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IN THE THEORY OF THE FIRM.

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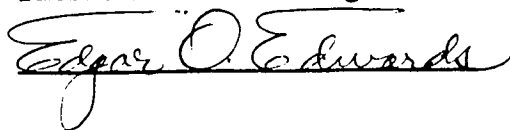
PROFIT AND RELATED OBJECTIVES
IN THE THEORY OF THE FIRM

by

Henderikus Geert Werkema

A THESIS SUBMITTED
IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

Thesis Director's signature:

A handwritten signature in dark ink, reading "Edgar O. Edwards". The signature is written in a cursive style with a large, prominent "E" and "D".

Houston, Texas

October, 1962

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CHAPTER I

INTRODUCTION

The Problem: Its Nature and Significance

The purpose of this study is to analyze the relationships which may exist between the making of profit and the pursuit of other objectives, especially growth, by the individual firm. For reasons which are not entirely obvious no such attempt has been made in the past. Important work has been done on the growth of the firm and even more on the phenomenon of profit. Yet these concepts have seldom been related to each other in a theoretical manner. Edith Penrose is probably the only economist who has done this explicitly.¹ The present analysis can be seen as an elaboration and extension of her short discussion of the problem.

Any attempt to investigate the connections between profit and growth on the micro-economic level is bound to meet with serious difficulties from the outset because one is confronted with a persistent disagreement about the nature and the determination of the value of one of the most crucial variables, namely, profit. In addition to this, there exists no clear and unambiguous definition of growth, and even the concept of the firm lacks a uniform

¹Edith Tilton Penrose, The Theory of the Growth of the Firm (New York: John Wiley & Sons, Inc., 1959), pp. 26-30. Cited hereafter as Theory of Growth.

interpretation. One finds, therefore, that there is no general agreement upon the set of tools appropriate in this analysis. Consequently it is necessary to pay considerable attention to the interpretation of the basic concepts. This holds especially for the interpretation of profit in both its ex-ante and its ex-post versions.

This study is strictly limited to the micro-economic level. References to post-keynesian theorists on macro-economic growth phenomena are, therefore, omitted. This is done because the firm or, rather, the "entrepreneur" which appears in macro-economic theory is ill-suited for an analysis of the growth of actually existing corporations. In fact, it is impossible to make any use of the results of the macro-economic line of thought in this study which deals exclusively with managerial decision making.¹ On the other hand, insight into micro-economic growth phenomena may stimulate the further development of the macro-economic theory of growth.

Mere curiosity may not always be accepted as a sufficient reason to deal with or, rather, write about a specific problem. In that case it can be pointed out that the problem as stated above falls within the domain of the theory of the firm--in a broad interpretation--and this is sufficient reason for its investigation. In the theories of value and growth the firm is usually dealt with as a tool. That is, no effort is made to explain the phenomena

¹The firm is hardly ever discussed by growth theorists. An important exception is James S. Duesenberry, Business Cycles and Economic Growth (New York: McGraw-Hill Book Company, Inc., 1958), who pays a good deal of attention to the theory of the firm in the context of growth phenomena. See especially pp. 49-112.

taking place within the firm. Here, the firm itself is the object of study. As such the analysis is also considered relevant for insight into problems of macro-economic theory and for all types of policy affecting or designed to affect business profits and growth.

The problem, simply stated, is how the making of profit is related to the pursuit of other objectives in managerial decision making. There is empirical evidence that businessmen find this problem an important one. Few speakers defending a corporation's policy in front of its stockholders make it a secret that profit retention is necessary for and at least partly aimed at promoting the firm's growth in the future. A recent publication by the Bell System in the United States makes a strong case for the making of profit in order to promote the further development of industry.¹

In the following study, no empirical facts have been established about the interrelations between profit and growth. The results of the analysis are given in the form of highly tentative hypotheses. Some of these hypotheses indicate possible interrelations between profit and growth, most of them refer to related matters like managerial motivation, managerial decision making and the choice of maximands. Since there is much disagreement about several issues touched upon in subsequent chapters, reconciliations of different points of view on some crucial issues are suggested.

¹W. H. Larabee et.al., Profit, Performance and Progress: A Study of Regulated and Non-regulated Industry for Bell System Use (The Bell Telephone System: May, 1959).

Previous Contributions and Their Relation to the Present Study

Important work has been done on the problem of profit and the problem of growth, even on the micro-economic level. Some theories exist which are directly or indirectly connected with the inter-relations of these variables. Recent contributions on this point are discussed briefly below. This will also give an opportunity to clarify the scope of the argument as presented in the subsequent chapters.

Classical Development Theories: Marx and Schumpeter

In the previous section it was indicated that hardly any use can be made of the existing macro-economic theory. This is not surprising since its development stemmed basically from the purely macro-economic approach which was started by John Maynard Keynes.¹ There existed theories of economic development before Keynes initiated the modern type of growth analysis. Here one thinks especially of Karl Marx and Joseph Schumpeter. Both of these authors applied a micro-economic approach. It must be pointed out, however, that they were not primarily concerned with growth on either the macro- or the micro-level, but with the development (or evolution) of societies. Their contribution to the solution of the growth problem on the single firm level is therefore small. The theory of Marx is irrelevant in this context because it lacks any reference to the decision-making process within the firm. He does suggest, however, that the making

¹John Maynard Keynes, The General Theory of Employment Interest and Money (New York: Harcourt, Brace and Co., 1936).

of profit by a firm will lead to the making of more profit (and maybe additional growth) in the future.¹

Schumpeter does not discuss the growth of the individual firm explicitly. Like Marx he is not interested in the process of decision making. He discusses the behavior of an "innovating" firm on the basis of the profit motive, but, as should be obvious, innovation does not necessarily imply growth. Whenever there is growth in the Schumpeterian case this is incidental to the pursuit of profit.² Schumpeter suggests basically the same relationships on the micro-economic level as Marx does. The growth pattern, if any, depends entirely on the nature and timing of innovations, that is, the introduction of new combinations of means of production.³

Biological Growth Theories

There has been some tendency in the past to look for analogies between biological and economic development theories, but the feasibility of these efforts has been disputed by Penrose. In an article especially directed against the work in this area by Marshall, Boulding and Alchian, she in fact denies that such analogies have any theoretical meaning for economic analysis.⁴ Her principal conclusions are two in number: (1) biological growth theories lack the crucial

¹Karl Marx, Das Kapital: Kritik der politischen Oekonomie, ed. Karl Kautsky, Vol. I (8th ed. unrev.; Berlin: J.H.W. Dietz Nachf., G.m.b.H., 1928), passim.

²Joseph A. Schumpeter, The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, and the Business Cycle, trans. Redvers Opie, "Harvard Economic Studies," Vol. XLVI (Cambridge, Mass.: Harvard University Press, 1951), especially pp. 57-94.

³The term "innovation" is used in a very broad sense.

⁴Edith Penrose, "Biological Analogies in the Theory of the Firm," The American Economic Review, Vol. XLVII (December 1952), pp. 804-819. Cited hereafter as "Biological Analogies."

concept of human motivation, (2) the observation of analogies has no explanatory value. These conclusions must be considered correct. The discussion and subsequent repudiation by Penrose of the Marshallian "life-cycle" theory of the firm makes it unnecessary to discuss it in any detail here.¹ It will be shown that the continuity assumption, contrary to the life-cycle theory, has important and quite different theoretical implications. The continuity assumption implies only that management does not contemplate the liquidation of the firm at any future moment.

The homeostasis theory and the viability theory, applied respectively by Boulding and Alchian to the theory of the firm, are also based on biological analogies. In contrast to the life-cycle theory, however, they can be reconciled with the argument in the following chapters of this study, and for this reason they are briefly discussed.

The Homeostasis Theory

Boulding defined the concept of homeostasis as "a mechanism for stabilizing a variable or a group of variables within certain limits of toleration."² From this formulation one can also infer an analogy with engineering. In the theory of homeostasis an organization (like the business firm) consists mainly of a more or less elaborate apparatus to maintain various variables between an upper and lower

¹Marshall recognizes the possibility of survival for joint stock companies. See Alfred Marshall, Principles of Economics (8th ed.; London: MacMillan and Co., 1920), p. 316.

²K. E. Boulding, "Implications for General Economics of More Realistic Theories of the Firm," The American Economic Review (Papers and Proceedings), Vol. XLII (May, 1952), pp. 35-44, especially p. 36. Cited hereafter as "Implications."

limit.¹ A "first-approximation theory of the firm is a theory of 'homeostasis of the balance sheet,' treating the behavior of the firm as a reaction to changes in its balance-sheet structure, designed to restore the balance-sheet composition to its 'ideal' value."² Penrose adequately states that the homeostasis theory provides "a formal framework into which many routine responses can be fitted."³ But the concept as such can never explain how and why the homeostasis was established. Neither can it explain the conditions under which decisions may be made to alter the upper and lower limits of the variables.⁴

Of course, Boulding recognizes that the limits of toleration can change over time. He introduces the homeostasis of the firm as a short-run concept. The long-run development of the firm, he thinks, should be explained in terms of a life-cycle theory.⁵ This, however, involves a certain contradiction, since homeostasis implies an equilibrium. As long as the limits of toleration do not change and the mere passing of time does not affect the "stabilizing mechanism," this implies continuity or, at least, an indefinitely long-lasting existence of the firm. Indeed, the homeostasis concept can be reconciled with the assumption that the lifetime of the firm

¹Ibid.

²Ibid., p. 40.

³Penrose, "Biological Analogies," p. 818. This point is elaborated in ch. iv.

⁴Ibid. See also Kenneth E. Boulding, A Reconstruction of Economics (New York: John Wiley & Sons, Inc., 1950), pp. 33-34. Cited hereafter as Reconstruction. A possible explanation for a change in the structure is presented in ch. iv.

⁵Boulding, Reconstruction, p. 26; idem, "Implications", p. 39.

is indefinite.¹ In that case there is no place for a life-cycle theory.

It is possible that a general theory of organization can throw new light on economic dynamics as Boulding suggests.² The homeostasis theory, however, is more closely connected with the stationary state of an individual firm than with dynamic developments in the entire economy. The idea of homeostasis can be preserved only if all the variables concerned are allowed to change at the same rate (or at a rate which keeps the relevant ratios between the limits of toleration). Conditioned in this way, the concept can be integrated with the theory and concepts developed below.

Homeostasis is a useful notion provided that it is detached from mysterious "laws of nature" and "mechanisms" and defined in terms of rational managerial decision making in the face of uncertainty. Besides, it must be defined in terms of relative values rather than absolute values of the variables concerned if it is to be useful in growth analyses.³ It is necessary to explain why homeostasis exists and how it influences the decision-making process.⁴

¹The continuity assumption can be made quite apart from the question whether or not one believes in the existence of such a nebulous thing as a life cycle of the business firm. The relations between homeostasis and continuity will be discussed more fully in ch. iv.

²Boulding, "Implications," p. 44.

³Boulding allows for this interpretation of homeostasis in a later publication. See Kenneth E. Boulding, "The Present Position of the Theory of the Firm," Linear Programming and the Theory of the Firm, ed. Kenneth E. Boulding and W. Allen Spivey (New York; the MacMillan Co., 1950), pp. 1-18, especially p. 14. Cited hereafter as "The Present Position."

⁴Boulding, of course, is aware of this but seems to have made no steps in that direction as yet. Ibid., p. 13.

The Viability Theory

Alchian has applied the viability analysis to the theory of the firm.¹ The starting-point for this argument is the claim that it is impossible to maximize profits under conditions of uncertainty.² He admits that there is purposive behavior present in reality but the objectives motivating economic activity are said to be varying and conflicting.³ One particular objective is to make "realized positive profits" which are called "the sine qua non of survival and success."⁴

According to Alchian it is impossible for management to identify the most profitable course of future conduct. As a result one sees in practice an individual adaptation to the environment via imitation of other firms and trial and error methods. Imitation of successful enterprises accounts for some of the aspects of business behavior which have been observed by scholars making empirical studies. "What would otherwise appear to be merely customary 'orthodox', nonrational rules of behavior turns out to be codified imitations of observed success, . . ."⁵ Success is identified with realized positive profits. Trial and error methods are also supposed to be used in the search of success. Both imitation and venturesome innovation via trial and error methods

¹Armen A. Alchian, "Uncertainty, Evolution, and Economic Theory," The Journal of Political Economy, Vol. LVIII (June, 1950), pp. 211-221.

²Discussed below, ch. ii.

³Alchian, loc. cit., p. 217.

⁴Ibid.

⁵Ibid., p. 218. A different interpretation of Alchian's observations is given in ch. iv.

are types of conscious adaptive behavior. All behavior is apparently aimed at survival or, to use Alchian's term, the "adoption" by the economic system.¹

Two observations are in order. First, Alchian's analysis involves an inconsistency. Firms, he says, ~~pursue~~ profits or success.² He does not define profits but it is clear from the context that profits are interpreted in an ex-ante sense. The firm's decision makers envisage several courses of action which could be followed in the future. The future is uncertain, however, and they have insufficient foresight to know which course will result in maximum profits.³ Therefore, management resorts to the sort of imitation described above. It is difficult to understand from Alchian's argument why management should not choose that imitation (or innovation) which in its opinion would lead to the greatest success.

The choice of which firm to imitate must be based on some standard of measurement. Measurement must necessarily be in terms of ex-ante profit, because ex-ante profit is identified with future success. Thus the firm will choose the course of action which promises the highest "realized positive profits" at some future date. Yet, for Alchian this does not mean that management maximizes profits; it is simply adapting its behavior. The conclusion must

¹Ibid., p. 211.

²Ibid., p. 218.

³The same position is taken by Stephen Enke, "On Maximizing Profits: A Distinction between Champerlin and Robinson," The American Economic Review, Vol. XLI (September, 1951), pp. 566-578.

be that Alchian has misapplied the concept of ex-ante profit in his analysis of business behavior.¹ This concept is discussed fully in chapter ii.

Second, Alchian's analysis suggests a distinction between a basic objective (the survival of the firm) and a principal objective (the maximization of profit). His conception of the survival of the firm constitutes an important contribution and the suggested distinction is a crucial one. This aspect of Alchian's analysis will be reconciled with the implications of the continuity assumption in a later chapter. The continuity assumption provides a plausible explanation for the imitative types of behavior observed by Alchian, but this requires a more extensive discussion of motivation than he has given.²

The Sales-maximization Hypothesis: Baumol's Contributions

Baumol has been the first economist to present the sales-maximization hypothesis in explicit terms.³ Stated in simple terms

¹There is some evidence that Alchian is concerned with the possibility of maximizing profits in a sort of objectively predictable sense. Then his conclusions must be considered correct. This problem is not related to the one dealt with in this study, namely, the process of decision making on the individual level. The position taken here is that management can try to maximize profit. Whether it will actually succeed in doing so is beside the point. The distinction made here is also found in Enke, loc.cit., p. 576, who acknowledges that decision making directed toward maximization of profit is probable. See below, ch. ii. See also Fritz Machlup, The Economics of Sellers' Competition: Model Analysis of Sellers' Conduct (Baltimore: The Johns Hopkins Press, 1952), pp. 53-56.

²For Penrose's criticism of Alchian's remarks on motivation see "Biological Analogies," pp. 815-816.

³William J. Baumol, Business Behavior, Value and Growth (New York: The Macmillan Company, 1959), pp. 45-53. Cited hereafter as Business Behavior. See also William J. Baumol, "On the Theory of Oligopoly," Economica, New Series, Vol. XXV (August, 1958), pp. 187-198.

it says that decision making is aimed at the maximization of the firm's sales volume in money terms. Sales maximization takes place in the short run as well as in the long run.¹ The hypothesis is mainly based on plausibility arguments and on observations of actual business behavior. Baumol applies his hypotheses to two quite different fields in economics, namely, the theory of imperfect competition and the theory of macro-economic growth. Neither of these applications pertains to the present study.

According to Baumol, sales maximization takes place only after a minimum profit level has been achieved. From this he derives that "the typical oligopolist's objectives can usefully be characterized, approximately as sales maximization subject to a minimum profit constraint."² Subsequently, he discusses the determination of this minimum profit level, but his discussion can not be considered quite adequate. More explicitly, Baumol appears to discuss an optimal level of profits instead of a minimum level. The same ambiguity is found in an article by Peston.³

At the same time, Baumol points to an interesting matter in the theory of managerial decision making, namely, the concern on the part of management for the funds potentially available in the future. This issue is taken up in chapter iii where an attempt

¹Baumol, Business Behavior, p. 52.

²Baumol, Business Behavior, p. 49; idem, "On the Theory of Oligopoly," pp. 187-188.

³M. H. Peston, "On the Sales Maximization Hypothesis," Economica, New Series, Vol. XXVI (May, 1959), pp. 128-136.

is made to derive a business objective very akin to the usual profit-maximization assumption, namely, the maximization of long-run profit. Baumol's analysis of the managerial maximization process can be reconciled with the available-funds hypothesis which is also developed in chapter iii.

