for (AP_L^M) managerial firms (alternative hypothesis 4). Two different dependent variables were developed to examine the average productivity of labor for firms in this study. The first dependent variable was the average annual ratio of net sales (NS) to number of employees in the firm (E). This ratio (NS/E) provided a crude approximation of average labor productivity as it calculates the amount of goods that are sold for every person that is employed by the firm. The results of the regression analysis for this dependent variable appear in Equation 1 in Table 2. The control variable is

insignificant in this first equation. The sign on the control coefficient is positive indicating that the size of the NS/E ratio may be directly related to the entrepreneurial firm group. However, given the insignificant control coefficient this result does not lend much support to the hypothesis that managerial firms have a tendency to overuse the variable input. Therefore, the null hypothesis that $AP_L^M = AP_L^E$ must be accepted.

The size coefficient in Equation 1 is insignificant indicating that size alone is not an important determinant of the NS/E ratio. The size-control interaction variable is also insignificant in this equation indicating that the two variables together do not have an important effect upon the NS/E ratio.

The concentration ratio variable is highly significant in this equation indicating that a low NS/E ratio is related to a high concentration ratio for the firms in this sample. This result might be expected since a less competitive environment would tend to allow firms to behave less efficiently which may reflect itself in a lower average product of labor. Managerial firms, however, also must operate in a less competitive environment, so it could be expected that they would tend to have a lower AP_L than entrepreneurial firms. This contention is substantiated somewhat by the results of a regression equation computed with the same variables except the

concentration ratio.[9] The control variable in this equation was significant at the 5 percent level indicating that entrepreneurial firms had a significantly greater NS/E than did managerial firms.

The subindustry variables as a group had a significant effect upon the NS/E ratio. The F-value (4.20) was significant at the 1 percent level indicating that the joint effect of the subindustry variables was important in this equation. In addition, 11 of the 12 individual subindustry variables had significant coefficients. Ten of the subindustry groups had coefficients that were negatively related to NS/E implying that, on average, the firms in these groups had a low AP_L. Subindustry 3 was positively related to NS/E indicating that those firms had a high AP_L during the period under review.[10]

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[9]The equation was

$$NS/E = \underset{}{44.595} + \underset{(5.451)}{12.567C^*} + \underset{(0.592)}{0.873Z} - \underset{(-1.123)}{2.757CZ} - \underset{(-1.270)}{13.174D_1} + \underset{(-0.198)}{2.377D_2} - \underset{(-0.920)}{10.896D_3} - \underset{(-0.988)}{10.657D_4} + \underset{(0.923)}{1.153D_5} - \underset{(-0.697)}{9.881D_6} - \underset{(-2.032)}{27.763D_7^{**}} + \underset{(2.343)}{29.202D_8^{**}} - \underset{(-1.417)}{16.631D_9} - \underset{(-0.512)}{5.434D_{10}} - \underset{(-0.824)}{8.88D_{11}} - \underset{(-0.169)}{2.310D_{12}} + u.$$

[10]This group is the dairy products firms.

The second dependent variable used to examine the hypothesis that managerial firms tend to overuse the variable input was the total labor expense to net sales ratio (LE/NS) for each firm in the study. While this ratio does not provide a measure of productivity, it does indicate the amount of labor expense for every dollar of net sales. If the original hypothesis is correct it could be expected that the LS/NE ratio would be higher for managerial firms than it is for entrepreneurial firms. The results from this test appear in Equation 2 in Table 2. The control variable is insignificant in this equation. The sign on the control coefficient is negative implying that managerial firms may have a larger LE/NS than the entrepreneurial firms. Since this result is insignificant, however, it does not lend much support to the hypothesis that managerial firms tend to overuse the labor input relative to entrepreneurial firms.

The size variable coefficient is insignificant in Equation 2, but it does have a positive sign indicating that larger firms may tend to have higher LE/NS ratios than smaller firms. This may be consistent with the contention that relatively large firms tend to be more managerial in nature than smaller firms. The relationship between size and control, however, is also insignificant as it was in the previous equation. This implies that a

change in firm size will have a similar effect upon LE/NS for both entrepreneurial and managerial firms.

The concentration ratio was significant in this equation indicating that a relatively high LE/NS ratio is associated with high level of concentration. This result is consistent with economic theory since firms operating in a less competitive environment would have the opportunity to be less efficient and therefore may have a higher LE/NS ratio. As in the previous equation, it could be expected that since managerial firms tend to operate in less competitive environments, they would have higher LE/NS ratio than would entrepreneurial firms. This contention, however, cannot be supported as substantially as the contention concerning the NS/E ratio.