Baumol does pay some attention to interrelationships between profit and size. The size of the firm is defined as "the amount of owned and borrowed capital invested in either liquid or illiquid form."¹ The interrelations between profit and size and their impact on growth are indicated as follows.²

We see then that the businessman's desire to increase his profit lends itself to translation into a desire to expand his firm. For large size may raise the firm's profits more than in proportion to the value of its assets. This, in turn, means that large size can increase the magnitude of the funds which he can accumulate to finance further expansion. The businessman must have amassed wealth to be an efficient wealth amasser. These relationships alone can motivate businessmen to work hard to expand the scale of their operations.

Generally speaking, these conclusions are in agreement with those reached below and are closely related to those indicated by Penrose.³

In short, Baumol's conclusions may be correct, even though they do not seem to follow from his analysis in the way he suggests. His analysis lacks the discussion of some points which will be shown to be important.⁴ Besides, the distinction between theoretically

¹Baumol, Business Behavior, p. 34.

²Ibid., pp. 43-44. Note that this quotation points toward profit maximization rather than sales maximization. See also below, ch. iii.

³Discussed in the following section.

⁴Especially the relationships between motivation, decision making and actually observable behavior deserve more attention than Baumol has paid to them.

derived conclusions and empirical observations is not always sharply drawn. Nevertheless, as will be seen, Baumol's general discussion provides many of the ingredients for a realistic theory of managerial behavior.

The Growth Theory of Penrose

None of the authors discussed so far has been primarily concerned with the theory of ~~growth~~ of the individual firm. Penrose has been the first economist to explore the phenomenon thoroughly.¹ As was indicated in the first section of this chapter, she also discussed some of the problems involved in the relationships between individual profit and individual growth. Like Baumol, Penrose has indicated some relationships which seem to be plausible, even though exception must be taken to the way she derived the conclusions.

Interrelations between Profit and Growth

Penrose discusses the interrelations between profit and growth in connection with the motivation of the firm.² She assumes that "investment decisions are guided by opportunities to make money; in other words, that firms are in search of profits."³ A major objection to the whole discussion is that profits remain undefined. Yet, ex-ante profit as well as ex-post profit appear implicitly throughout her study.

¹An earlier version of her theory was published in 1955. See Edith Penrose, "Limits to the Growth and Size of the Firm," The American Economic Review (Papers and Proceedings), Vol. XLV (May, 1955), pp. 531-543.

²Penrose, Theory of Growth, pp. 26-30.

³Ibid., p. 27.

An important question that Penrose tries to answer is, "Why should a firm, or more accurately the managers of a firm, always want to make more profits?"¹ She discards the remuneration of stockholders as a plausible explanation. As will be seen in a later chapter the maximization of the returns to stockholders has indeed been defended as the goal of business. On the other hand, Penrose also denies that for the sake of profit retention, dividend payments are always kept at a minimum, "no higher than necessary to keep investors happy..."²

It follows that Penrose has a sort of optimum dividend policy in mind. The connection between this optimum dividend policy and the profit-maximization assumption is not investigated. Yet it will be seen that her remarks on this point refer very distinctly to the existence of a maximand which differs from profit in the traditional interpretation. Penrose's analysis, like Baumol's, can be reconciled with the available-funds hypothesis.

Although maintaining the profit-maximization assumption, Penrose emphasizes the importance for management of the successful growth of the firm. This leads her into a somewhat peculiar argument. Profits are apparently not maximized in the sense that they are ultimately supposed to be used for the consumption of some group associated with the firm. This is the fundamental digression from the traditional interpretation on this point. Instead, the position of Penrose seems at times to be that the ultimate goal of management is the maximization of growth rather than profit.

¹Ibid., italics in original.

²Penrose, Theory of Growth, p. 28.

That this is not actually the case, however, is obvious from the following quotation. "In other words, profits would be desired for the sake of the firm itself and in order to make more profit through expansion."¹ That is, profit is an end in itself and a means to making more profit. Although she considers it "the most plausible of the various possible assumptions," Penrose admits that this proposition may seem to imply extreme and almost irrational behavior.² Indeed it does because she does not make clear what management really wants when it thinks of profit maximization and even more important why it wants this. As will be seen in chapter v it is possible that management identifies growth and profit in the long run. Penrose, however, does not explicitly mention this possibility.

The question remains as to what Penrose considers the ultimate goal of the firm to be. Do the maximization of growth and the maximization of profit indeed lead management at any moment to the same choice from any set of alternative future courses of action? Penrose answers this question as follows.³

If profits are a condition of successful growth, but profits are sought primarily for the sake of the firm, that is, to reinvest in the firm rather than to reimburse owners,... then, from the point of view of investment policy, growth and profits become equivalent as the criteria for the selection of investment programmes.

¹Ibid., p. 29. See also the reference to Maurer, ibid., n. 3.

²Ibid., p. 29.

³Ibid., p. 30, italics in original.

It follows, according to Penrose, that to increase total long-run profits is equivalent to increasing the long-run rate of growth. "Hence it does not matter whether we speak of 'growth' or 'profit' as the goal of a firm's investment activities."¹ These propositions seem plausible and they are consistent with those of Baumol. Yet, they are not very rigorously derived. This becomes especially clear if it is realized that Penrose measures growth in terms of fixed assets, which makes it identical to net investment in fixed assets.

Most of the problems indicated here will be dealt with in later chapters. When appropriate, a comparison is made between the results of the present study and Penrose's propositions. At this point it can only be suggested that she has clearly indicated the problem, but not solved it. This, it seems, is primarily a result of the use of too few and too vaguely defined concepts of profit and of growth. In fact, Penrose pays relatively little attention to the problems of motivation and maximization. Her analysis of the growth of the firm is entirely based on the theory of the receding managerial limit, which is discussed next.

The Theory of the Receding Managerial Limit

Penrose assumes that numerous profitable opportunities are open to the individual firm. However, firms will not try to make use of all the opportunities "if the officials of the firm are themselves concerned to maintain its character as an organized unit."² If a firm grows more rapidly than the managers can obtain the necessary

¹Ibid.

²Ibid., p. 45.

experience with one another and with the firm, this may lead to stagnation.¹ It follows that Penrose views the survival of the firm as a restriction on the managerial maximization process. This point is elaborated in chapter iv.

Managers with experience within a particular firm can not be hired from outside. This makes the availability of managerial services significantly different from the availability of other productive resources. This is the core of the theory of the receding managerial limit. The capacities of the existing experienced managerial group set a limit to the rate of growth of the firm. An important property of this limit is that it recedes over time because more knowledge is continuously gathered as a result of experience in operating the firm.² The nature of the limit and its recession over time are fully explored by Penrose. Thus a theory of the process of growth is developed.

Inducements and obstacles to expansion can be both external and internal. The crucial internal inducement is the "continuing availability of unused resources" within the firm.³ The availability of managerial services is especially emphasized. Thus Penrose constructs a theory which explains the growth of individual firms almost entirely in terms of internal inducements and obstacles. While she is clearly aware of several types of both phenomena,⁴ her treatment of the growth problem shows a strong

¹Ibid., p. 47.

²Ibid., p. 54.

³Ibid., p. 67.

⁴Ibid., pp. 65-66.

preoccupation with the availability of managerial capacities. This factor is considered the crucial constraint and at the same time the most important inducement to growth. Although both aspects will be largely ignored in the following chapters, it can be shown that they can be important elements in a more general theory of the growth of the firm than the one Penrose has constructed.

Summary and Outline of the Following Chapters

All of the theories discussed so far are related to the problems to be dealt with in the following chapters of this study. The basic problem is: what are the interrelations between decisions to maximize profit and decisions to pursue other objectives. Only Baumol and Penrose have, to some extent, been explicit about this issue. Both authors seem to be aware of the possibility of constructing a theory of profit maximization which incorporates within it the modifying effects of other objectives.

The theory of profit maximization is discussed in chapter ii of this study. An effort is made to clarify some of the current controversies on this problem. In chapter iii an attempt is made to show how the theory of profit maximization in its present state must be modified under the continuity assumption. Stated in simple terms the continuity assumption says that management will generally not consider the liquidation of a firm at any future moment. The consequences of this assumption for the profit-maximization theory are investigated in chapters iii and iv.

In chapter iii an effort is made to advance a more general theory of maximizing behavior than the one set forth in chapter ii. If this theory is correct it follows that the maximization of any

variable (or system of variables) by management under the continuity assumption must be viewed as subordinate to the maximization of what is called long-run profits. The analyses of both Baumol and Penrose lend support to the ideas advanced in chapter iii. The contributions of, for instance, Albert Hart and Gerhard Tintner to the theory of flexibility in planning can also be reconciled with the maximization of long-run profits in the interpretation of chapter iii. The conclusions of chapter iii are derived mainly from the reconciliation of the present theory of profit maximization with the continuity assumption. It is presented as at least a partial clarification of the present confusion about the choice of the maximand in the theory of the firm.

Ex-post profit is a difficult concept. In chapter iv a critical review is given of some of the interpretations advanced by various authors. At the same time the possible significance of these concepts for managerial decision making is discussed. An effort is made to reconcile the different approaches to ex-post profit by introducing the concept of the minimum goal of the firm.

The maximization of any variable by management is usually , considered subject to more or less rigid restrictions. In chapter iv an effort is made to discuss these constraints in more detail and from a somewhat different point of view than is commonly done. This discussion is again based on the continuity assumption which in this context provides criteria for the survival of the firm. The conclusions are consistent with Boulding's theory of the homeostasis of the firm. Some aspects of the theory of Penrose are also relevant in this context.

In chapter v attention is given to the relationships which may exist between the pursuit of profit and that of growth. The topics dealt with in this concluding chapter are extensions of the ideas set forth earlier. Special consideration is given to the possibility of conflicting objectives in the long and short run in modern corporations.

Many difficulties would be involved in testing the results empirically. One of these difficulties would be that the conclusions are stated in very general terms. For instance, no definite choice is made as to the "proper" interpretation of growth and the "proper" interpretation of ex-post profit. Although no such attempt will be made, some observations are made on the possibility of testing the results. No effort has been made to intervene in what is considered the manager's business. The purpose of the study is to provide a general framework for a better understanding of business behavior, rather than to suggest what business behavior should be.

CHAPTER II

THE THEORY OF PROFIT MAXIMIZATION

This chapter deals with the theory of profit maximization. Before discussing profit maximization proper, some introductory remarks are made on the nature of the firm and its management. The theory of profit has in its present form been subject to criticism of two sorts. They refer to the possibility of profit maximization and to the adequacy of the profit-maximization assumption. Only the first of these criticisms is dealt with in the present chapter.¹

The concept of subjective ex-ante profit is introduced after some basic notions relevant to this concept have been defined. The section on ex-ante profit is followed by a short review of some related ex-post concepts. The chapter is summarized by a description of the way in which an economist can visualize the decision-making process under profit maximization. Finally, the concept of ex-ante profit as set forth in the present chapter is compared and reconciled with the profit concept employed in the traditional theory of the firm.

¹The discussion of the adequacy of the profit-maximization assumption is deferred to ch. iii.

It merits some emphasis that in the present study no attention has been paid to the theory of profit as it is dealt with in analyses of income distribution. Of course, there is a close connection between this sort of analysis and the one presented here.¹ However, a discussion of all aspects of the profit concept falls necessarily beyond the scope of the present study which, again, is only concerned with the nature of managerial maximizing behavior in the individual firm and the relations between profit and growth which this behavior may imply.

The Frame of Reference:

Some Basic Notions and Assumptions

It is appropriate to discuss at the outset some of the concepts which will be employed throughout. These concepts are familiar but their interpretation has not always been uniform. Apart from the need for definitions that are rigorous enough to be applied meaningfully, some assumptions must be made in developing any theory. In this study many of the assumptions concern the behavior of people (or groups of people) or, more specifically, the behavior of persons who are involved in the decision making of the firm. Some of these assumptions will involve considerable **abstraction**, but this is essential to a study of this sort.

¹This is especially so since the modern theory of income distribution also employs ex-ante concepts. For a survey of the analysis of profit in the modern theory of income distribution see Richard M. Davis, "The Current State of Profit Theory," The American Economic Review, Vol. XLII (June, 1952), pp. 245-264. More extensive is Bernard Biet, Théories contemporaines du profit: Essai de micro et macro-analyses (Paris: Librairie de Médicis, 1956).

The Scene of Action: The Firm

A choice must be made between two theoretical interpretations of the firm: the ownership concept and the entity concept. The first of these concepts is applied in the traditional theory of the firm. In this theory the firm is closely associated with its owner, who is called the producer, the business man, the undertaker or the entrepreneur. The firm is viewed essentially as an investment by means of which the owner tries to maximize his income. This approach, however, appears to be inappropriate for the analysis of the growth of the firm.¹ The main objection is that in the analysis of the behavior of this kind of firm the number of variables commonly used is insufficient to explain the micro-growth phenomena taking place in real life.

In the second interpretation the firm is conceived of as an entity in itself, apart from its owners. Theoretically, any firm may be treated as an economic subject, since, from a strictly economic point of view, there is no sharp difference between the one-man business firm and the corporation.² The entity concept of the firm is employed throughout this study without

¹This has been demonstrated quite convincingly by Penrose, Theory of Growth, pp. 11-24. See also Boulding, Reconstruction, pp. 33-35.

²Of course, this procedure is not always the most appropriate. See below, ch. iii.

defining it very rigorously.¹ It is assumed that the firm itself is the locus where the decisions relevant to the study are made. That is, none of the decisions made is subject to the approval of managements of other firms. Although the analysis deals with the firm in general it appears to be convenient to think of it as a corporation of the kind which is common in Western Europe and the United States. The concept of the firm adopted here corresponds very closely to the entity concept as employed by Penrose. The distinction between the ownership theory and the entity theory will be seen to play a role in the controversies on the nature of the managerial maximand and on the nature and determination of ex-post profit.

Management and Decision Making: Some Preliminary Observations

Although the assumption that the firm itself is an economic entity is plausible enough to justify its use, it is obvious that a firm's actions not only depend on human intervention but are impossible without it. Business behavior is a consequence of decision making and decisions are necessarily made by people. This means that in explaining business behavior one must analyze

¹The entity concept is widely applied in industrial economics in especially Germany and The Netherlands. See, for instance, J. L. Meij Jr., Leerboek der bedrijfseconomie, Vol 1 (8th ed.; 's-Gravenhage: N. V. Uitgeversmaatschappij v/h G. Delwel, 1954). Cited hereafter as Leerboek. From the same author, "Bedrijfshuishoudkunde als onderdeel der economische wetenschap," Tijdschrift voor Sociale Wetenschappen (No. 3, 1957), pp. 159-176. See also James H. Stauss, "The entrepreneur: The Firm", The Journal of Political Economy, Vol. LII (June, 1944), pp. 112-127, and Penrose, loc. cit.

which decisions, leading to a specific behavioral pattern in the firm's actions, are made and, more basically, why they are made. Decisions are invariably based on value judgments and value judgments, in turn, are necessarily based on some objective or set of objectives. In principle, therefore, any firm's behavior can be explained in terms of the personal objectives pursued by those who make the decisions which lead to its actions. Any personal objective can be stated in terms of utility maximization. The behavior of the firm is affected by utility maximization on the part of its managers.

In the light of this conclusion it seems quite appropriate to analyze the behavior of the one-man business firm in terms of the preference function of its owner. This method has indeed been applied in the past.¹ The only basic difference between this analysis of the firm and the theory of consumer behavior is that the subject's income in the first case is unknown, rather than being given. The utility analysis is less appropriate in interpreting the actions of the modern corporation because too little is known about the interactions of the utility systems of different persons associated with such a firm. The traditional means of dealing with this problem is to ignore the differences between the one-man firm and the corporation, and to assume that management in each case tries to maximize profit, rather than utility. This implies that the utility derived by management from running a business firm is supposed to be a monotonically increasing

¹See for instance, Leonid Hurwicz, "Theory of the Firm and of Investment," Econometrica, Vol XLV (April, 1946), pp. 109-136.

function of the profits, (that is, the entrepreneur's or the stockholders' income) made, or expected to be made.

This implication makes the appropriateness of the assumption with regard to modern corporations highly questionable. Rather than making any speculations about the possible ways in which the behavior of the firm may be affected by individual utility maximization of a heterogeneous group of managers, it is assumed in this study that only one manager acts on the highest echelon of the organization. Unless otherwise indicated, therefore, the term management refers to what is commonly called top-management. This assumption makes it possible to avoid the difficulties involved in group decision making. It is assumed that the reward resulting from being a manager--either in pecuniary or non-pecuniary form-- is a monotonically increasing function of at least one of the firm's decision variables, such as the firm's profit, its sales or its size.¹ This function is called the maximand of the firm. The psychic income which top-management derives from its association with the firm is supposed to be independent of all other factors.

Decision making can be viewed as the activity of assigning values to the firm's decision variables. Decision variables are those variables the magnitudes of which, in the opinion of management, (1) can be manipulated (or can be made subject to manipulation) and (2) are considered fundamental to the achievement of the firm's objectives. They might include, for example, the

¹Decision variables are defined below.

firm's total investments per period or over a number of periods, its dividend payments and the permissible ratio between debts and total assets.