The F-value for Equation 2 reveals that the sub-industry variables, as a group, also have an insignificant effect upon the LE/NS ratio. Two of the individual sub-industry group variables are significant, however, implying that the firms in these groups do have an important effect upon LE/NS.

Overall, it doesappear that entrepreneurial firms tend to produce a slightly higher net sales per employee, but they do not have a significant different labor expense per dollar of sales than managerial firms. This does lend some support for the hypothesis that managerial

firms tend to overuse the variable input relative to entrepreneurial firms in the food and beverage industry.

Financial Decisions

Debt.--There were three hypotheses tested in this study that dealt with the firm's financial decisions (null hypotheses 5, 6, and 7 in Chapter IV). The first hypothesis (alternative hypothesis 5) stated that the quantity of debt held by entrepreneurial firms would not equal the quantity of debt held by managerial firms. The debt variable in this analysis was defined in two ways: first, it was defined as the sum of short-term liabilities and long-term debt (D_1), and secondly as just long-term debt (D_2).[11] Debt in both cases was divided by the total assets (A) of each firm in order to normalize it for firm size. Two equations using the different definitions of debt were estimated and the results appear in Equations 1 and 2 in Table 3. The control variable is significant at the 10 percent level in both equations, and the negative sign accompanying the coefficients means that a larger quantity of debt is being held by managerial firms.[12] Therefore, it can be concluded that the empirical evidence tends to indicate that managerial firms in the food and beverage industry use a relatively larger quantity of

[11]Long-term debt includes preferred stock.

[12]The control coefficient in Equation 1 is almost significant at the 5 percent level.

external debt financing in order to pursue their objective of firm growth than do entrepreneurial firms.

The size variable coefficients in Equations 1 and 2 are insignificant although the signs on both coefficients are negative. This implies that the quantity of debt relative to assets is not dependent upon the size of the firm. This is, large firms do not appear to hold greater quantities of debt relative to their size than do small firms. While this result is somewhat inconsistent with the previous contention that large firms tend to be more managerial in nature than small firms, it may only imply that there are no economies of scale in debt financing, and as firms get larger they tend to keep the same proportion of debt in their financial structure. It could also imply that if there are economies of scale in debt financing, large firms (managerial types) tend to ignore the economies and continue to maintain a high proportion of debt in order to pursue their objective of maximizing firm size.

The size-control interaction variable was also insignificant in both Equations 1 and 2. The sign on the coefficient is position in both cases implying that an increase in the size of an entrepreneurial firm may have a slight tendency to increase the debt/asset ratio more than an increase in the size of a managerial firm.

The concentration ratio was insignificant implying that the decision of how much debt to hold in the firm's financial structure may not be affected by the firm's competitive environment.

The subindustry variables, as a group, appear to have an important effect upon the debt/asset ratio in Equation 1 but not in Equation 2. The F-value (2.66) in Equation 1 is significant at the 5 percent level indicating that the subindustry effect is an important determinant of the debt/asset ratio. This result may imply that there are different capital requirements for specific subindustry groups in this sample, and therefore, the quantity of debt held by these firms will be affected by the varying requirements. There were three individual subindustry variables significant in Equations 1 and two significant in Equation 2. The most highly significant subindustry variable is the confectionary group (9). The negative sign on the coefficients indicates that firms in this subindustry had a relatively low average debt/asset ratio over the period. This result is similar to earlier findings on the confectionary group.

Retained earnings.--The second hypothesis set forth in the financial decision group deals with the proportion of earnings retained out of profit by entrepreneurial and managerial firms. The alternative hypothesis stated that managerial firms would have an incentive to retain a larger

share of their net profit in the firm than entrepreneurial firms (alternative hypothesis 6). The dependent variable for this analysis is the average annual retained earnings/net profit (before taxes) ratio for each firm. The statistical results appear in Equation 3 in Table 3. The control variable coefficient is insignificant in the equation indicating that there is little difference in the retained earnings/profit ratio for managerial and entrepreneurial firms. The alternative hypothesis must therefore be rejected for firms in this sample.