The Possibility of Profit Maximization:

The Use of Certainty Equivalents

Much of the discussion on business behavior centers around the question of whether or not management actually tries to maximize profits and, if not, which variable (or system of variables) represents the maximand in real life.¹ Traditionally it is assumed that the firm (or its management) tries to maximize profit. This assumption and the theory to which it leads have recently been challenged by two groups of theorists: (1) those who deny the possibility of profit maximization under uncertainty, (2) those who deny the appropriateness of the profit-maximization assumption. The first criticism is discussed in the present section.²

Alchian has constructed a theory of the firm which differs considerably from the usual one, because he maintains that it is impossible for management to maximize profits.³ He bases his

¹A more fundamental question is whether management actually tries to maximize any variable (or system of variables). This last question is not considered here, the assumption being made that management tries to do "the best it can." If the plausibility of this assumption is not challenged--and there is little reason to do so--it follows that there exist maximands which govern managerial behavior. That is, decision making is directed towards the pursuit of optimal behavior.

²The second criticism is dealt with in ch. iii.

³It has been shown in ch. i that this has lead Alchian into an inconsistency. It was noted that Enke does not make this mistake. See Enke, loc. cit., p. 576.

rejection of the profit-maximization assumption on some articles of Tintner¹ who, in turn, refers to the work of Carl Menger and J. Marschak.² Uncertainty is supposed to imply not single-valued expectations but a probability distribution of the potential outcomes of the various possible courses of actions. The argument boils down to the proposition that it is impossible to maximize entire probability distributions of potential outcomes of alternative actions. It is only possible to select an alternative on the basis of a preference function. This preference function may depend on several parameters of the probability distribution, specifically, not only the mean value of the distribution may be considered but higher moments as well.³

Suppose that a firm's decision makers indeed think in terms of probability distributions of potential outcomes in money terms and that in selecting one of the alternatives a preference function of the above mentioned type is utilized. To assume the maximization

¹Alchian, loc. cit., p. 212.

²Gerhard Tintner, "A Contribution to the Nonstatic Theory of Production," Studies in Mathematical Economics and Econometrics, ed. Oscar Lange, Francis McIntyre and Theodore O. Yntema (Chicago: The University of Chicago Press, 1942), pp. 92-109, especially p. 100; idem, "The Theory of Choice under Subjective Risk and Uncertainty," Econometrica, Vol. IX (July-October, 1941), pp. 298-304, especially p. 301.

³For a somewhat more extensive summary of Tintner's findings see Andreas G. Papandreou, "Some Basic Problems in the Theory of the Firm," A Survey of Contemporary Economics, ed. Bernard F. Haley, Vol. II (Homewood, ILL.: Richard D. Irwin, Inc., 1952), pp. 183-221, especially pp. 208-209. A very clear exposition of the issue by Marschak is found in J. Marschak and W. Lederer, Kapitalbildung (London: William Hodge and Company Limited, 1936), pp. 4-7.

of the mean value of the probability distribution is an oversimplification. So much is clear from the arguments of Marschak, Tintner and Alchian.¹ Still it remains to be seen why the maximization of a preference function of the type mentioned above should not be called profit maximization. One good reason can be indicated. By introducing at least one of the higher moments of the probability distribution into the preference function it is impossible to exclude from the analysis what is usually referred to as the "attitude towards risk" of the decision maker concerned. That is, decision making now involves elements of utility functions.²

It seems that economists have overcome the problems involved in preference functions by the introduction of so-called "certainty equivalents." A certainty equivalent is defined as the outcome of an uncertain event which, if certain to be realized, would satisfy management just as well as the outcome anticipated with uncertainty.³ Management is supposed to translate the uncertain outcome of any alternative course of action into certainty equivalents. This translation takes place via a preference function of the type Tintner has developed. Throughout the following chapters the method of certainty equivalents is employed. Thus it

¹Yet this does not seem to be a general rule. Cf. Herbert A. Simon, "Theories of Decision-Making in Economics and Behavioral Science," The American Economic Review, Vol. XLIX (June, 1959), pp. 253-283, especially p. 268 and the references there given.

²See, for instance, Tintner, "A Contribution to the Nonstatic Theory of Production," pp. 106-109, and Marschak and Lederer, loc. cit.

³Cf. Edgar O. Edwards and Philip W. Bell, The Theory and Measurement of Business Income (Berkeley: University of California Press, 1961), pp. 65-66.

is possible to avoid many of the complicated problems which arise in connection with uncertainty.

The function by which the probability distributions are transformed into certainty equivalents reflects at least some of the properties of the probability distributions. Certainty equivalents, therefore, reflect the "aversion to risk" or the "preference for risk" of the decision maker.¹ One might argue, therefore, that the maximization of a function such as subjective goodwill--which is stated in terms of certainty equivalents of expected net receipts--does not represent profit maximization proper.² Strictly speaking this objection is correct since elements of management's utility function are usually reflected in any decision. Once the proper qualifications are recognized, however, it is felt that one can maintain the traditional terminology and still derive consistent meaningful conclusions.³

Finally, the effects on profit expectations of possible precautionary measures like planning for flexibility or

¹The same holds for the sort of preferences indicated by Boulding in his discussion on game theory. See Boulding, "The Present Position," p. 11.

²On this point see also Melvin L. Greenhut, "A General Theory of Maximum Profits," The Southern Economic Journal, Vol. XXVIII (January, 1962), pp. 278-285.

³Cf. Machlup, op.cit., pp. 51-56. Greenhut tries to develop statistical criteria to distinguish between profit maximization and "non-maximum profit seeking behavior." See Greenhut, loc. cit., especially pp. 281-282 and p. 283n. Examples of the last type of behavior are gambling and striving for extreme security. The statistical criteria of what is profit maximization and what is not are, of course, arbitrary.

adaptability¹ are supposed to be implicit in the certainty equivalents. The same holds for the expected profitability of purchasing information² and similar complications involved in the formulation of the subjective goodwill of alternative courses of action. The problem of how certainty equivalents are formulated will hereafter be ignored in this study; it is simply assumed that they exist.

Subjective Ex-ante Profit:

Its Nature and Definition

This section deals with the interpretation of ex-ante profit and the crucial concepts applied in its definition. It is assumed that management tries to maximize profit.³ Possible constraints to which the maximization process may be subject are not taken into account. The discussion of ex-post profit concepts is deferred to a much later stage, except for what is usually called subjective ex-post profit.

¹See Tintner, "A Contribution to the Nonstatic Theory of Production," pp. 104-106 and Albert Gailord Hart, "Risk, Uncertainty and the Unprofitability of Compounding Probabilities," Studies in Mathematical Economics and Econometrics, ed. Oscar Lange, Francis McIntyre and Theodore O. Yntema, op. cit., pp. 110-118.

²See for a formal treatment of this problem Franco Modigliani and Kalman J. Cohen, The Role of Anticipations and Plans in Economic Behavior and Their Use in Economic Analysis and Forecasting, "Studies in Business Planning Number 4," University of Chicago Bulletin, Vol. LVIII (Urbana: The University of Illinois, January, 1961), pp. 55-77.

³The assumption of profit maximization is discussed in ch. iii.

General Remarks

The main objection economists have expressed to the ex-post profit concepts developed in theory and practice is that they can not provide management with means of choosing among alternative courses of future conduct under the assumption of profit maximization. The objection is based on the principle that decision making must necessarily be oriented towards future events.¹ This criticism gave rise to another profit concept, introduced into economic theory especially by Marschak,² E. Lindahl³ and J. R. Hicks,⁴ In their interpretation of profit the notion of subjective value takes a central place. Stated in broad terms the firm's subjective value represents how well off it thinks itself to be; it is a welfare concept.

Management can look upon the firm's welfare in retrospect and in prospect. In the first case, management determines what has been achieved in the past, in the second case, it considers what can be attained in the future. If the goal of the firm is not the maximization of profit, the variable which represents the firm's welfare need not even have a money dimension. In the literature, however, the concept of subjective value is used only in conjunction with profit maximization. This usage is followed

¹See Edwards and Bell, op. cit., pp. 1-28.

²Marschak and Lederer, op. cit., pp. 1-28.

³E. Lindahl, Studies in the Theory of Money and Capital, (New York: Rinehart & Company, Inc., 1939), pp. 74-111. Cited hereafter as Money and Capital. Idem, "The Concept of Income," Economic Essays in Honour of Gustav Cassel (London: George Allen & Unwin Ltd., 1933), pp. 399-407.

⁴J. R. Hicks, Value and Capital: An Inquiry into Some Fundamental Principles of Economic Theory (2nd ed.; Oxford: At The Clarendon Press, 1946), pp. 161-188. Cited hereafter as Value and Capital.

here. In this section then the main concern is the nature of the firm's prospective welfare determination when its management is supposed to maximize profit.¹

Only the owners or the management of the firm can be considered eligible to determine how well off the firm is. Diverging opinions between the two groups on this issue can lead to conflicts. Until chapter iv it is assumed, however, that none of the firm's shareholders can affect the decision-making process without the help of so many other "owners" that each of them considers the annual meeting of the firm's shareholders the only sensible opportunity to raise his voice on all matters related to profit determination, profit destination, and the choice of future conduct. In addition, it is assumed that the annual meeting of the firm's shareholders has no influence whatsoever on the decision making in the firm because its shareholders do not take advantage of this opportunity.² The firm is purely "management controlled."

Some Crucial Concepts in the Theory of Profit Maximization

Before dealing with ex-ante profit proper it is necessary to review briefly some related concepts, namely, subjective value, the discount rate and the expectational horizon. The definition of ex-ante profit can be developed in a quite straightforward manner once the conceptual difficulties have been overcome. It must be emphasized that there is no intention to show or describe

¹Retrospective welfare determination in terms of profit is the same as subjective ex-post profit determination. This problem will be taken up in the next section and is further discussed in ch. iv.

²This implies that the shareholders can only influence the firm's decision making indirectly, namely, via the price mechanism of the stock market. See ch. iii.

what managers do in practice. The following is only a way of visualizing what might happen if management actually tried to maximize profit. Objections pertaining to the fact that managers do not maximize profits because they do not know what subjective value, discount rates, and so on imply, are beside the point. In addition it must be stated that constructing the concept of ex-ante profit does not imply a prescription of rules which management must observe in order to behave "rationally."

Subjective Value

Assuming that management expects all receipts and expenditures of a period to take place simultaneously at the end of that period, the subjective value of a certain plan of operation is defined as the total value of the net receipts which management, in carrying out this plan, expects to obtain in each of a certain number of future periods, each net receipt being discounted (at a certain interest rate) to the moment of decision making.¹ Management can not be supposed to entertain single-valued expectations about each item in the expected stream of net receipts. Following Edwards and Bell² it will be assumed, therefore, that each item in this stream

¹The technique of determining subjective values, given the data, will not be discussed here. For a description of this technique see Edwards and Bell, op. cit., pp. 60-66; a more extensive discussion is found in Erich Schneider, Pricing and Equilibrium: An Introduction to Static and Dynamic Analysis, trans., T. W. Hutchinson (New York: The Macmillan Company, 1952), pp. 158-180. It should be observed, however, that the theoretical analysis of Schneider differs considerably from the one presented here. Schneider speaks of capital value, rather than subjective value; other terms sometimes used are present value and goodwill.

²Edwards and Bell, op. cit., pp. 65-66.

represents an amount which, if certain to be received on the specified date, would satisfy management just as well as the amount anticipated with uncertainty.

Expenditures should not be confused with "cost." A period must be interpreted as a planning period.¹ For reasons of convenience all planning periods are supposed to coincide with fiscal periods. Each alternative open to management constitutes a unique net-receipts pattern. The net receipts in different periods may be considered interdependent, the only consequence being an increase in the number of available alternatives. So far, the details of the discussion are in agreement with common usage in the literature.² Less agreement exists about the specification of the "certain interest rate" and the "certain number of periods" applied in the discounting process.

The Discount Rate

The use of the discount rate in evaluating expected net receipts is based on the assumption that, other things being equal, a sum of money to be received in some future period is valued higher than the sum of money to be received in any later period. The correctness of this assumption is usually taken for granted when it is applied to the theory of the firm, yet it is based entirely on properties ascribed to a utility-maximizing consumer.

¹See Lindahl, Money and Capital, pp. 40-51.

²There is an exception. For reasons which are theoretically hard to defend Lindahl makes a distinction between the subjective value of the firm (wealth) and the subjective value of its real capital. Money and Capital, pp. 101-108. This point is ignored in further references to this author.

In this study, however, management is assumed to maximize utility via the maximization of a definite variable. Under the present assumption this variable is profit. The time preference of management should, therefore, be viewed in the light of profit maximization. Because of the interest phenomenon, money has a sort of intrinsic expansive power. The reason why management, other things being equal, prefers receiving a sum of money now, rather than at any later moment, is that any sum can generally be increased over time. The standard of comparison is money, not utility.¹

Given the interest phenomenon, management will prefer to receive the same sum at the earliest possible moment because it is always possible to increase the amount over time. But how does it choose between different sums at different moments? The choice depends on the maximum amount of money management expects it can make on the earliest sum received during the time which elapses between receiving this sum and the later one. If during that space of time the first sum can in any way be made to grow larger than the absolute amount to be received at its end, the earliest sum will be preferred.²

¹The individual entrepreneur who runs and owns a one-man business firm, if studied as a utility maximizer, is a logical exception. See, for instance, Hicks, Value and Capital, pp. 194-196. For Hicks the entrepreneur is a consumer without a given budget restraint. Another author who bases the discounting factor on elements of psychic income is Hans Neisser, "Capital Gains and the Valuation of Capital and Income," Econometrica, Vol. IX (July-October, 1941), pp. 198-220, especially pp. 202-205.

²This, of course, is an accumulation process rather than a discounting process. Accumulation processes yield future values instead of present values. Cf. Edwards and Bell, op. cit., p. 61. An author who has applied an accumulation process is Marshall, op. cit., p. 354.

Does the same argument apply to the comparison between patterns of future net receipts? It can be argued that this is not the case. Two observations should clarify the issue. First, the net receipts are stated as certainty equivalents. Therefore, the discount rate can not be explained in terms of the uncertainty facing management. This factor has already been taken into account. If net receipts are supposed to represent, say, the mathematical expectations rather than the certainty equivalents of estimated outcomes, it may be appropriate to build the uncertainty factor into the discount rate.¹ The first approach, however, is more straightforward in connection with Tintner's contributions as mentioned in the previous section.²

Second, the discount rate is related to what management can make on a sum of money. It is not determined by what management must pay on borrowed money. Borrowing money is part of a plan, interest payments and refunds of the debt, therefore, should be included in the expected expenditures associated with that plan. The problem is thus: the return on what ~~use~~ management can make of a sum of money determines the discount rate?

The answer to this question which gives unambiguous results is that the discount rate to be applied for any future period is the interest rate management expects with subjective certainty to be able to make during that period on investments outside the firm.

¹This alternative is also indicated by ~~Marschak~~ and Lederer, op. cit., p. 6.

²Uncertainty and distance in time should not be identified. See Norman S. Buchanan, The Economics of Corporate Enterprise (New York: Henry Holt and Company, 1940), pp. 185-186. Cited hereafter as Corporate Enterprise.

It is not appropriate to allow for use of the money within the firm. Such a procedure leads to ambiguities because it already involves an evaluation of different uses of money. That is, it premises a standard of comparison between alternatives. This would involve a circular argument since the ultimate choice must by definition be based on profit comparison.

It follows that investment opportunities outside the firm must determine the discount rate. These investments should not include the buying of stock because this is one of the firm's alternatives and may involve (or be a part of) a profit-maximization plan. The discount rate to be applied to any future net receipt is determined by the maximum average interest rate management expects it can make on a sum of money during a space of time between now and the day of realization, in such a way, that the principle sum and the payment of interest is secured with subjective certainty. For reasons of convenience it is assumed that this interest rate is the same for all expected net receipts.

In fact the issue of the discount rate is a minor one for the problems dealt with in the present study. No effort has been made to review the many interpretations found in the literature on this matter. Opinions, however, diverge widely.¹ The previous discussion can, therefore, not be considered conclusive. Yet it is submitted as an

¹For a quite different interpretation of the discount rate in many respects see, for instance, Schneider, op. cit., pp. 158-180. His "target" rate of interest (p. 161) is determined by the cost of borrowing money as well as by management's attitude towards risk. For some further thoughts about subjective versus objective discount rates see Albert Gailord Hart, Anticipations, Uncertainty and Dynamic Planning, "Studies in Business Administration," Vol. XI, No. 1 (Chicago: The University of Chicago Press, 1940), pp. 92-98. Cited hereafter as Anticipations.

interpretation which is consistent with the following definition of ex-ante profit and with the nature of decision making based on profit maximization.

The Expectational Horizon

Although as nebulous a concept as the discount rate the theoretical implications of the notion of an expectational horizon are less complicated. The expectational horizon can be viewed either as a number of periods or as a moment in the future. The former interpretation is the one adopted here. One can then speak of the length of the expectational horizon or the length of the horizon.

The length of the horizon is defined as the number of periods over which management converts estimated outcomes of its alternative courses of future conduct into certainty equivalents.¹ The implications of the existence of a horizon are adequately expressed by Edwards and Bell.²

The existence of a horizon does not mean that a firm must plan for liquidation at that point, but rather that expected activities beyond that point are so shapeless that returns above normal interest on the market value of assets then held can not be contemplated.

In other words: management has no definite expectations as to what it can attain above the normal interest rate beyond the horizon. The normal interest rate may be viewed as equivalent to what has been defined before as the discount rate. Although usually stated

¹Economists have generally been reluctant in giving an opinion on the length of the horizon. An exception is found in B. S. Keirstead, An Essay in the Theory of Profits and Income Distribution (Oxford: Basil Blackwell, 1953), p. 37.

²Edwards and Bell, op. cit., p. 35.

in rather vague terms, the interpretation of Edwards and Bell can be seen as the traditional one in economic literature.¹

Ex-ante Profit Defined

From now on subjective value refers to all the operations of the firm, either planned or in process of being carried out. It is assumed first that the firm's management recognizes but one course of action. As indicated previously, all items of all expected streams of net receipts are supposed to be discounted at the same rate throughout. In the following analysis V stands for the firm's subjective value, while subscripts refer to the moments at which estimates are made and superscripts refer to the moments for which estimates are made. Management can discount to all moments within the expectational horizon and to any moment in the past. All moments are ends of periods, the end of period 0 coincides with the beginning of period 1.

A concept closely related to the notion of subjective value is what will be called here subjective ex-ante income. It is defined as the amount of money that could be withdrawn from the firm at the end of the next future period without reducing its subjective value as it is estimated now.² It follows from the nature of the discounting

¹In the next chapter it will be seen that the continuity assumption allows for a different interpretation of the expectational horizon. Most authors, including Edwards and Bell, do not make that assumption explicitly.

²This is basically the same definition of subjective ex-ante income as the one adopted by Marschak, Hicks, Lindahl, and Edwards and Bell. None of these authors has distinguished ex-ante income from ex-ante profit.

process that subjective ex-ante income is proportional to the discount rate and the firm's subjective value. Other things being equal, it follows that this income figure will be lower the smaller the number of periods management has taken into account in determining the firm's subjective value.¹

Subjective ex-ante income was defined as the prospective increase of the firm's subjective value over one period. For period 1 it can be expressed as $Y_0^1 = V_0^1 - V_0^0 = r V_0^0$, if Y_0^1 stands for the firm's subjective ex-ante income in period 1 and if $100r$ is the interest rate used in discounting the expected net receipts. In order to develop subsequently the definition of subjective ex-ante profit it is convenient to follow the analysis of Edwards and Bell.

These authors have defined two additional concepts besides subjective ex-ante income, namely, the (exit) market value of the firm's total assets (M) and the firm's subjective goodwill (G).² It holds by definition that $V_j^1 = M_j^1 + G_j^1$. The firm's subjective goodwill can be viewed as the difference between the firm's (expected, present or past) market value at some moment and the firm's market value at the same moment if the "market" had shared the firm's expectations. Assuming profit maximization, the execution of any

¹This leads to the conclusion that, other things being equal, the more "farsighted" management is, the more it is willing to accept negative net receipts in the immediate future. That is, the more it is willing to invest in new operations, to change existing operations and to modify the firm's product line.

²The exact definition of the exit market value of a firm provides some technical difficulties. For the present purposes it can be interpreted as the sum of the exit market values of the firm's assets minus its debts. Edwards and Bell do not subtract the firm's debts. This subtraction is necessary here because interest payments and repayments made on debts are not included in the firm's expected net receipts.

plan can be interpreted as an effort on the part of management to convert subjective goodwill into actual market values.¹

Subjective ex-ante net returns in the first period (N_0^1) are defined as subjective ex-ante income (Y_0^1) minus subjective ex-ante cost (C_0^1). The subjective ex-ante cost of carrying out a selected plan can be defined as what management gives up in terms of the best alternative plan considered (opportunity cost). Management starts off with total assets having a given market value of M_0^0 .² If it is assumed that the best alternative plan at the beginning of period 1 is to put out a sum of M_0^0 at an interest rate of $100r$, it follows that $C_0^1 = r M_0^0$. Subjective ex-ante net returns at that moment can be expressed as $N_0^1 = r (V_0^0 - M_0^0) = r G_0^0$.

In period 1 opportunity cost will generally be $C_0^1 = r A_0^0$, where A_0^0 represents the subjective value of the best alternative plan at the moment in the opinion of management.³ It follows that N in period 1 is generally equal to: $N_1^{1+1} = r (V_1^1 - A_1^1)$. If B_1^1 stands for the subjective goodwill corresponding to A_1^1 , the last equation can be rewritten as $N_1^{1+1} = r (G_1^1 - B_1^1)$.

It follows that N_1^{1+1} may be considered a subjective ex-ante profit concept. It implies that no investment whatsoever will be made by the firm if its subjective ex-ante net returns are not positive.

¹This conversion process is demonstrated in Edwards and Bell, *op. cit.*, pp. 48-51. Note that this is an anticipated process, rather than an actual one.

²This implies that management does not issue stocks.

³From now on management is supposed to envisage several alternatives. The firm's subjective value is now identical with the subjective value associated with the most profitable course of future conduct.

Investment in this case includes putting out the total market value of the firm's assets on a savings account, or even keeping it in liquid form. It is pointed out that $N_1^{i+1} = 0$ if $G_1^i = B_1^i$, indicating indifference between two plans. This concept, though not incorrect, is unmanageable in theoretical analyses of the kind presented below and, therefore, rejected.¹

Instead, the following definition of subjective ex-ante profit (P) is suggested: $P_1^{i+1} = r G_1^i = r (V_1^i - M_1^i)$. Here G_1^i is the subjective goodwill of the plan with the highest subjective goodwill. An important property of this definition is that it also leads to acceptable results if management is allowed to engage in borrowing and lending activities and in the issue of stocks, which implies that M_1^i is not fixed. In this case that plan will be selected which has the highest subjective goodwill because of the profit-maximization assumption.² This maximizes P_1^{i+1} but not necessarily N_1^{i+1} and V_1^i . However, if M_1^i is fixed, maximization of G_1^i implies maximization of V_1^i . The assumption that management maximizes the firm's subjective ex-ante income is only applicable if the firm does not engage in the issue of stocks.³

¹There is a case where this concept is preferable to the one developed below. See the discussion of the maximand of Buchanan in ch. v.

²A slightly different criterion is applied by Norman S. Buchanan, "Theory and Practice in Dividend Distribution," The Quarterly Journal of Economics, Vol. LIII (November, 1938), pp. 64-85, especially p. 66n. Cited hereafter as "Dividend Distribution," Buchanan's views concerning the managerial maximand are discussed more fully in ch. v.

³Edwards and Bell state explicitly that "it is the maximization of subjective goodwill that is the general criterion for choice among alternatives." Op. cit., p. 38.

The suggested subjective ex-ante profit concept implies a cost concept that differs from opportunity cost in this important respect that $r M_1^1$ is a more or less "objective" concept while opportunity cost ($= r A_0^0$) is subjective in nature. It is appropriate to define $r M_1^1$ as objective opportunity cost.¹ The objectivity of $r M_1^1$ is of course not absolute. Imperfections in the money and goods markets can make it impossible to determine either r or M_1^1 . It will be assumed, however, that $100r$ is identical to the interest rate on government bonds and constant over time, and that market value of each of the firm's assets can be determined unambiguously.

The borrowing rate of interest may be and usually will be higher than $100r$. The impact of these higher interest rates on non-equity capital is felt only in selecting the best plan. As was argued before, the discount rate applied in estimating V_1^1 can not be the borrowing rate of interest. The only consequence of borrowing is that the expected net receipts will be lower, the higher the interest payments and refunds necessary in the future. Both influences tend to lower V_0^0 , but do not increase cost. It is not possible for management to engage in unprofitable activities by applying a lending rate of interest in the discounting process, provided that

¹For a quite different interpretation of cost see Buchanan, Corporate Enterprise, pp. 184-185. He distinguishes cost from net income (subjective ex-ante profit) in each item of the stream of net receipts. **This procedure is not very meaningful.** Another interpretation of costs is implicit in Buchanan's Dividend Distribution." It can be inferred that in this article he suggests a concept comparable to what in the present study is called subjective opportunity cost.

net receipts are correctly interpreted, that is, net of interest payments and refunds. It is correct to state, therefore, that any plan is profitable as long as its subjective goodwill is positive, no matter how large the difference is between the borrowing rate of interest and $100r$.

Assume that the expectational horizon is limited to n periods after the present period 0. The traditional interpretation of the expectational horizon implies that $P_0^k = 0$ for any $k > n$. This, for some authors, seems to imply the proposed liquidation of the firm after n periods.¹ Of course, the horizon shifts and thus the firm may never be actually liquidated. If $P_0^k = 0$ it does not follow that also $P_k^k - 1 = 0$. It only means that the making of profit after k periods can not be contemplated and that management can not think of any better plan than holding its assets from then on in liquid form. The expectational horizon in the traditional interpretation can now also be defined as the number of periods beyond which management at this moment expects the firm's net receipts to be constant and perpetually equal to $r V_0^n = r M_0^n$.²

¹The horizon is sometimes explicitly defined as the number of periods the firm is expected to exist or simply as the firm's expected lifetime. See, for instance, Lindahl, op. cit., p. 97. See also Buchanan, Corporate Enterprise, p. 184 and Hart, Anticipations, p. 14. Edwards and Bell do not take this position. Op. cit., p. 35.

²This interpretation of the traditional concept may seem rigid. One may say that in the traditional interpretation $G_0^n = 0$; the expected net receipts pattern after period n can then have any shape corresponding to this condition. See also below, ch. iii, where exception is taken to the traditional interpretation of the expectational horizon and the nature of managerial expectations.

Concepts Related to Subjective Ex-ante Profit:
Subjective Ex-post Profit and Unexpected Profit

The objective ex-post profit concepts to be dealt with in chapter iv are not closely related to ex-ante profit as defined in the previous section. Those notions of ex-post profit are related to the minimum goal of the firm--its survival. The analysis of objective ex-post profit is independent of the maximand of the firm. This does not apply for subjective ex-post profit. For this reason it is preferable to discuss the last concept in the context of profit maximization. The same holds for the notion of unexpected subjective ex-post profit.¹ For reasons of exposition, only the ex-post concepts of the first period are discussed. Stock issues are presumed not to take place and management does not distribute any dividends.²

Subjective ex-post income of the first elapsed period (Y_p) has been defined by Edwards and Bell as $Y_p = V_1^1 - V_0^0$. Subtracting subjective ex-ante income from this expression gives their concept of unexpected subjective ex-post income (for the sake of briefness called here unexpected income). It follows that the unexpected income of the first period (Y_u) can be expressed as $Y_u = V_1^1 - V_0^1$.³

¹At least one economist holds the position that profit is by its nature unexpected and unanticipated. Profit maximization in such a context is obviously meaningless. See J. Fred Weston, "A Generalized Uncertainty Theory of Profit," The American Economic Review, Vol. XL (March, 1950), pp. 40-60. Weston's analysis does not pertain to the contents of this study. It deals with profit in the theory of income distribution, rather than in the theory of managerial decision making.

²An alternative assumption could be that management distributes minimum dividends and considers these as "costs" of the firm's activities.

³Cf. Edwards and Bell, op. cit., pp. 42-43. Note that the authors call these concepts respectively subjective ex-post profit and unexpected profit, rather than income.

A discussion of these matters is also found in Lindahl.¹ In his terminology $V_1^1 - V_0^1$ is total gain.² The value of $V_1^1 - V_0^0$ is called the actual change in the value of wealth.³ Total gain consists of capital gain, defined as $V_1^0 - V_0^0$, and income gain. Since it holds by definition that $V_1^1 = (1 + r) V_1^0$ and $V_0^1 = (1 + r) V_0^0$, it follows that the firm's income gain is equal to $r (V_1^0 - V_0^0)$, which is identical to r times the capital gain.⁴

Marschak distinguishes four kinds of "Vermögenszuwachs," (value increment). He defines $V_0^1 - V_0^0$ as ex-ante investments. This, of course, is equal to $r V_0^0 = Y_0^1$ which, indeed, he calls ex-ante income.⁵ The value of $V_1^1 - V_1^0$ is defined as ex-post investments. Finally, $V_1^1 - V_0^0$ is defined as "nomineller Vermögenszuwachs." The concept $V_0^1 - V_1^0$ is discarded as being useless.⁶ Ex-ante income

¹Lindahl, Money and Capital, pp. 101-108.

²Ibid., p. 191. Lindahl's total gain is unexpected income of Edwards and Bell. See below.

³This is what Edwards and Bell call ex-post income. The terminology of Marschak comes closest to that of Lindahl, he speaks of "nomineller Vermögenszuwachs." Marschak and Lederer, op. cit., p. 13.

⁴It must be emphasized that the relationship does not hold if the interest rate (c.q. the discount rate) is not constant. Inspection of his statements about the relationships of the various concepts discloses that Lindahl defines prospective savings as $V_1^1 - V_0^0$. See Lindahl, Money and Capital, p. 108. On p. 99 he defines it as income from capital. This is exactly what in the terminology of Edwards and Bell is defined as subjective ex-ante profit and what in the present study has been called ex-ante income. Lindahl defines retrospective savings implicitly as $r V_1^0$.

⁵Marschak and Lederer, op. cit., pp. 12-13. Thus Marschak's ex-ante income equals his ex-ante investment and is also equal to Lindahl's ex-ante savings.

⁶It is interesting to note that Marschak does not consider $V_1^0 - V_0^0$ (Lindahl's capital gain) and $V_1^1 - V_0^1$ (Edwards and Bell's

is defined as $r V_0^0$ and ex-post income as $r V_1^0$. The difference between these two, $r (V_1^0 - V_0^0)$, is called "dynamischer Gewinn" (dynamic profit). This is identical with Lindahl's income gain.

The following observations are made. The assumption that the discount rate is constant is maintained throughout. Subjective ex-ante income has been defined as $r V_0^0$ by all authors cited. It seems logical to follow Marschak in defining subjective ex-post income as $r V_1^0$. Unexpected (subjective ex-post) income is consequently equal to $r (V_1^0 - V_0^0)$. This is identical with income gain of Lindahl and dynamic profit of Marschak. On the other hand, $V_1^1 - V_0^0$ expresses the increase (c.q. decrease) of the well-being of the firm over the last period as felt by its management. This is the "actual change in the value of wealth" of Lindahl (an excellent term) or the "nominal value increment" of Marschak. The term of Edwards and Bell for this concept, ex-post income, seems less useful.

Write $V_1^1 - V_0^0$ as $(V_1^1 - V_1^0) + (V_1^0 - V_0^0)$. Since $V_1^1 = (1+r) V_1^0$ the first term reduces to $r V_1^0$, that is, ex-post income. The second term can be interpreted as the capitalized value of the firm's unexpected income. Following Lindahl it can be called capital gain. The actual change in the value of wealth in this terminology is equal to the firm's ex-post income plus its capital gain. In other words, the actual change in the value of wealth equals ex-ante income plus unexpected income (income gain) plus capital gain. It is also equal to ex-ante

unexpected income) genuine "Vermögenszuwachse." He states mistakenly that these differences "haben nur je einen Bezugspunkt, sind also bloße Vermögensumwertungen." See Marschak and Lederer, op. cit., pp. 12-13, especially p. 12, n. 1 and n. 2.

income plus total gain.¹ The terminology accepted here comes closest to the one of Lindahl. Next, the concept of unexpected profit must be discussed.

Although $V_1^1 = (1 + r) V_1^0$ and $V_0^1 = (1 + r) V_0^0$ (because the V 's in both cases imply the same net receipts), similar relations do not necessarily hold between G_1^1 and G_1^0 on one hand, and G_0^1 and G_0^0 on the other hand. The reason is that in general $M_1^1 \neq (1 + r) M_1^0$ and $M_0^1 \neq (1 + r) M_0^0$. As subjective ex-ante profit was defined as $r G_0^0$, a parallel definition of subjective ex-post profit (P_p) would be $r G_1^0$, where G_1^0 is the firm's subjective goodwill as management at the end of period 1 thinks it should have been estimated at the beginning of the period. Subtracting the expression for P_0^0 from P_p would give the following definition of unexpected (subjective ex-post) profit: $P_u = r (G_1^0 - G_0^0)$.

This concept of unexpected profit shows more than just a convenient analogy with unexpected income (Y_u), defined above as $r (V_1^0 - V_0^0)$. It will be recalled that $V_1^1 = G_1^1 + M_1^1$. Some reflection shows that $M_1^0 = M_0^0$. It follows that the expression for Y_u can be reduced to $r (G_1^0 - G_0^0)$. In the present framework unexpected income is identical with unexpected profit. Thus, changes in actual market values can not be analyzed by comparing unexpected income and unexpected profit.²

¹It will be seen that unexpected income in the terminology of Edwards and Bell ($V_1^1 - V_0^1$) is equal to total gain (capital gain plus unexpected income).

²It will be seen below that it is for exactly this reason that Edwards and Bell have rejected the terminology of Lindahl.

Both V_1^1 and G_1^1 refer to the plan that is considered most profitable at the end of period 1. In other words, these concepts refer to the firm as it will enter the second period. This means that expectations may have been changed already and that management may already have decided to take up a course of action different from the one it originally anticipated to carry out in the second period. The problem is under what circumstances and in which respect managerial expectations and plans are changed. What management ends up with in this decision-making process is indicated by Y_1^1 and P_1^1 ; Y_u (equal to P_u) indicates to what extent the expectations entertained originally were wrong. Thus, the concepts Y_u and P_u do not play any role in the decision-making process itself. Instead, they are the results of it. The value of these variables is only given when another best plan has already been selected. Both concepts are, therefore, useless for the problem stated above.