The size variable coefficient in Equation 3 is significantly related to the dependent variable. The negative sign on the coefficient implies that small firms tend to withhold a larger proportion of their profit as retained earnings than do large firms. This result is not surprising since small firms have less access to capital markets than large firms and would therefore need to raise more of their money capital internally. However, assuming that small firms tend to be more entrepreneurial in nature than large firms, this result would imply that entrepreneurial firms tend to retain a larger portion of their earnings than do managerial firms.

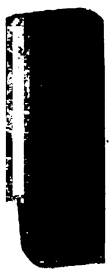
This result may also shed some interesting light upon the contention of Friedman (13) that entrepreneurial firms have a tax incentive to retain a larger share of their profits than managerial firms. It was maintained

in footnote 7 in Chapter III, that Friedman's contention may be true for closely held firms, but in general entrepreneurial firms would not be able to make an optimal dividends-retained earnings decision for all their stockholders. The negative relationship between firm size and the ρ/π ratio in this study may support the Friedman contention for the small closely held firms. That is, small firms would tend to be more closely-held than large firms and therefore would be better able to make an optimal dividends-retained earnings decision for their stockholders. Since, in most cases controlling stockholders of these firms would probably prefer capital gains, it could be expected that the ρ/π ratio would be higher for smaller (closely held) firms than it would be for larger firms. While this result is not conclusive, the evidence does lend slight support to this contention.

The size-control interaction variable was an insignificant determinant of the ρ/π ratio. While size alone was important in this equation, the interaction between the two variables did not significantly affect the ρ/π ratio. The concentration ratio was also an insignificant determinant of the ρ/π ratio. This implies that the retained earnings decision may be unaffected by the competitive environment of the industries in which these firms operate.

The subindustry variables, individually, or as a group, are also insignificant in Equation 3. This implies that there is little difference in the ρ/π ratio among the subindustry groups in this sample.

Firm leverage.--The third hypothesis dealing with financial decisions in this study was the examination of the firms' leverage ratio (debt/equity). It was stated in Chapter IV that if the two alternative hypotheses dealing with debt and retained earnings were accepted, there would be uncertainty as to whether entrepreneurial or managerial firms had the larger debt/equity ratio. Since the debt hypothesis indicated that managerial firms hold a larger quantity of debt than entrepreneurial firms and the retained earnings hypothesis was rejected, it can be hypothesized that the leverage ratio should be larger for the managerial firms in this study than it is for the entrepreneurial firms (alternative hypothesis 7). The dependent variable in the analysis was the average debt (D) to stockholders' equity (K) (book value of common stock plus retained earnings) ratio for each firm. Debt was defined in the same two ways as it is in Equations 1 and 2. Both specifications of the debt/equity ratio were used in this analysis and the D_1/K results appear in Equation 4 and D_2/K results in Equation 5 in Table 3. The coefficients of the control variables in both equations



are significant and have a negative sign implying that the managerial firms have a larger D/K ratio than entrepreneurial firms. This finding is consistent with the debt and retained earning results and supports the hypothesis that managerial firms make greater use of leverage than entrepreneurial firms.[13]

The size variable is significant at the 10 percent level in Equation 4 but is insignificant in Equation 5. The negative sign in the coefficient indicates that large firms tend to have a lower D/K ratio. This result does not support the contention that large firms tend to be more managerial in nature than small firms, but it may indicate that there is an upper limit on the leverage ratio for all firms, regardless of size or control.

The interaction variable is insignificant in both Equations 4 and 5 indicating that the combined effect of size and control may not be an important determinant of the leverage ratio. The concentration ratio is also insignificant in both equations. This is consistent with earlier findings on debt and indicates that the leverage ratio is not affected by the competitive environment of the firms in this sample.

The subindustry variables, as a group, also have an insignificant effect upon the D/K ratio. This result

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[13]These results are supported by Weston (47) in his analysis of conglomerate firms and by Monsen (33).

held regardless of the definition of debt. One individual subindustry variable was significant at the 10 percent level and had a negative sign in Equation 5 implying that firms in this group had relatively small D_2/K ratios. This subindustry was again the confectionary group (9) indicating that these firms had relatively low long-term debt leverage ratio. This is consistent with the earlier findings concerning this group.

Overall, the results from the analysis of the financial decision variables seem to indicate that managerial firms in the food and beverage industry hold a larger quantity of debt in their financial structure than do entrepreneurial firms. At the same time, entrepreneurial and managerial firms tended to retain the same proportion of their earnings in the firm. Small firms tended to withhold a larger proportion of their earnings than did large firms, but this could be expected since small firms do not have easy access to capital markets. These two results were supported by the finding that managerial firms appear to operate with a higher leverage ratio than entrepreneurial firms.

TABLE 1.--Statistical results

Dependent Variable	Intercept	Control	Size	Control x Size	Concentration Ratio			
					1	2	3	4
(1) W/A	- .356E-04	[illegible]	.630E-06	[illegible]	- .118E-06	.127E-04*	.746E-05	.947E-06	.258E-05
	(- .635)	(- .461)	(.331)	([illegible])	([illegible])	(2.41[illegible])	(.71[illegible])	(.126)	(.56[illegible])
(2) NI/NW	.105	- [illegible]*	- [illegible]	[illegible]	[illegible]	.13[illegible]	[illegible]	.085	- [illegible]
	(.107)	(-1.6[illegible])	(- .239)	([illegible])	([illegible])	([illegible])	(.141)	([illegible])	(- .003)
(3) W/S - NI/NW	- .819	[illegible]*	[illegible]	- [illegible]	- [illegible]	- [illegible]	- [illegible]	- [illegible]	[illegible]
	(- .113)	([illegible])	(.244)	(- [illegible])	(- [illegible])	(-[illegible])	(- .13[illegible])	(- [illegible])	([illegible])

*Significant at 10% level.
**Significant at 5% level.
NOTE: Numbers in parentheses are t-values.

TABLE 2.--Statistical results.

Dependent Variable	Intercept	Control	Size	Control x Size	Concentration Ratio			
					1	2	3	4
(1) [illegible]	[illegible]	4.[illegible]	- .42[illegible]	-[illegible]	-[illegible]**	-[illegible]**	-[illegible]**	52.033**	-33.234**
	([illegible])	([illegible])	(- [illegible])	(- [illegible])	-4.[illegible]	(-4.[illegible])	(-4.3[illegible])	(3.126)	(-3.216)
(2) LE/NS	- 1.423	- [illegible]	[illegible]	[illegible]	[illegible]*	- [illegible]	.23[illegible]	- .226*	- .058
	(- 1.[illegible])	(-1.[illegible])	([illegible])	([illegible])	([illegible])	(- [illegible])	(1.4[illegible])	(-1.[illegible])	(- .832)

*Significant at 10% level.
**Significant at 5% level.
NOTE: Numbers in parentheses are t-values.

TABLE 3.--Statistical results.

Dependent Variable	Intercept	Control	Size	Control x Size	Concentration Ratio			
					1	2	3	4
(1) [illegible]/A	1.40[illegible]	- [illegible]**	- [illegible]	[illegible]	- [illegible]	- [illegible]	- [illegible]	[illegible]	.04[illegible]
	(1.434)	(-[illegible])	(-1.[illegible])	([illegible])	(- [illegible])	(- [illegible])	(-1.[illegible])	(.432)	([illegible])
(2) [illegible]/A	.414	- [illegible]*	- [illegible]	[illegible]	- [illegible]	- [illegible]	- [illegible]	- [illegible]	[illegible]
	(.46[illegible])	(-1.[illegible])	(- [illegible])	([illegible])	(- [illegible])	(- [illegible])	(- [illegible])	(- [illegible])	([illegible])
(3) [illegible]	- [illegible]	[illegible]	- [illegible]*	.64[illegible]	[illegible]	.32[illegible]	[illegible]44	- .364	[illegible]
	(- [illegible])	([illegible])	(-1.[illegible])	(.7[illegible])	([illegible])	([illegible])	([illegible])	(- .785)	([illegible])
(4) [illegible]/E	- [illegible]	- [illegible]*	- [illegible]*	[illegible]	[illegible]	[illegible]	[illegible]	- .245	.45[illegible]
	(- [illegible])	(-1.[illegible])	(-1.[illegible])	([illegible])	([illegible])	(1.[illegible])	([illegible])	(- .356)	(1.291)
(5) [illegible]/F	- [illegible]	- [illegible]*	- [illegible]	[illegible]	[illegible]	.225	[illegible]44	- .207	.13[illegible]
	(- .22[illegible])	(-1.[illegible])	(- [illegible])	([illegible])	(.44[illegible])	([illegible])	(.[illegible]92)	(- .598)	(.64[illegible])

*Significant at 10% level.
**Significant at 5% level.
NOTE: Numbers in parentheses are t-values.