One can introduce the concept g_1^0 indicating the subjective goodwill of the firm as it should have been estimated in the opinion of management at the beginning of the period if the originally anticipated plan were expected to be carried out in period 2 and thereafter. Thus g_1^0 is the subjective ex-post goodwill of the original plan. It is by definition impossible that $g_1^0 > G_1^0$ since G stands for the best plan, but if $g_1^0 < G_1^0$ it follows that at the end of period 1 some other plan is considered better than the one management originally thought it would carry out in the second and following periods. Expectations may have been changed if $g_1^0 \neq G_1^0$ (namely if $G_1^0 - G_0^0 \neq 0$) but the plans will not be changed.

Management is supposed to maintain the original plan if at some moment indifference between plans arises.

One can now define $r(G_1^0 - G_0^0)$ as unexpected subjective ex-post profit in a broad sense and $r(g_1^0 - G_0^0)$ as unexpected subjective ex-post profit in a narrow sense. Unexpected profit in a narrow sense (P_{un}) indicates how the profitability of the original plan changes in the light of the experiences of the past period; P_u in a broad sense (P_{ub}) indicates to what extent the total profit outlook of management has been changed. The value of $P_{ub} - P_{un} = r(G_1^0 - g_1^0)$ determines the "extra" unexpected subjective ex-post profit which arises if management at the end of a period considers alternative possibilities besides the original plan. It may be considered a reward for what may be called managerial "broadmindedness." The value of $P_{ub} - P_{un}$ is by definition non-negative and can arise even if P_{un} is positive.

Not enough attention has yet been paid to the considerations which lead Edwards and Bell to accept $V_1^1 - V_0^0$ (the change in wealth over the previous period) as the definition of ex-post income. The reason is that the authors were not primarily concerned with subjective ex-post profit as such, but with the problem of how to isolate the objective element of changes in the firm's subjective value over time. This objective element was found to be the change in the firm's (exit) market value over time. It was indicated that the definition of subjective ex-post income (c.g. profit) adopted here is truly subjective in that respect.

Ex-post income in the sense of Edwards and Bell can be written as $(G_1^1 - G_0^0) + (M_1^1 - M_0^0)$. This implies that at least part of its value can be objectively determined. In the same way the authors are able to distinguish an unexpected increase in the firm's market value, $M_1^1 - M_0^1$, from an expected increase, $M_0^1 - M_0^0$. They introduce these notions as a contribution to the theory of ex-post profit determination. Their line of thought will not be further discussed here. It is more appropriate to deal with it in the context of chapter iv, where several ex-post profit concepts are discussed in connection with the establishment of the concept of the minimum goal of the firm.

Summary: Decision Making Under Profit Maximization

The previous discussion can be conveniently summarized by describing the way in which management might select its future activities. Again, the theory can provide at most a way of visualizing the process of decision making under the assumption of profit maximization. It is necessary to compare the profit concept developed above with the one traditionally employed in the theory of the firm or, rather, the marginal analysis. This is done in the second part of this section.

The Process of Decision Making

At some moment management can be supposed to face several possible courses of future action. It will probably not recognize all the available opportunities. That is, it may overlook the

objectively most profitable course of future conduct if it lacks "boradmindness."¹ Each of the alternative plans is characterized by a stream of expected net receipts. These net receipts represent certainty equivalents of estimated possible outcomes. The net receipts in the various periods can be interdependent. Because the productive operations of the firm can be stopped at any future moment, the number of periods over which the various net-receipts patterns associated with technical operations extend need not be the same. An example is a production plan which would involve negative net receipts after period 1 for $1 < n$. Generally a firm will not now be expected to be operated in a technical sense under a specific plan after period 1 if $G_0^1 \leq 0$.² Management will plan to hold the firm's assets in liquid form after period 1.³ The traditional interpretation of the horizon implies that $G_0^n = 0$ and that $V_0^n = M_0^n$ for any plan. The latter expression emphasizes the

¹This is the essence of Alchian's argument. The proposition states that profit maximization in an objective sense is unlikely. It does not allege that it is impossible. Management can have the versatility (or luck) of choosing the best plan. See also the first section of this chapter.

²Here G refers to that particular plan rather than to the best plan.

³A plan may thus involve the transformation of all of the firm's non-monetary assets into liquid form at some moment within the expectational horizon. A plan may also involve the holding of non-monetary assets over time without any products actually being produced. This may be done, for instance, in anticipation of price increases of such assets. In that case the firm only engages in holding activities. See also below, ch. iv.

process of profit maximization as being an effort to convert subjective goodwill into actual market values. The length of the expectational horizon, the value of n , depends on management's "farsightedness."

Management will select the plan which represents the highest subjective goodwill for the firm.¹ Maximization of the firm's subjective goodwill implies maximization of its subjective ex-ante profit if the same discount rate is applied to all alternative net-receipts patterns. The firm's net receipts after period n are now expected to be $r V_0^n = r M_0^n$.

What determines managerial farsightedness and broadmindedness in practice is a matter of considerable conjecture. The following observations seem, however, to be in order. The concept of subjective value which is the starting point for all the subjective income and profit concepts has been shown to be convenient in explaining and visualizing managerial investment decisions. The economists' technique of determining subjective values does not demonstrate how management actually formulates it. If profits are maximized, however, it is undeniable that, in some way or another, subjective value and subjective goodwill are formulated in order to make decisions as to future actions. Although it was assumed so in the previous discussion, it is less obvious whether management also tries to estimate subjective ex-post profit. It is not impossible

¹This plan may involve a combination of several activities. The best plan will have the property that a change in the scale of any one of the planned activities in any period involves a reduction in the firm's subjective goodwill.

and it may even be likely that the formulation of this profit figure is restricted to a feeling of satisfaction or dissatisfaction about events in the recent past (retrospective welfare determination).¹

Under the assumption of profit maximisation the role which is usually attached to unexpected subjective ex-post profit is to help management decide upon the question whether or not it should revise its plans. It was shown, however, that this does not hold for this profit concept in the broad sense because it already implies revised plans. Theoretically, management changes its plan if $r(G_1^0 - g_1^0)$ is positive (where G refers to the best plan, g to the original plan). Whether such changes take place in reality depends on many factors, the most important of which are the sacrifices involved in changing from one course of action to another and the length of the expectational horizon (managerial "farsightedness").

Some other factors influencing the decision are the certainty with which past and present expectations are held, the extent to which management is aware of the amounts of unexpected profit (as defined above), the number of alternatives it considered in the past and considers at the present moment (managerial "broadmindedness") and how far at the moment of decision making the firm's plans have already been advanced. This list of factors should not be considered exhaustive; ~~neither~~ are the factors independent of each other; the only intention is to show the intricacy of the problem.²

¹Of course there is no point in defining subjective ex-post income and profit in the way suggested in this chapter if the assumption is made that management does not pursue maximum profits.

²See also Hart, Anticipations, pp. 27-32.

If the formulation of the unexpected subjective ex-post profit figure is restricted to feelings of satisfaction and dissatisfaction as described above, it is likely that these feelings are associated with the original plan. One can tentatively expect that management does not change its plan if $g_1^0 > G_0^0$ if G also refers to the original plan, because in that case it may not consider any alternatives which might lead it to the conclusion that $G_1^0 > g_1^0$. If a feeling of dissatisfaction prevails, management is more likely to be induced to consider alternatives, although this need not necessarily lead to a change in its plans (namely if $G_1^0 = g_1^0$). But even in this case it may maintain the old plan as long as g_1^0 is positive. Profitable plans may be taken up in addition to the original plan, and this will, in general, indicate growth.

One can argue then that the "broadmindedness" of management is to some extent determined by the amount of unexpected profit. If management feels dissatisfied it may look for "better" plans, if it feels satisfied, it may look for activities in addition to those currently performed. It follows that the firm's subjective ex-ante profit is not independent of its unexpected profit over the last period.

Profit in the Traditional Marginal Analysis: A Comparison

It can be shown that the profit concept adopted in the traditional theory of the single-product firm does not differ substantially from the profit concept developed in this chapter. In the theory of the firm ex-ante profit associated with a specific plan is defined as the difference between ex-ante revenues and ex-ante costs. The plan which maximizes this difference is optimal. The optimal

plan implies a decision about the output of the firm (perfect competition) or about the firm's output and the price of its output (imperfect competition).

It must be emphasized that the traditional presentation of the analysis is not necessarily a short-run one. The crucial point is that management's (or the entrepreneur's) expectations are assumed to be constant over time. That is, management expects all relevant conditions to be constant for an infinite number of periods to come.

It is assumed that the lifetime of the firm's fixed assets is known and that management bases the depreciation of each asset on the recovery of an identical asset in the period it wears out. In addition, the age distribution of the firm's assets must be such, that the depreciation allowances are constant in time and in each period equal to the financial requirements of replacing the assets whose lifetime ends in that period. In other words, the financial requirements of the firm must in each period be equal to its replacement requirements.¹ Under these conditions any consistently applied method of allocating the depreciation charges over the assets' lifetime will render the same result. It follows that under the given assumptions, the firm's ex-ante investment outlays are always equal to its ex-ante fixed costs and, therefore, that ex-ante profit in the

¹The financial requirements of the firm in any period refer to the investment outlays necessary to replace the fixed assets worn out in that period; the replacement requirements in any period refer to the (hypothetical) money outlays which would be necessary to replace the services of the assets used in that period. See also Edgar O. Edwards, "Depreciation and the Maintenance of Real Capital," Depreciation and Replacement Policy, ed. J. L. Meij (Amsterdam: North-Holland Publishing Company, 1961), pp. 46-140, especially pp. 107-112.

interpretation of the theory of the firm in all periods is equal to the expected net receipts in all periods. No growth or decline in size is contemplated--only the selection of the firm's optimum size. If growth occurs, it is incidental to the pursuit of profit and takes place only if expectations change.

The subjective value of the expected stream of constant net receipts over an infinite number of periods is equal to the amount of each net receipt divided by the discount rate. It follows that the firm's subjective ex-ante income is equal to the amount of each expected net receipt. Therefore, profit in the traditional theory of the firm is identical to what has been called here the firm's subjective ex-ante income and what Edwards and Bell have called subjective ex-ante profit.

This completes the reconciliation, provided that the entrepreneur's time preference is based on utility considerations. This is in accordance with the traditional theory of the firm. The entrepreneur is supposed to maximize his utility via the maximization of his income. His income is equal to the amount of money which he can withdraw from the firm period without impairing its subjective value.¹ This amount of money was shown to be equal to the periodical net receipts which in turn equal ex-ante income.²

¹The question of what discount rate is used to determine the firm's subjective value is irrelevant. The expected net receipts are constant over time. The firm's subjective value equals the amount of net receipts per period divided by the discount rate. But the firm's subjective ex-ante income is equal to this discount rate times the firm's subjective value, that is, the amount of net receipts per period.

²It will be seen that the introduction of short-run versus long-run cost curves will complicate the argument. Specifically, the distinction between short-run profits and long-run profits requires considerable caution. This is a problem which falls outside the scope of this study and is, therefore, not further discussed.

CHAPTER III

LONG RUN PROFIT MAXIMIZATION UNDER THE CONTINUITY ASSUMPTION

In this chapter an effort is made to reconcile the theory of profit maximization as set forth in the previous chapter with the continuity assumption. The continuity assumption implies that management does not contemplate the liquidation of the firm at any moment in the future.¹ The assumption represents a state of mind on the part of the firm's managers. The application of the continuity assumption to the theory of business behavior leads to some interesting conclusions about the managerial maximand and the process of managerial decision making. The purpose of the present chapter is also to investigate the validity of the assumption that management in fact attempts to maximize profit. Some suggestions are made as to the motivation which may lead management to profit maximization.

In this chapter only the implications of the continuity assumption for the maximization process are discussed. It can be shown that this assumption has implications for business behavior from still another point of view. It is fairly generally admitted

¹Liquidation in the present study refers to the discontinuance of the firm's ownership of assets caused by the distribution of the firm's total assets to its stockholders. The mere conversion of non-monetary assets into liquid form need not involve the liquidation of the firm in this sense. Merger and acquisition phenomena are not considered. That is, the assumption is made that management does not consider merger and acquisition at any time.

that no actual maximization process is free from restrictions on managerial actions. The chapter following the present one is meant to suggest an outline of a theory of managerial constraints based on the continuity assumption. In the two chapters as a whole it is endeavored to develop what might be called a generalized theory of managerial maximization.

The Continuity Assumption: Its Origin and Use

Before the existence of management-controlled corporations, many enterprises could certainly not be considered economic entities which had an indefinite lifetime. Consecutive ventures, even by the same owners, were treated as essentially independent enterprises, each of which gave rise to either a profit or a loss and which lasted a relatively short number of periods. Each venture was essentially an investment in itself and, as such, a means to "making money."¹ The present firm, especially the modern corporation, is quite different in two important respects. (1) In a majority of cases the existence of a modern firm does not end with the death or retirement of one or more of its owners; its lifetime is indeterminate. What is more important, the stockholders as well as the managers of a firm are aware of this. They do not interpret the firm as a venture but rather as an entity with which they are only temporarily associated and which provides them with a more or less regular income. (2) The nature of the firm's activities with regard to the actual production process has become dominantly of the "continuous input, continuous output" type.² The

¹Cf. Eugen Schmalenbach, Dynamic Accounting, trans. G. W. Murphy and Kenneth S. Most (London: Gee and Company Limited, 1959) especially pp. 11-24.

²See Friedrich and Vera Lutz, The Theory of Investment of the Firm (Princeton: Princeton University Press, 1951), pp. 5-11.

various transactions of the firm, therefore, can no longer be considered independent of each other.

These two features which are characteristic of almost all corporations (and possibly of most other existing firms) are implicit in a majority of the objections directed against the accountants' method of profit determination. These objections have lead to the development of the continuity idea, which is especially found in European treatises on ex-post profits.¹ In the context of ex-post profit determination the continuity assumption implies that the further existence of the firm should not be endangered by the way the profit figure is determined.² As a consequence of their use of the continuity assumption the students of industrial economics in Germany and The Netherlands have been preoccupied with the analysis of the stationary firm in a changing economy, where stationary means constancy in "size." As a result, maximizing behavior on the part of the corporate firm has been neglected. Neither growth nor the activity of establishing new firms has been dealt with to any extent in that line of thought.

Although the contrary is sometimes suggested in European writings on ex-post profit, it must be emphasized that the continuity assumption does not have universal application to the present-day economy. In other words, there exists no continuity principle. It is possible for a corporation (or any firm) to be established for a

¹The continuity idea corresponds with the concept of the "going concern" which is often found in accounting literature in the United States.

²In the writings referred to, it is usually assumed that all of the firm's ex-post profit is (or could be) distributed apart from some reservations for future sacrifices.

specific purpose as, for instance, treasure digging. A firm may be liquidated also because its prospects are considered unfavorable. The managers of most modern corporations are aware that the firm will probably survive them, and they usually have no intention of promoting its liquidation under normal conditions.¹ The possible exceptions make it preferable to speak of the continuity assumption rather than the continuity principle.²

The Horizon Reconsidered

In chapter ii the expectational horizon has been dealt with as the number of periods over which management maximizes profit. No specific expectations were supposed to be entertained about those future events falling beyond the horizon. Therefore, no plans are made for actions at a time more than n periods from the present. The expectational horizon was defined as the number of periods (n) beyond which management at this moment expects the firm's net receipts to be constant and perpetually equal to $r V_0^n = r M_0^n$, where r is the discount rate, V_0^n is the firm's subjective value, and M_0^n the firm's exit-market value as management expects them to be after n periods. This implies that G_0^n is by definition equal to zero. The expectational horizon is supposed to be finite.

Edwards and Bell have stated that the firm's expectations beyond the horizon are so "shapeless" that returns above normal interest on the market value of assets then held can not now be contemplated.³ This

¹This holds in many cases even for the one-man business firm.

²See also Meij, Leerboek, pp. 30-33.

³Edwards and Bell, op. cit., p. 35.

point merits some further investigation. Suppose that a going concern has been profitable for, say, about a generation and that its management tries to maximize the firm's profit. The continued existence of the firm in the past implies by definition that management has at any moment expected positive ex-ante profits. It is not realistic to assume that after this experience management will continuously expect profits to be zero beyond the horizon unless ex-ante profits in the past have showed a definite downward trend which, if extrapolated n periods into the future, would induce management to expect zero profits beyond period i (where $i \leq n$).

If ex-ante profits in the past were relatively stable from period to period or if they fluctuated around a central value, it seems reasonable to assume that management expects the firm to be potentially profitable for an indefinite time to come. Management knows that its horizon shifts over time. On the basis of past experience it knows that opportunities always existed beyond earlier horizons. Therefore, it may now expect that there are opportunities, albeit undefined, beyond the present horizon. This amounts to the observation that the firm's decision makers are optimistic about the firm's prospects in the long run.