Subindustry Groups								R^2	F
5	6	7	8	9	10	11	12		
.976E-05	.116E-04*	.433E-05	- .120E-04	.158E-04*	.981E-05*	.354E-05	.279E-04*	48.2	2.74**
(1.544)	(1.764)	(.762)	(- .867)	(3.508)	(2.129)	(.757)	(4.857)		
.093	.125	.060	.000	.144*	.147*	.091	.263**	28.6	1.57
(.838)	(1.079)	(.610)	(.003)	(1.819)	(1.827)	(1.[illegible])	(2.[illegible]64)		
- .176	- .910	- .444	- .021	-1.047*	-1.[illegible]	- [illegible]	-1.911**	28.4	1.41
(- .829)	(-1.069)	(- .697)	(- .011)	(-1.799)	(-1.819)	(-1.[illegible])	(-2.576)		

Subindustry Groups									
5	6	7	8	9	10	11	12		
-42.494**	-49.643**	-4.439	167.000**	-21.434**	-28.233**	-31.936	-28.028**	51.2	4.2*
(-3.023)	(- 3.383)	(- .350)	(5.409)	(- 2.134)	(- 2.764)	(- 3.077)	(- 2.195)		
- .062	.036	- .087	- .525**	- .104	- .010	- .114	- .080	29.7	1.57
(- .637)	(.353)	(- .990)	(- 2.445)	(- 1.494)	(.145)	(- 1.584)	(- .905)		

Subindustry Groups								R^2	F
5	6	7	8	9	10	11	12		
- .124	- .142	- .080	.251	- .252**	- .201**	- .047	- .243**	41.0	2.66**
(-1.056)	(-1.161)	(- .758)	(.372)	(-3.006)	(-2.345)	(-.493)	(-2.271)		
- .032	- .052	- .039	.078	- .139**	- .096	- [illegible]	- .171*	29.6	1.22
(- .339)	(- .523)	(- .456)	(.371)	(-2.531)	(-1.388)	(- [illegible])	(-1.965)		
.305	.179	- .093	- .166	- .069	- .011	.260	- .028	22.6	0.68
(.779)	(.437)	(- .266)	(- .193)	(- .247)	(- .038)	(.890)	(- .079)		
- .131	- .032	- .467	- .244	- .645	- .358	.189	- .578	28.7	1.43
(- .226)	(- .052)	(- .895)	(- .191)	(-1.754)	(- .647)	(.441)	(-1.093)		
- .035	- .022	- .247	- .153	- .336*	- .162	.113	- .364	29.0	1.34
(- .120)	(- .074)	(- .945)	(- .284)	(-1.[illegible])	(- [illegible])	(.522)	(-1.365)		

CHAPTER VI

SUMMARY AND CONCLUSIONS

Introduction

The purpose of this thesis was to systematically examine the differences in behavior of entrepreneurial and managerial firms. An entrepreneurial firm is defined as a firm that is operated only in the interests of the owners, while a managerial firm is defined as one that is operated at the expense of the owners' interests. This implies that entrepreneurial firms are operated to maximize the utility function of the owners, while managerial firms are operated to maximize the managers' utility. Since both utility functions contain different arguments, it can be expected that differences in behavior will arise between entrepreneurial and managerial firms.

Theory of Entrepreneurial and Managerial Firms

In the theory of the entrepreneurial firm, it is assumed that the owners' (stockholders) utility is a function of their wealth. Stockholders' wealth was defined as the dividends received in a time period plus the market price of stock during the period. A firm

operated strictly in the interests of its owners, therefore, maximizes stockholders' wealth which in turn, yields solutions for magnitudes of decision variables. These decision variables indicated the optimal quantities of the fixed and variable factor inputs, the optimal quantity of debt to be held in the firm's financial structure and the optimal amount of earnings to be retained in the firm.

The solutions of these four decision variables were compared to the generalized theory of a managerial firm as specified by other authors (2,31,34,48). It was assumed that the individuals operating a managerial firm had the latitude to make discretionary decisions in the firm that will lead to the maximization of their own utility. Since the managers' utility is assumed to be a function of their income, status, and power (16), it can be expected that the discretionary decisions will cause the behavior of a managerial firm to differ from that of an entrepreneurial firm.

It has been hypothesized that a managers' income, status, and power is a function of firms sales (2), the growth rate of the firm (31), and certain expense components (48). The maximization of one or more of these variables yield general results for the decisions on factor inputs, level of debt, and retained earnings which are different than the decisions of entrepreneurial firms.

The two sets of decisions were compared and seven hypotheses were developed concerning differences in entrepreneurial and managerial firm behavior. It was hypothesized that (1) stockholders' wealth is greater for entrepreneurial firms than for managerial firms, (2) net income/net worth is greater for entrepreneurial firms than managerial firms, (3) stockholders' wealth is a better representation of an entrepreneurial firm maximand than net income/net worth, (4) the average product of labor is greater for entrepreneurial firms, (5) the quantity of debt held by entrepreneurial firms is not equal to the quantity held by managerial firms, (6) the retained earnings/profit ratio is greater for managerial firms, and (7) the debt/equity ratio of entrepreneurial firms is not equal to the D/K ratio of managerial firms.

Empirical Results

In order to test the seven hypotheses a sample of the firms were selected from the food and beverage industry (SIC industrial classification 20). The firms were selected from one industrial classification in order to hold conditions constant across the sample of firms. Previous studies (7,26,33,45) have classified entrepreneurial and managerial firms by examining the share ownership of each firm. Using a similar technique, the 74 firms in this study were classified into two groups of 37 entrepreneurial and managerial firms each.

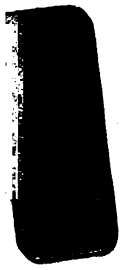
Testing the seven hypotheses revealed the following results. It was found that there was no significant difference between the stockholders' wealth of entrepreneurial and managerial firms. The alternative hypothesis that entrepreneurial firms would have a larger wealth variable than managerial firms was therefore rejected. However, the net income/net worth ratio of managerial firms was found to be greater than it was for entrepreneurial firms. This contradicts the alternative hypothesis that entrepreneurial firms would have a larger NI/NW variable than managerial firms. In fact these results indicated that managerial firms appear to be maximizing NI/NW, to a greater extent than the entrepreneurial firms in the sample. The difference between stockholders' wealth and NI/NW was found to be positively associated with the entrepreneurial firm group. This indicated that entrepreneurial firms maximized stockholders' wealth to a greater extent than they maximize NI/NW. This tended to support the hypothesis that stockholders' wealth is a better representation of an entrepreneurial firm's maximand than NI/NW.

The results from the firm decision variable hypotheses indicated that the net sales/total employees ratio (average product of labor) had a tendency to be slightly greater for entrepreneurial firms. This result, however, was not significant because of the presence of the concentration ratio in the equation. However, the

significant concentration ratio variable indicated that the NS/E ratio was lower in subindustry groups with relatively high concentration. A second decision variable hypothesis indicated that managerial firms tended to hold a significantly larger quantity of debt in their financial structure than did entrepreneurial firms. This result held regardless of the definition of debt. In a third decision variable hypothesis, it was found that there was no significant difference in the retained earnings/profit ratio for entrepreneurial and managerial firms. Small firms retained a significantly larger amount of profit than did large firms, but this could be expected since small firms need to finance internally more so than large firms. The last hypothesis tested indicated that the debt/equity ratio was significantly higher for managerial firms than it was for entrepreneurial firms. This result supported the earlier debt finding, and revealed that managerial firms in the food and beverage industry tended to have a higher leverage ratio than entrepreneurial firms.

Conclusions

This study found differences between entrepreneurial and managerial firm behavior; however, the strength of these differences in some cases was not remarkably significant. It was found that there was no significant difference in the stockholders' wealth variable, for the two types of firms, but some differences



appear in the use of variable inputs and in the debt and leverage ratios.

Overall, it can be concluded that entrepreneurial firms in this study behaved differently, in some respects, than the managerial firms. However, the significance of these differences for the firm owners is not entirely clear since even though the firms appeared to be operated differently, the stockholders' wealth variable for both types of firms was essentially the same. This may have two possible explanations. First, while managerial firms in this study were able to maintain a satisfactory level of stockholders' wealth, they were, at the same time, able to maximize the managers' utility. Secondly, it may mean that since managerial firms appear to hold a relatively large quantity of external debt (hypothesis 4), they are constrained by the capital market to operate efficiently in order to obtain this debt. Operating efficiently may mean that the managerial firms effectively maximized stockholders' wealth as did entrepreneurial firms. Therefore, even though some of the desicion variables indicated differences in entrepreneurial and managerial firm behavior, both types of firms appeared to be operating in the owners' interests.