Such expectations can be shapeless. In fact, it is very convenient to define the expectational horizon as the number of periods beyond which expectations are shapeless. Shapeless in this context means that management does not yet know the nature of the opportunities in the far future and the markets where they may arise. But it believes that these opportunities will become apparent with the passage of time.

In other words, management is aware of the likelihood of opportunities arising in the far future.¹ No definite plans can as yet be made as to the means of exploiting the potentially existing profitable opportunities. But the recognition of the possibility that these opportunities may arise should certainly be expected to influence managerial policies in some respects.

It follows from the previous argument that, if management acts as indicated, G_O^n is not equal to zero but is, instead, positive. To be sure, management can not now choose between alternative courses of actions which will take place beyond the present horizon. It can only expect that opportunities will arise. In other words, there exists a sort of subjective goodwill **above** the goodwill associated with the alternatives presently envisaged.

The firm's total subjective goodwill can now be expressed as $G_O^0 + G_X$ if G_X stands for $\frac{G_O^n}{(1+r)^n}$ and if G_O^0 refers exclusively to the activities of the firm in the first n periods. That is, G_O^0 is associated with definite expectations, G_O^n (and thus G_X) is associated with shapeless expectations. It is possible to refer to G_X as the present value of managerial optimism in the long run. The firm's subjective value is equal to $V_O^0 = M_O^0 + G_O^0 + G_X^0$. The maximization of G_O^0 will be referred to as profit maximization or as profit maximization

¹Penrose has pointed out that lack of opportunities for an individual firm in a dynamically developing economy is an extremely rare situation. No firm is committed to a specific product, a specific market or a specific technology. Many corporations, especially in the United States, have developed products, markets and technical abilities which are only vaguely connected with their earlier activities. See Penrose, Theory of Growth, p. 44. See also Buchanan, "Dividend Distribution," p. 66n.

over n periods; the maximization of $G_0^0 + G_X$ will be called long-run profit maximization or profit maximization over an infinite number of periods. Long-run subjective ex-ante profit is equal to $r (G_0^0 + G_X)$.

It is possible that the firm's extra subjective goodwill is the same for all alternatives now considered for the first n periods. It is also possible that G_0^n is positively correlated with the exit market value at the end of period n . If either of these cases holds, it follows that under the profit-maximization assumption the choice among the possible activities is independent of the amount of extra subjective goodwill. That is, profit maximization over n periods is in these cases identical with profit maximization over an infinite number of periods. However, many economists have argued that the assumption of profit maximization in the case of management-controlled corporations is unwarranted. Before analyzing long-run profit maximization in more detail it is necessary to discuss the views of these critics.

The Adequacy of the Profit-maximization Assumption for the Explanation of Business Behavior

Some critics of the theory of profit maximization hold that it is impossible for **management** to maximize profits. Their views have been discussed in chapter ii. The theory of profit maximization has been attacked on still other grounds. Some critics state that management does not actually try to maximize profits. Therefore, the profit-maximization assumption can not possibly provide an adequate explanation of business behavior in real life. Some economists have tried to verify the assumption of profit maximization empirically or to explain actual behavior in terms of the traditional (marginal) theory of profit maximization. Their results have been discouraging.

One well-known study is representative of those economists who hold that the profit-maximization assumption must be rejected because there is no empirical support for it. This study was presented by Hall and Hitch in England.¹ Admittedly, their main emphasis is on the use of the marginal analysis in theory and practice, but the rejection of the profit-maximization assumption is frequently based on the alleged failures of this type of analysis. In regard to these empirical studies the following observations seem pertinent.

First, marginalism should not be identified with the maximization of profit. To reject marginal analyses means that the existence of any maximand as defined in chapter ii is denied. Any maximization model involves, implicitly or explicitly, marginalistic procedures.²

Second, there is evidence of confusion in some studies between long-run and short-run analyses. This stems partly from a misinterpretation of the usual assumptions made in the textbook representation of the theory of the firm.³ This point was commented on in the final section of chapter ii.

Third, it is sometimes suggested that decision making which takes non-pecuniary considerations into account can not possibly be aimed at profit maximization.⁴ This procedure can be interpreted

¹R. L. Hall and C. J. Hitch, "Price Theory and Business Behavior," Oxford Economic Papers, Vol. II (May, 1939), pp. 12-49.

²See Fritz Machlup, "Marginal Analysis and Empirical Research," The American Economic Review, Vol. XXXVI (September, 1946), pp. 519-554. Cited hereafter as "Marginal Analysis." However, one might want to reserve the term marginalism for differentiable functions.

³It is not the theory which generally leaves this matter ambiguous but its interpreters. See, for instance, Simon, loc. cit., p. 262.

⁴See, for instance, Boulding, "The Present Position," p. 4.

either as profit maximization subject to "behavioral" constraints,¹ or as merely a form of long-run maximization.²

Fourth, there is a frequent misunderstanding as to the distinction between a theoretical way of visualizing a decision-making process and the "observed" course of events.³ In addition, the crucial distinction between ex-ante profit and the various forms of ex-post profit is not always sharply drawn.⁴

It is not suggested that all researchers have made all the mistakes mentioned above. However, none of the critics of the profit-maximization assumption has so far proved that business men do not in fact maximize profit. This statement is in agreement with the conclusions reached by Machlup in his penetrating study on this matter.⁵

It will be shown in chapter iv that so-called non-economic considerations entering the managerial decision-making process can be reconciled with the maximization of profit. The question still remains whether or not managers actually try to maximize "pure" profits and, if so, what the constraints are to which this maximization process is subject.⁶

¹See below, ch. iv.

²See also C. Michael White, "Multiple Goals in the Theory of the Firm," Linear Programming and the Theory of the Firm, ed. Kenneth E. Boulding and W. Allen Spivey, op. cit., pp. 181-201, especially p. 186. The point is related to the tautology involved in the assumption of utility maximization. See also below.

³This mistake is found, for instance, in Richard A. Lester, "Shortcomings of the Marginal Analysis for Wage-Employment Problems," The American Economic Review, Vol. XXXVI (March, 1946), pp. 63-82. For a criticism of Lester's views on this point see Machlup, "Marginal Analysis," P. 521. See also Machlup's famous analogy of the automobile driver. Ibid., pp. 534-535.

⁴See, for instance, Baumol, Business Behavior,

⁵Machlup, "Marginal Analysis."

⁶The problem of the constraints is dealt with in ch. iv.

Alternative Interpretations of the Maximand

The simplest substitute for the profit-maximization assumption is the assumption that management tries to maximize the value of another single variable. An example is the sales maximization hypothesis advanced by Baumol. The author bases this hypothesis on his experience in business firms.¹

Usually the maximands suggested as substitutes for profit maximization are more complicated than the one suggested by Baumol. Those who feel that non-pecuniary considerations enter the process of decision making often infer that firms (or, rather, their managers) maximize utility or "psychic income." This is the conclusion reached, for instance, by Simon, who seems to favor the assumption of utility maximization subject to a profit constraint. He calls this "satisficing behavior."² The nature of the profit constraint is not clarified by Simon, and this, incidentally, is the most frequent shortcoming of those advancing an alternative maximand.

A somewhat different approach has been suggested by Machlup. He advances the possibility that non-pecuniary considerations (including both satisfactions and dissatisfactions) can be reduced to money terms and thus made part of the profit-maximization scheme.³ He finds, however, that this procedure would reduce the analysis to a system of useless definitions and tautologies. This is also the

¹ Baumol, Business Behavior, pp. 47-48.

² Simon, loc.cit., pp. 262-264.

³ Machlup, "Marginal Analysis," p. 526.

position held by other economists who discuss the use of "empty" utility functions.¹ Many attempts have nevertheless been made in the past to employ preference functions to the theory of the firm.²

Most analyses leave unanswered the question of whether it is necessary to discard the profit motive in analyzing modern corporations. Or, indeed, whether the complexity of managerial problems in large firms has clouded the issues too much to allow the use of the profit-maximization assumption. If the latter is the case, what, if anything, is left of the realism once believed to be implied in the profit-maximization assumption and how is profit maximization related to other possible objectives? In an effort to deal with these problems, it must first be examined how one can conceive of utility maximization in a modern corporation.

Utility as the Managerial Maximand

It was assumed in chapter ii that the reward resulting from the manager's association with a firm is a function of one or more of the firm's decision variables and that this reward is independent of the utility he derives "outside" the firm. This does not mean that the indifference approach, relating inactivity or leisure to money or psychic income, is considered inappropriate.³ It only means that

¹See, for instance, Boulding, "The Present Position," p. 4, and Papandreou, loc. cit., p. 211.

²A recent contribution in this respect is the study of Modigliani and Cohen, op. cit. Other references are given by Simon, loc. cit., p. 263n. and by Papandreou, loc. cit., pp. 207-208.

³Examples of this "consumer approach" are found in Hurwicz, loc. cit.; T. de Scitovsky, "A Note on Profit Maximization and Its Implications," The Review of Economic Studies, Vol. XL (Winter, 1943),

for the purposes of the present analysis, it is necessary to distinguish the manager from the utility maximizer as applied in the theory of consumption.

This distinction ~~seems~~ especially reasonable if it is assumed that decision making in modern corporations is a group activity. Decision making by groups tends to "rationalize" the decision-making process in the sense that more verifiable data are utilized than will generally be the case in individual decision making. It will thus be more difficult for any single person in this group to make personal peculiarities enter the choice of a plan. Personal factors will normally play a secondary role. This lends support to the assumption made in the previous paragraph, namely, that the single manager who in chapter ii was substituted for the group, makes decisions which are relatively independent of his personal circumstances as a non-manager.

The manager maximizes utility through his activities within the corporate organization. The existence of decision-making groups of managers makes it necessary to agree, at least tacitly, on an objective of the firm which is stated in terms of definite variables. No communication pertaining to the selection of a plan is possible in terms of utility. If at all, the objective must necessarily be stated in terms of supposedly measurable variables.¹ Of course, opinions

pp. 57-60, and J. R. Hicks, "Annual Survey of Economic Theory: The Theory of Monopoly," Econometrica, Vol. III (January, 1935), pp. 1-20, especially p. 8. See also Penrose, Theory of Growth, pp. 34-35. Simon, loc. cit., suggests, at least implicitly, the same interpretation of "satisficing" behavior.

¹This may consist only of some sort of agreement on "what is best for the firm."

within the group may diverge as to the measurement of these variables; profit determination is a point in case. Yet it is reasonable to submit that corporate objectives are stated in "tangible", "observable", or "measurable" variables.¹ The group making decisions must agree on a way of measuring the value of the objective and this is why utility maximization is not likely to be the explicit objective of the corporate firm. It is assumed that the single top-manager who in this study represents such a group has indeed converted his objective of utility maximization into an objective of the firm--an objective, the achievement of which can be determined ex post. The link between the firm's objective and the utility of the top-manager consists of a preference function.

The maximand may in some cases be expressed as a single observable variable. If it is profit, one speaks of profit maximization. In chapter v the maximization of other "measurable" variables will be discussed. The objective may be more complicated, however, and in this case the maximand can not be expressed as a function of only one "measurable" variable. This involves the application of some sort of indifference system.² The use of an indifference system is an alternative to the analysis presented in chapter iv.

¹The more explicit communication is about the selection of plans, the more likely it is that the firm's maximand is stated in simple terms. On this point see also George Katona, Psychological Analysis of Economic Behavior (New York: McGraw-Hill Book Company, Inc., 1951), p. 193.

²An example of the use of "measurable" variables is the note of Scitovsky, loc. cit.; a more recent application to the theory of the firm is found in Edgar O. Edwards, "An Indifference Approach to the Theory of the Firm," The Southern Economic Journal, Vol. XXVIII (October, 1961), pp. 123-129.

So far it has been seen that it is not unreasonable to assume that the maximization of profit is possible if this concept is broadly interpreted. This broad interpretation allows for implicit preference functions which express the managers' "attitude towards risk." Besides this qualification, private utility considerations will in general influence the firm's objective and, therefore, the process of decision making. The nature of group decision making makes it possible, however, to think of the firm's goal as being expressed in observable variables which, in principle, allow ex-post measurement. Next, it has to be seen whether this observable variable can reasonably be supposed to be profit. In the following section it will be shown that the existing answers to this question as found in the literature are not always satisfactory.

The Rationale of

Profit Maximization: Present Opinions

It is traditionally assumed that the "entrepreneur" maximizes profit in order to maximize his income and thus his utility.¹ This view of profit maximization has given rise to some doubts as to its applicability to management-controlled corporations. Two lines of thought in support of the assumption can be distinguished. First, it is sometimes held that management maximizes profit as a source of private income for one of the groups of persons (usually the stockholders) associated with the firm. This view fits in with the ownership theory of the firm. Profit in this interpretation is eventually

¹ See above, ch. ii.

meant to be spent on consumer commodities. This can be called the maximization of private income. Second, it is sometimes held that management maximizes profit as a means of adding, in some way or another, to its ~~power~~ and prestige. This interpretation fits in better with the entity concept of the firm.

The views of those who hold that business profits are maximized as a source of private income have been expressed very explicitly by Buchanan. He states that "when we speak of maximizing net income we must necessarily mean maximizing returns to some person or group of persons." He adds that "the primary aim in the conduct of the enterprise is to maximize the net income to the owners."¹ This view results in the identification of profit maximization with the maximization of returns to stockholders. It is obvious that this viewpoint is a simple extension of the traditional concept of the single entrepreneur. The firm is apparently supposed to be run for the stockholders ~~seen~~ as a group. This collectivity is considered to have hired managers to maximize the income of its constituent members. Although satisfactory in the context of the traditional theory of the firm, this interpretation of the maximization process can not be considered realistic for the type of firm adopted in this study.²

The reason for rejecting this interpretation is that modern managers ~~can~~ not be considered as docile representatives of the

¹Buchanan, Corporate Enterprise, p. 179.

²In some cases the remuneration of the firm's stockholders may be the managerial maximand and, for that matter, so may the remuneration of the managers themselves. These, however, should be considered special cases.

stockholders' will in the manner that Buchanan's interpretation would suggest.¹ The fact that company presidents can use the so-called "interests of the stockholders" to defend their actions does not provide evidence to the contrary. Of course, it must be admitted that stockholders can influence a company's policy. However, this does not alter the fact that management actually runs the modern corporate firm.

It is even more likely that management tries to maximize profit if--as is sometimes the case--its own remuneration is an increasing function of the firm's (ex-post) profits.² This interpretation appears to be logical if one is to apply the motivation traditionally found in the theory of the firm to the management-controlled firm. However, it is fairly generally acknowledged that prestige and power are also powerful incentives in managerial decision making.³ In other words, neither the maximization of stockholder's returns nor the maximization of managerial incomes seems to provide a completely satisfactory explanation of the underlying motivation for profit maximization.

The theory of profit maximization has been criticized in the past with the argument that management does not maximize profit but rather its power and prestige. Others hold that profit maximization

¹Elsewhere Buchanan states explicitly that his assumption may be wrong. Yet, the impression remains that he considers the maximization of stockholders' returns the ideal goal of the business firm. See his "Dividend Distribution," pp. 81-83.

²See also Penrose, Theory of Growth, pp. 26-30, especially p. 28n.

³See, for instance, Buchanan, "Dividend Distribution," pp. 81-82 where the author states the limitations of his assumption.

may very well amount to the same thing as the maximization of power and prestige.¹ However, no prestige can possibly be extracted from the firm's subjective value, its subjective ex-ante profit and so on. Anticipated prestige can be associated with ex-ante profit. Actual prestige, on the other hand, is clearly associated with ex-post values, in this case ex-post profit. In addition to maximizing profit for prestige purposes, therefore, management should try to publish high ex-post profits. Thus the maximization of prestige will lead to the maximization of future reported-profit figures. Present prestige may be sacrificed if management feels that by doing so its ultimate prestige can be increased. Evidence shows that managers do not generally try to report ex-post profits as high as they could according to present accounting standards, which indicates that this explanation may be correct.²

Although this brief discussion is not conclusive, one can safely assert that, apart from the prestige motive, the traditional theory has not given an adequate answer to the question of why management in the case of the separation of ownership and control should maximize profits. In the following section an effort is made to provide an alternative means of supporting the validity of the profit-maximization assumption.

¹An example is Penrose, Theory of Growth, p. 30.

²The maximization of prestige is discussed more fully in ch. v, where attention is paid to potential conflicts between long-run profit maximization and the maximization of profit for prestige purposes.

The Pursuit of Viability: A Possible Explanation
of Profit Maximization

As was seen in chapter i, Alchian has stressed the importance management attaches to the survival of the firm. He suggests that management's prime objective is the viability of the firm. It has been assumed in this study that a maximand does exist. Now, if the pursuit of viability by management is accepted as the firm's prime objective, this leads almost automatically to the hypothesis that the managerial objective is to "maximize" the viability of the firm. In this instance management not only accepts the firm's continued existence as having implications for the maximization process, in addition management chooses a maximand which makes it most likely that the firm will survive in the long run. This aspect of continuity as a managerial objective is discussed here; continuity as a minimum condition is dealt with in chapter iv.

The survival of the firm should clearly be associated with the ability of the firm's management to make profits. This has been done very explicitly by Alchian.¹ Although it was shown in chapter ii that he has not dealt with the problem in a very satisfactory way, it is argued here that the pursuit of viability is identical with profit maximization.² That is, management's efforts to establish conditions which are most favorable for the survival of the firm in the long run will lead to selecting the same course of future conduct management

¹Alchian, loc. cit., p. 213.