An alternative explanation of these results could center around the problem of choosing an adequate sample

of entrepreneurial and managerial firm for the study. The classification of the firms as managerial or entrepreneurial was undertaken as in other studies (7,26,34,45), strictly on the basis of share ownership and evidence of control. Nearly all of both types of firms in the sample were large[1] and well-established which means that they had developed large bureaucratic management structures to cope with their administrative problems. This further implies that even though the entrepreneurial firms were controlled by one person, group, or family, their management structures were also large and well developed causing some control loss and therefore the goal of maximizing stockholders' wealth may have become modified. What this suggests possibly is that the theory of the managerial firm may really be the theory of the large bureaucratic firm and a large firm's behavior may be primarily a function of its size rather than entirely of separation of ownership and control.[2] However, this conclusion may only be applied to firms in the food and beverage industry, and additional tests in other industries must be completed before any generalized conclusions can be made concerning entrepreneurial and managerial firm behavior.

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[1] On average, managerial firms were slightly larger in asset size than entrepreneurial firms.

[2] Radice (36) reaches basically a similar conclusion in his study.

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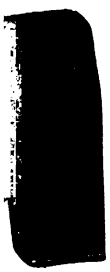
APPENDICES

APPENDIX A

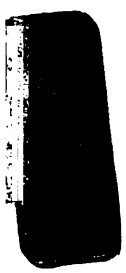
SAMPLE OF FIRMS



APPENDIX A

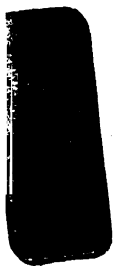
SAMPLE OF FIRMS

Firm Name		Control	Subindustry
1.	General Foods Corp.	M	1. Package Foods
2.	General Mills Inc.	M	
3.	Gerber Products Co.	E	
4.	Kellogg Co.	E	
5.	Norton Simon Inc.	M	
6.	Pillsbury Co.	E	
7.	Quaker Oats Co.	M	
8.	Smucker Co.	E	
9.	Standard Brands Inc.	M	
10.	United Foods Inc.	M	
11.	Hormel Co.	E	2. Meat Packers
12.	Hygrade Food Products Corp.	M	
13.	Mayer Co.	E	
14.	Swift and Co.	M	
15.	Tobin Packing Co., Inc.	E	
16.	Beatrice Foods Co.	M	3. Dairy Products
17.	Borden Inc.	M	
18.	Carnation Co.	E	
19.	Fairmont Foods Co.	M	
20.	Kraftco Corp.	M	
21.	Pet Inc.	M	
22.	Campbell Soup Co.	E	4. Canned Foods
23.	Castle and Cooke Inc.	M	
24.	Del Monte Corp.	M	
25.	DiGiorgio Corp.	E	
26.	Green Giant Co.	M	
27.	Heinz Co.	E	



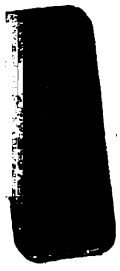
Firm Name		Control	Subindustry
28.	Libby McNeill & Libby Co.	E	
29.	Seabrook Foods Co.	E	
30.	Stokely-Van Camp Inc.	E	
31.	Allied Mills Inc.	M	5. Animal Foods
32.	Associated Products Inc.	M	
33.	National Alfalfa Dehydrating Co.	E	
34.	Ralston Purina Co.	E	
35.	CPC International Inc.	M	6. Corn Refineries
36.	National Starch & Chemical	E	
37.	Staley Manufacturing Co.	E	
38.	Helme Products Co.	M	7. Biscuit Bakers
39.	Keebler Co.	E	
40.	Nabisco Inc.	M	
41.	Amstar Corp.	E	8. Sugar-Beet and Cane Refiners
42.	Sucrest Corp.	E	
43.	Amalgamated Sugar Co.	M	
44.	American Crystal Sugar Co.	M	
45.	Fanny Farmer Candy Shops, Inc.	M	9. Confectionary
46.	Hershey Foods Corp.	E	
47.	Peter Paul Inc.	M	
48.	Tootsie Roll Industries Inc.	E	
49.	Wrigley Co.	E	
50.	Anheuser Busch Inc.	E	10. Brewers
51.	Duquesne Brewing Co.	E	
52.	Falstaff Brewing Corp.	E	
53.	Heileman Brewing Co.	M	
54.	Lone Star Brewing Co.	M	
55.	Molson Industries Ltd.	E	
56.	Olympia Brewing Co.	E	
57.	Schlitz Brewing Co.	E	