²This conflicts with the views of Maurer, who remarks that "the aim of enterprise is not immediate or even future maximum profits, once thought to be the goal of all enterprise, but healthy future existence, to which the size of profits is an important but secondary consideration". Herrymon Maurer, Great Enterprise: Growth and Behavior of the Big Corporation (New York: The Macmillan Corporation, 1955), p. 109 and p. 186

would select under long-run profit maximization. Of course, to state that management wants viability does not alter the fact that an explanation has to be given for this motivation.

The difficulties in applying the profit-maximization assumption to the modern corporation really stem from one point, namely, that the separation of ownership and control of the firm tends to disrupt the close ties between utility and profit assumed to exist for the single entrepreneur. In investigating the assumption of profit maximization the question must be asked why management can be supposed to maximize profit in order to maximize its utility. The suggestion made in the present section is that management considers itself more or less as a board of trustees, not only of the firm's stockholders, but of society as a whole.

It has been argued in connection with the continuity assumption that a manager is aware of the fact that, considering the indefinite lifetime of the firm, he is only temporarily associated with it. He himself may feel that the firm can not do without him, but the usual view among managers of modern corporations will be that the firm will continue to exist after they themselves have resigned.¹ After all, the firm existed before management was elected. Management thus considers the corporation as an entity, apart from any specific group of people. Katona has stated this as follows.²

Usually the corporation or business enterprise has psychological reality for at least the executives. It is perceived by them as acting, as having objectives of

¹For strong support of this point and the pursuit of "viability" in general see the lengthy quotation given by Maurer, op.cit., pp. 75-76.

²Katona, op. cit., pp. 196-197.

its own, and as persisting beyond their association with it. The psychological reality of the firm ~~appears~~ to be especially pronounced in the minds of executives when management responsibilities are divided among several persons, as is frequent with many of the large corporations that are not managed by an autocratic president and his subordinates.

Next Katona suggests that the typical manager acts as if the firm he is associated with is his own, "without regard to the special interest of owners, employees, or customers."¹ The author concludes that it is for this reason that management strives after profits.

Management may feel a responsibility towards society as a whole. This includes the firm's stockholders, its customers and its suppliers, but what is more, it may also include the general public. Even if a manager does not feel this sort of responsibility he may still feel that society imposes a responsibility on him.² It does not seem to be an exaggeration to state that society expects any individual to do as good a job as he can, no matter what his occupation may be. Any corporate manager is probably expected to act in the best interests of the firm he is associated with and, what is more, a majority of society's managers can be supposed to be aware of this.³ Thus a manager may feel that his function is

¹Ibid., p. 198.

²That management feels a responsibility towards the community is stressed particularly by Adolf A. Berle, Jr., The 20th Century Capitalist Revolution (New York: Harcourt, Brace and Company, 1954), pp. 61-115 and p. 180. See also Maurer, op. cit., p. 102. For an early recognition of the point made here see Adolf A. Berle, Jr. and Gardiner C. Means, The Modern Corporation and Private Property (New York: The Macmillan Company, 1933), pp. 355-356.

³This may especially be the case for managers who serve more than one corporation as a member of the board of directors. On the phenomenon of "professional management" in this context see, for

"entrusted to him by society. This may mean that the manager feels that he must maximize the firm's long-run profits.¹

Of course, it is not necessary for managers to think that their responsibility extends past the limits of the firm. It is possible that the firm's individual decision makers feel only responsibility towards the groups associated with the firm, that is, the managerial group, the stockholders and, perhaps, the firm's labor force. In either case one can say that a manager derives utility from doing a good job as a businessman and a good businessman is generally believed to be one who is able to make profits.²

Thus in the present interpretation top-management inherits as it were the market value of a specific combination of assets.³ Management tries to bring about conditions which are most favorable for the survival of the firm. This objective is identical with striving after maximum profits. The continuity assumption implies that profits are maximized over an infinite number of periods.

instance, Paul E. Holden, Lounsbury S. Fish and Hubert L. Smith, Top Management Organization and Control (New York: McGraw-Hill Book Company, Inc., 1951), pp. 225-227. Maurer states also that "it is the common habit of contemporary managers to reach decisions on the basis of what will be good for the company . . ." Op. cit., p. 78.

¹It might be pointed out that the profit motive as such has not suffered many large-scale attacks in the past. Instead, it is the distribution of ex-post profits and the unethical means occasionally applied to attain the profit objective which have attracted criticism.

²Cf. Maurer, op. cit., pp. 90-91. This has nothing to do with the pursuit of prestige and power. In fact, the pursuit of these two motives may conflict with the profit objective. This point is investigated in ch. v.

³Of course, these assets are in fact owned by the firm.

It was suggested in chapter i that the viability theory of Alchian can be reconciled with the pursuit of profits. In his interpretation viability is pursued by, among other things, imitating firms which, in the opinion of management, make large profits. Alchian emphasizes the important consequences of uncertainty. However, he neglects the possible existence of definite expectations about future events within the expectational horizon. Consequently, Alchian's theory seems especially applicable to the shapeless expectations entertained about events falling beyond the present horizon. The difference between the theory contained in the present chapter and Alchian's viability analysis is that the latter interprets the present moment in the same way as the expectational horizon is interpreted in this chapter. The objection to Alchian's analysis is that he ignores the existence of the events in periods 0 - n about which definite expectations are held.

The Nature of the Maximization of Longrun Profits.

The maximization of the remuneration of the firm's stockholders is not a likely managerial objective for the type of firm adopted in this study. The question may be asked why management should plan to distribute any dividends at all. There are two reasons for the distribution of dividends. First, management has to pay some minimum dividends, if only to stay in office.¹ Second, any plan of future conduct may call for the issuance of stocks. Management may (and probably will) plan to pay higher than minimum dividends in order to

¹This point is discussed extensively in ch. iv.

ensure a more successful issue. Dividends distributed for any of these two reasons should be considered costs of the firm's activities.

The payment of dividends must be considered one of the means available to management to attain the profit objective and as such the payment of dividends is not intrinsically different from the payment of wages to labor.¹ Dividends are not generally planned as the final result of the maximization process; instead, they are used to attain a result. In the present case this is long-run profits.²

Thus dividend payments are considered by management to be part of the expenditures of the firm. That is, the firm's anticipated net receipts in any period are considered net of the dividend payments planned by management. This, of course, points to the maximization of "retained profits," rather than the maximization of subjective ex-ante profit in the sense of chapter ii. To retain part of the firm's net receipts will be associated by management with a better potential exploitation of yet unknown, but possibly existing opportunities at

¹Of course, the legal position of stockholders is quite different from the legal position of labor because the stockholders as a group have a legal claim to the firm's market value at all times.

²The interpretation of dividends given here conflicts with the position of Franco Modigliani and Morton Zeman, "The Effect of the Availability of Funds, and the Terms Thereof on Business Investment," Conference on Research in Business Finance (New York: National Bureau of Economic Research, Inc., 1952), pp. 263-309. These authors state that "a payment of dividends can only be considered a cost if the payer and the payee are different persons, which obviously is not the case since the stockholders are the owners of the firm." *Ibid.*, p. 264. This conclusion may be correct if the ownership concept of the firm is employed. The payer of the dividends is the firm (*i.e.* the corporation), the payee is the collectivity of its stockholders. These may not be different persons but they certainly are different economic subjects. See also Penrose, Theory of Growth, p. 28, and Waino W. Suojanen, "Enterprise Theory and Corporate Balance Sheets," The Accounting Review, Vol. XXXIII (January, 1958), pp. 56-65, especially pp. 56-57, who also considers dividend payments as costs of the firm's activities.

moments beyond the expectational horizon. In order to analyze this maximization process, it is necessary to establish a theoretical analysis of the process of "retained-funds maximization." It is assumed first that management does not plan to issue any equity stock.

Each feasible course of conduct (a course of conduct securing the firm's continued existence) is associated with one net-receipts pattern resulting from the firm's activities. An amount of net receipts of N_0^t in period t will lead to an amount of funds available at the beginning of period $n + 1$ which is equal to $N_0^t (1 + r)^{n - t}$ if $100r$ is the interest rate expected to be earned on the retained funds put out on interest outside the firm.¹ The total amount of available funds at the end of period n associated with the net retained funds pattern $N_0^1, N_0^2, \dots, N_0^n$ is equal to $N_0^1 (1 + r)^{n - 1} + N_0^2 (1 + r)^{n - 2} + \dots + N_0^n$. Here, because of the continuity assumption, N_0^n can not properly be interpreted as the "expected net receipts" in period n , as was the case in the theory of profit maximization set forth in chapter ii. Under the continuity assumption, total future liquidation of the firm's non-monetary assets is not now contemplated. This does not alter the fact, however, that the expected exit market value of the firm's non-monetary assets at the end of period n must be considered a potential source of internally generated funds. It is correct to view N_0^n as an

¹Since net receipts in each period are defined net of dividends one can also speak of net-retained funds and expected net-retained funds patterns.

amount of money which could be used for investments in period n and beyond the expectational horizon. Apart from dividend considerations, N_0^n is equal to the last item in the stream of net receipts in the general profit-maximization model of chapter ii.

Selecting a course of action on the basis of the above summation will lead management to choose the alternative which maximizes the firm's total market value at the end of period n . This total market value consists of the exit market value of the firm's non-monetary assets, the net receipts in period n and other cash holdings.¹ At first sight a maximum total market value of the firm's assets at the end of period n can not be the ultimate criterion if the issue of stocks is contemplated in any one of the first n periods.

The firm's total subjective goodwill under the continuity assumption consists of G_0^0 and G_x . Profit maximization in the sense of chapter ii implies the maximization of G_0^0 . If the amount of extra goodwill is the same for any alternative plan carried out in the first n periods, it follows that profit maximization in the sense of chapter ii is the same as the maximization of the firm's total market value at the end of period n . This holds specifically if in both situations the firm's planned dividends are considered costs.² It may seem likely that the firm's extra goodwill is an increasing function of its total market value at the end of period n . This leads to a rather peculiar conclusion.

¹The sum of the first two items is equal to N_0^n .

²Another condition is that the set of feasible solutions of the maximization problem must be the same for both maximization alternatives. See below, ch. iv and ch. v.

Any action which increases $G_0^0 + G_X$,¹ increases the firm's long-run profit. If G_0^n (the firm's expected subjective goodwill at the end of n periods) is an increasing function of M_0^n (the firm's expected total market value at the end of n periods) it follows that any action which increases M_0^n , also increases G_0^n (and thus G_X). Now, if management plans to issue stocks in period n it obviously increases M_0^n (and thus G_0^n and G_X) without presumably impairing the value of G_0^0 . Thus, it seems that planning the issue of stocks in period n is always advantageous for the firm. Of course, it has to be realized that only a visualization of what might happen in the decision-making process is presented. The horizon shifts with the passage of time and thus managements will never actually realize the somewhat strange intentions they seem to have from a theoretical point of view. It must be admitted, however, that one can better speak of the firm's total subjective goodwill than its total market value at the end of n periods as the criterion in selecting the future course of conduct.²

Management will plan for higher dividends than those called for by the profit-maximization plan over n periods if the increase in G_X resulting from the rise of dividends exceeds the decrease in G_0^0 .³

¹As will be recalled, G_0^0 is the subjective goodwill of actions within the expectational horizon; G_X is the present value of long-run optimism and equal to $\frac{G_0^n}{(1+r)^n}$.

²The situation becomes slightly more complicated if management plans to make some "preparation costs" for a stock issue in the form of higher dividends in order to ensure its success. If the dividends thus planned are higher than those required by the profit-maximizing plan over n periods it is likely that G_0^0 decreases somewhat because the funds involved can not be reinvested. Of course, this effect can be overcompensated by the increase in G_X . See also below.

³This, of course, is the general criterion which can be applied for borrowing or the issue of stocks in any period between

Profit maximization over n periods is therefore not necessarily equivalent to profit maximization over an infinite number of periods. This result is not too surprising, although no use has been made of the existence of definite expectations beyond period n , but only of a general feeling of optimism which can be expressed as a positive G_0^n . The assumption that G_0^n is a monotonically increasing function of M_0^n is not entirely unrealistic. It could also be that management considers G_0^n dependent on its own ability in dealing with the future, rather than on the market value of the firm's assets at moment n . This consideration would make G_0^n constant for all alternative plans between periods 0 and n and would not, therefore, affect the choice of a plan.

The Pursuit of Long-run Profits:

The Available-funds Hypothesis¹

The general nature of the horizon was seen to imply that management does not clearly recognize all future opportunities. Yet, on the basis of past experience it believes, or expects definitely, that there will arise opportunities with the passage of time. In general, management wants to make the best possible use of all opportunities. It wants to put the firm in such a position that maximum use can be made of both the known and the unknown opportunities. To be able to do so with respect to the unknown opportunities will require additional investment outlays after period n . Funds can be

0 and n and, for that matter, for any action within the expectational horizon.

¹Long-run profit maximization refers to maximization over an infinite number of periods.

generated internally (planning for the retention of net receipts) or they can be attracted from outsiders (planning for short term loans or planning for the flotation of bonds or stocks).

Under the circumstances that have been described above, G_0^n is considered an increasing function of the amount of funds management has available at the end of n periods. This is called the available-funds hypothesis. Management would plan for a maximum amount of internally and externally available funds if G_0^0 were thought to be independent of the actions called for by such a plan. This, of course, can not possibly be the case in practice. Management will plan for the availability of an optimal amount of funds at the end of period n . Optimal available funds at the end of period n refers to the amount of funds which becomes available at the moment if $G_0^0 + G_x$ is maximized. It will be seen that this case is closely related to the one referred to in the previous section, where G_0^n was considered an increasing function of M_0^n . The present assumption seems to be more general although, admittedly, there is no empirical evidence to make a strong case for it. It might at any rate be appropriate to investigate the implications of the assumption somewhat more closely.

The availability of external funds depends to a great extent on the firm's dividend payments. In addition, the reputation of the firm as a "growth company" will be of considerable importance. On one hand, therefore, the distribution of dividends may be advantageous, on the other hand, the retention of "ex-post profits" will be favorable for the creation of a "growth image." Maximization of internally available funds at moment n implies the maximization of the firm's

subjective ex-ante profit or, what is the same, the maximization of M_0^n . If the two factors influencing the availability of external funds do not cancel, it follows that the maximization of profits over an infinite number of periods is not the same as the maximization of profits over n periods.

The basic assumption made in the present study is that management pursues continuity.¹ The criterion in selecting the best plan (involving a specific activity or a combination of activities) is the amount of profit which will eventually accrue to the firm in the opinion of management. Implicit in the best plan is a decision on how to use the net receipts associated with it. The discussion suggested that there exists an optimum between the distribution of the net receipts in the form of dividends and their retention within the firm in the first n periods. What this optimum looks like in general terms has not been formulated rigorously. Some reflection shows that the best plan may come close to the profit-maximizing plan over the first n periods. This is especially the case if management tries to create a "growth image."

Thus the firm's dividend policy, together with its policy of retaining profits, is a crucial element in the maximization of long-run profits. This argument rests on the assumption that G_0 depends on the total amount of funds management has available at the end of n periods.²

¹The continuity assumption is not new. However, usually references to the continuity idea are made in discussions on ex-post profit and in discussions related to the nature of managerial constraints. See below, ch. iv.

²This assumption leaves the possibility open that G_0 is also considered a function of managerial ability if the amount of "extra" subjective goodwill created hereby is constant for any plan.

The level of the firm's ex-ante dividends, relative to the level of its ex-ante retained profits, can, therefore, be explained in terms of management's efforts to maximize the firm's long-run profits via the availability of funds at moment n . One can conceive of a specifically planned dividend pattern during the first n periods which is associated with the selected net-receipts pattern. This dividend pattern tends to have the following characteristics: (1) it exceeds the minimum permissible¹ dividend payments, (2) it falls short of the maximum dividend payments attainable within that plan.² Evidence that dividend payments in practice have these two characteristics will tend to support the available-funds hypotheses.³ Below it will be shown that many writers on business behavior implicitly support this hypothesis.

¹Minimum permissible dividends are defined in ch. iv.

²Maximum dividend payments are attained if management plans to distribute the net receipts of the profit-maximizing plan in periods 1 through $n - 1$, and an amount of M_0^n in period n . Such a plan would imply the liquidation of the firm and is, therefore, inconsistent with the continuity assumption. Management will stay within the borderlines of liquidation.

³It was assumed in this section that management thinks the future availability of external funds to be dependent only on the discounted dividend payments and the accumulated retained funds. Management may think that the future supply of funds is also influenced by other factors as, for instance, the patterns of the streams of dividend payments and retained profit figures. One can also imagine that management considers stability over time of both dividend payments and retained earnings as an important factor in the attraction of future external funds. These considerations may lead to an increase in $G_0 + G_x$.