Firm Name	Control	Subindustry
58. American Distilling Co.	M	11. Distillers
59. Brown Forman Distillers	E	
60. Distillers Corp.-- Seagrams Ltd.	E	
61. Glenmore Distilleries Co.	E	
62. Heublein Inc.	M	
63. National Distillers	M	
64. Publicker Industries Inc.	E	
65. Walker Hiranm--Goodrhm & Wort Co.	M	
66. Coca-Cola Bottling Co. of New York	E	12. Soft Drinks
67. Dr. Pepper Co.	M	
68. Royal Crown Cola Co.	M	
69. Seaboard Allied Milling Co.	E	13. All Others
70. American Bakeries Co.	M	
71. Interstate Brands	M	
72. Tasty Baking Co.	M	
73. Ward Foods Inc.	M	
74. Archer-Daniels-Midland Co.	E	



APPENDIX B

CORRELATION MATRIX



APPENDIX B.--Correlation Matrix.

	W/A	NI/NW	NS/E	LE/NS	D1/A	D2/A	S/T	D1/K	D2/K	C	Z	CZ	R	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12
W/A	1.00	.73	-.03	.05	-.50	0.47	-.08	-.36	-.39	-.04	.01	.01	-.10	.19	-.16	-.01	-.17	.02	.05	-.01	-.21	.26	.06	-.13	.44
NI/NW		1.00	.05	.11	-.18	-.11	-.12	-.12	-.05	-.21	.04	-.06	-.01	.14	-.16	.05	0.25	.01	.02	-.02	-.11	.10	.11	.02	.27
NS/E			1.00	-.27	.09	-.00	-.00	.00	-.02	.19	-.10	.01	.04	-.12	.04	-.05	-.05	.07	.00	-.22	.41	-.12	.05	-.05	.11
LE/NS				1.00	-.06	.05	-.23	-.12	-.05	-.20	.11	-.04	.04	-.13	.11	.18	-.10	-.15	.03	.14	-.08	-.06	.03	-.18	-.09
D1/A					1.00	.85	.17	.86	.83	-.26	.05	-.09	.10	.14	-.08	.03	.27	.01	-.06	-.06	.12	-.32	-.27	.09	-.15
D2/A						1.00	.04	.66	.88	-.28	.15	-.05	.16	.12	-.11	.07	.12	.03	-.03	-.00	.14	-.25	-.21	.12	-.21
S/T							1.00	.24	.16	.18	-.23	.10	.16	.13	-.07	-.32	.08	.13	.00	-.05	-.01	-.03	-.01	.11	-.01
D1/K								1.00	.92	-.22	-.04	-.10	.04	.23	-.08	-.03	.19	-.04	-.07	-.08	.07	-.21	-.19	.06	-.11
D2/K									1.00	-.28	.04	-.09	.10	.22	-.09	-.01	.11	-.02	-.06	-.05	.11	-.21	-.19	.11	-.16
C										1.00	-.15	.54	-.17	-.08	.05	-.20	.17	-.01	.06	-.07	-.01	.05	.17	-.01	-.07
Z											1.00	.37	-.01	.16	-.01	.27	.03	-.06	.07	-.04	-.08	-.15	-.14	.15	-.15
CZ												1.00	-.07	-.06	-.07	-.06	.22	.04	-.03	-.08	-.01	-.04	.03	.15	-.09
R													1.00	-.29	-.47	.42	-.08	-.14	-.12	.14	.70	.03	-.08	-.08	-.05
D1														1.00	-.08	-.04	-.06	-.05	-.05	-.06	-.07	-.07	-.09	-.09	-.05
D2															1.00	-.08	-.09	-.06	-.05	-.05	-.06	-.10	-.09	-.09	-.05
D3																1.00	-.10	-.07	-.06	-.06	-.07	-.08	-.10	-.10	-.06
D4																	1.00	-.08	-.07	-.07	-.08	-.09	-.12	-.12	-.07
D5																		1.00	-.04	-.04	-.05	-.06	-.08	-.08	-.04
D6																			1.00	-.04	-.04	-.05	-.07	-.07	-.04
D7																				1.00	-.04	-.05	-.07	-.07	-.04
D8																					1.00	-.06	.08	-.08	-.04
D9																						1.00	-.09	-.09	-.05
D10																							1.00	-.12	-.07
D11																								1.00	-.07
D12																									1.00