The Available-funds Hypothesis:

Previous Contributions

Writers discussing business financing are usually not concerned with maximization problems. Their discussions are highly descriptive and tend to deal with rather practical matters. The remarks made by Osborn illustrate the kind of support the above stated hypothesis finds with these authors. He states that there are competing uses for the "residual earnings" of a firm. The development of a satisfactory policy with respect to the disposition of these residual earnings, therefore, requires the "exercise of carefully considered business judgment." Unless its management is willing to forego growth, "a small enterprise with no outside sources of capital must reinvest substantially all its earnings." A large firm, like a utility, which normally depends partly on stock flotations in order to obtain the necessary funds, is "practically forced to pay out most of its stable but relatively modest earnings in regular cash dividends." Osborn notices further that "between these two extremes the alternatives must be weighed with discrimination because these decisions can have a far-reaching impact on the future position and financing of a business."¹ The last quotation clearly suggests awareness of the existence of an optimum dividend policy with respect to the firm's well-being in the future.

Osborn's remarks support the hypothesis that G_0^n is a function of the total amount of funds available for investment in period n . He (and others as well) does not deal explicitly with ex-ante dividends and ex-ante retained net receipts but with the decision as

¹Richards C. Osborn, Corporation Finance, (New York: Harper & Brothers, 1959), p. 460.

to how management should make use of its ex-post profit. Although ex-ante profits should not be confused with ex-post profit, this point does not make a fundamental difference in the present context. The author refers to a policy and, therefore, to ex-ante concepts, since policy implies more than a decision as to the present distribution of dividends in relation to the profits made.¹

Other authors have considered the corporate maximization process in a theoretical manner. Baumol and Penrose may be considered representative for this group. The sales-maximization hypothesis of Baumol does not imply unconstrained maximization of the firm's sales volume. He realizes the importance of the profit objective and even states that "it is quite true that there is some conflict between the firm's sales goal and its profit objectives."² He suggests a compromise which holds that the firm's objectives "can usefully be characterized, approximately, as sales maximization subject to a minimum profit constraint."³ Profits in his opinion should be "high enough to keep stockholders satisfied and contribute adequately to the financing of company growth."⁴ He tries to also explain the determination of the

¹Remarks on dividend policies which are similar or comparable to those made by Osborn are found in Floyd F. Burtchett and Clifford M. Hicks, Corporation Finance (rev. ed.; New York: Harper & Brothers Publishers, 1948), pp. 529-535; Henry E. Hoagland, Corporation Finance (3d ed.; New York: McGraw-Hill Book Company, Inc., 1947), pp. 570-583; Arthur Stone Dewing, The Financial Policy of Corporations, Vol. IV: Expansion (New York: The Ronald Press Company, 1920), pp. 168-169.

²Baumol, Business Behavior, p. 49.

³Ibid.

⁴Ibid., p. 50.

minimum profit level but, significantly, does not define a minimum profit level at all. Instead, he refers to an optimum dividend policy, thereby implicitly suggesting long-term profit maximization. This can be shown as follows.

Baumol states that "the firm which hopes to have more securities to sell in the future . . . must take this into consideration."¹ Yet, he observes that, ordinarily, profits are not paid out entirely to stockholders. He notes that "stockholder incomes consist, in part, of the appreciation of their share values, which is doubtlessly increased, to some extent, by the ploughing of profits back into the firm."² Baumol denies that the level of retained earnings can be adequately explained in terms of managerial care for the stockholders' best interests. According to him, the level of retained earnings must be explained in terms of the firm's long-run objectives. He continues as follows.³

Rational behavior would require that the firm determine its minimum profit level, its dividend payments and the magnitude of its retained earnings in a way which achieves a balance between its current financing needs and the effects of its dividend history on the availability of cash in the future in the form of demand for future issues of securities. For the higher the proportion of dividends to **retained earnings**, the scarcer, obviously, will the firm's current funds become, but the easier will it be to sell new stocks in the future to a market which has learnt that this company treats its stockholders well. An optimal plan must compromise between the firm's current and future financing objectives by choosing intermediate profit to retained earnings ratios.

¹Ibid., p. 51.

²Ibid.

³Ibid., pp. 52-53.

In this passage Baumol suggests an optimum combination of "current financing needs" and the availability of external funds in the future.¹ This proves the point that he does not consider a minimum but an optimum profit level.

It is apparent that the considerations of management with respect to the firm's subjective ex-ante profit in the theoretical model of Baumol are the same as under the assumption that management strives after maximum long-run profits. More specifically, Baumol's analysis is applicable to the theory of long-run profit maximization if the available-funds hypothesis holds. He even states that the problem can seemingly be handled "by insisting on a high level of profit to provide plentiful funds for both dividend payments and retention" but rejects this conclusion because it conflicts with the firm's prime objective, namely, sales maximization.²

Penrose, unlike Baumol, is very explicit about the importance of profit maximization. She holds that at least some dividends must be paid to maintain the reputation of the firm and its attractiveness to investors.³ On the other hand, management does not pay out maximum dividends as it wants to reinvest the firm's profits,⁴ which suggests that the firm's maximand is profit over an infinite number of periods. Penrose assumes indeed that the maximand is long-run profits.⁵ The

¹As far as the internal funds are concerned Baumol seems to deal with a decision which pertains to only the present period. He seems to suggest also that the firm's current financing needs are given. But the current financing needs (probably to be interpreted as the planned investments in the first period) are only given after the "best" plan has been selected.

²Baumol, Business Behavior, p. 53n.

³Penrose, Theory of Growth, P. 27.

⁴Ibid., p. 28.

⁵Ibid., p. 29.

argument set forth in the previous section with respect to the available-funds hypothesis is clearly implicit in the following statement.¹

We would expect a marked tendency for firms indefinitely to retain as much profit as possible for reinvestment in the firm; we would also expect that funds could not be profitably used would be invested instead of being used substantially to raise dividends, unless dividends were required to attract further equity capital. In other words, profits would be desired for the sake of the firm itself and in order to make more profit through expansion.

The last part of this quotation suggests that profits are maximized in order to make growth possible. Profits and growth are not likely to be maximized within the same model if the "long run" refers to anything short of infinity.² Since "the financial and investment decisions of firms are controlled by a desire to increase total long-run profits" it may be concluded that the promotion of growth according to Penrose is subordinate to profit maximization.³ She is aware of an optimum balance between the retention of profits and the planned distribution of dividends.

One more line of thought must be mentioned in connection with the long-run profit maximand. This is the inclusion of planning for flexibility in the decision-making process as set forth especially by Hart and Tintner. Flexibility can be defined in a number of ways. Usually, however, it is associated with the possibility of changing from one activity to another.⁴ Hart points out that in general

¹Ibid.

²Unless, of course, the value of a preference function dependent on profit and growth is supposed to be maximized. It follows from the context that this is not what Penrose has in mind.

³Penrose, Theory of Growth, p. 29.

⁴Hart, Anticipations, pp. 25-27.

"flexibility will raise the expectation of net receipts."¹ In chapter ii this sort of flexibility was supposed to be taken into account by management when it formulated the net-receipt patterns of the various possible alternatives. The discussions of flexibility usually imply that there are opportunities which are too shapeless to permit definite plans. In principle, therefore, the flexibility idea can be reconciled with the long-run profit maximand. No complete analysis is given here, in part because the application of certainty equivalents makes the explicit introduction of allowance for flexibility difficult.

Various writers have dealt in different ways with the problems discussed in this chapter. The analysis of these authors can be reconciled with the assumption that management tries to maximize long-run profit and that the firm's extra subjective goodwill is a function of future available funds. It would probably be an exaggeration to state that management derives all utility from the firm's ability to make long-run profits. After all, many economists have stressed the importance of factors like prestige and power as managerial motives. These problems will be dealt with in chapter v. First it is necessary to discuss the restrictions to which the managerial maximization process can be supposed to be subject.

¹Ibid., p. 59. This apparently refers to what in the present study has been called G_0^n . The statement implies that a certain amount of G_0 is given up in order to attain a higher G_0^n .

CHAPTER IV

EX-POST PROFITS AND MANAGERIAL RESTRICTIONS

UNDER CONTINUITY

Management does not have complete freedom to choose the future course of action for the firm. There exist constraints to which the managerial maximization process is subject. It is generally believed that, if the maximand over n periods is not profit but, say, growth, the maximization of this variable is subject to a minimum-profit constraint. Baumol's theory on this point has been discussed in the previous chapter, and as it turned out, his analysis of the minimum profit level is not quite satisfactory. It is argued below that profit constraints, if any, should be stated in terms of ex-ante versions of ex-post profit concepts. To develop this idea, it is necessary to review first some of the various ex-post profit concepts discussed so far in the economic literature.

In discussing ex-post profit a new concept is introduced, namely, the minimum goal of the firm, which is assumed to be the continuity of the firm. Although the probable existence of the minimum goal can be shown fairly easily, it is quite difficult to indicate its exact nature in real life. It will be suggested in the present chapter that management tries to secure the continuity of the firm by following policies which form a set of behavioral constraints on maximization.

Ex-post Profit: Its Nature and Determination

Several efforts have been made to determine the nature of ex-post profits, not only from the point of view of the distribution of income, but also from the point of view of the individual firm. This study is concerned primarily with the managerial significance of ex-post profit. Previous efforts to define ex-post profits from this point of view have especially been directed toward the definition of objective ex-post profits. However, only one purely objective profit concept has been suggested so far. This is the concept of current operating profit, developed in the United States by Edwards and Bell. It can be interpreted as an objectivization of another important notion, namely, distributable profit. The last concept has been developed mainly by Meij in The Netherlands and is subjective in nature.

Quasi Objective Ex-post Profit Concepts and Reported Profit

Quasi-objective profits are not truly objective but contain subjective elements.¹ Two, somewhat contradictory, features are characteristic for these profit concepts: (1) no reference whatsoever is made to the future, (2) the firm is supposed to continue its existence for an indefinite time to come. The first point, as it is stated, is not quite correct. For purposes of objective measurement, in any ex-post profit interpretation developed so far, profit is considered a residual, either between "revenue" and "costs", or by

¹A profit concept is called objective if the amount of profit relevant to this concept lends itself to computation or observation on the basis of verifiable data; profit concepts for which these conditions do not apply are called subjective.

subtracting the value of a particular variable at the beginning from the value at the end of the period considered, as these values ~~are derived~~ from the balance sheets at those moments.¹

Traditionally, both the determination of "costs" and the valuation of the balance sheet items imply an allowance for depreciation charges. Now, for a majority of durable investment goods it holds that "there is no uniquely determined method of allocating the costs . . . to successive operating periods during the good's lifetime"² It follows that: (1) depreciation involves estimation, rather than determination, (2) an implicit assumption must be made as to future depreciation charges.³ This means that some future events are implicit in this ex-post profit determination. However, in many cases depreciation of durable goods is performed in a routine manner once their lifetimes have been estimated, and it is assumed that this makes feature (1) applicable. For the sake of briefness the profit concepts referred to are from now on called objective ex-post profit concepts.

The two basic problems of objective ex-post profit determination can be stated as follows: (1) in terms of which variable must ex-post profit be expressed, (2) what value must that variable have attained at the end of a period before ex-post profit exists. With some unimportant exceptions, the second of these questions has traditionally

¹It is assumed that the same measuring technique is used for both balance sheets or, rather, that the method of valuation of the balance sheet items is the same at both moments.

²Lutz and Lutz, op. cit., p. 11. See also pp. 6-8.

³This assumes subjective allocation. Specifically, it does not assume allocation by market values. It is exactly because of this point that current operating profit of Edwards and Bell is different from the quasi-objective concepts. See below.

been answered by assuming that the relevant variable must have the same value at the end of the period as it had at its beginning.¹

There is, however, considerable disagreement about the nature of the relevant variable. The three most important positions are summarized below (financial operations are ignored for reasons of exposition).

The relevant variable in the accounting profit concept is the amount of owners' equity. A firm's accounting profit is equal to the amount of owners' equity at the end of a period minus the amount of owners' equity at the beginning of that period. Owners' equity is defined as the total money value of the firm's assets at a certain moment at original entry values minus its total debts at the same moment.² Accounting profit is the same as nominalistic profit.³

The relevant variable in the substantialistic profit concept is the firm's "iron stock" (a translation of the German term "eiserne Bestand"). The concept of the firm's iron stock has been introduced into economic literature by Schmalenbach.⁴ It is defined as the

¹Provided, however, that changes in its value are taken into account which are to be considered financial operations in the relevant period, like the attraction of additional funds and the distribution of dividends.

²Original entry values are equivalent to historic costs. The original entry value of an asset is the actual money outlay made to acquire the asset (including installation); the current entry value of an asset is the minimum money outlay which would now be necessary to acquire the asset. The exit value of an asset is the maximum amount of money that can be obtained in selling the asset (dismantling outlays being deducted). Entry and exit values can differ considerably. Cf. Edwards and Bell, op. cit., pp. 75-77.

³Refinements like the "lifo" valuation method are ignored.

⁴Schmalenbach, op. cit. This English edition is a translation of the 12th German edition which was published in 1955. The first edition was published as Grundlagen dynamischer Bilanzlehre in 1920. The translators use the term base stock rather than iron stock.

amount of physical goods necessary to produce or to distribute (in the case of trading firms) a predetermined quantity of final products.¹ Assets owned in addition to the iron stock give rise to profit; assets not owned but supposed to be a part of the iron stock give rise to losses; deviations from the iron stock are valued at entry values prevailing at the end of the period.² Their appearance implies speculation.³

The relevant variable in the deflationistic profit concept is the purchasing power of owners' equity. Deflationistic profit is thus equal to accounting profit deflated with the general price index. Deflationistics are also referred to as belonging to the price-level school.

The accounting period of profit determination has met with considerable opposition during the last few decades, especially in times of increasing prices. This is particularly true for German economists and accountants, who turned out an overwhelming number of articles and books during and after the inflation in that country following the first world war. This opposition has led to the substantialists' and the deflationists' profit concepts, which are primarily meant to provide the firm with a "safeguard" against inflation

¹The substantialists take the size of the iron stock for granted; usually it is supposed to be determined by past experience in times of constant prices.

²Schmalenbach is a quasi substantialist; he applies different valuation criteria for fixed assets and for stocks in trade. See Schmalenbach, op. cit., pp. 171-190. The inconsistency in his argument is pointed out by Meij, Leerboek, p. 254. A systematic treatment of substantialism is found in F. Schmidt, Die organische Bilanz im Rahmen der Wirtschaft (2nd rev. ed.; Leipzig: G. A. Gloeckner, 1922), the first edition of which was published in 1921, and in Erwin Geldmacher, Grundlagen und Technik der bilanzmaessigen Erfolgsrechnung (Berlin: Verlag von Julius Springer, 1923).

³Speculation is defined later.

or, more specifically, to avoid the distribution (including consumption on the part of the owners) of accounting profits caused by rising prices of those of the firm's assets which are not held for speculative reasons.¹

There is, however, yet another profit concept, namely, reported profit. This is the amount of money which management publishes as representing the firm's results over the last period. It is important not to confuse reported profit with pure accounting profit. With some incidental exceptions, the profit figure as it is calculated by accountants is supposed to represent nominalistic profit. Important deviations from "pure" nominalistic profit are caused by evaluation methods like "lifo," but these methods are ignored here. Accounting profit, strictly speaking, is neither ex post, nor objective. Its ambiguity was shown above to lie in the determination of annual depreciation charges. Management fixes the depreciation figures by estimating the lifetimes of the capital goods concerned and by establishing the method of allocating the charges over time. Empirical evidence shows that in determining accounting profit, management in many cases does not apply those data on expected lifetime and allocation over time, which in its opinion, yield a good approximation of the firm's accounting profit.

The manipulation of depreciation charges causes a deviation between the firm's accounting profit as seen by management, and the

¹Deflationism and substantialism are only the main trends. For a more detailed and comprehensive survey of the opposition in Germany against accounting profit see Walter le Coutre's article "Bilanz-theorien" in Handwoerterbuch der Betriebswirtschaft, ed. H. von Nicklisch (2nd ed.; Stuttgart: C. E. Poeschel, 1938-1939), columns 1053-1078.

profit figure which is reported to its shareholders and other interested parties. The practice of reserving a part of the firm's ~~surplus~~ to cope with catastrophies which management pretends to expect in the future is another possible source of deviation between the firm's accounting profit and its reported profit. Accounting profit, as it would have been determined if management had not purposively biased the data in order to arrive at a predetermined reported profit figure, thus becomes another subjective ex-post profit concept. To avoid confusion it will be called accounting profit throughout. Apart from the considerations discussed in connection with the "objectivity" of objective ex-post profit concepts, accounting profit is not necessarily subjective in nature. If this is the case it is identical to reported profit.

The Concept of the Minimum Goal

The issue in determining or estimating ex-post profit seems more fundamental than is usually realized. Every interpretation of ex-post profit discussed so far (except reported profit) amounts to the designation of a specific variable. The increase in the value of this variable over the previous period indicates the firm's ex-post profit figure. For a nominalistist this variable is owners' equity; for the substantialist and deflationist it is respectively the firm's total iron stock and the "real" value of owners' equity.

The firms for which the accounting-profit concept was developed were usually not supposed to have an indefinite lifetime. The substantialists, especially, have, in their attacks on the accountants'

profit determination, stressed the point that the continued existence of the firm should not be endangered by the way the profit figure is determined.¹ Somewhat paradoxically, this continuity idea is also accepted in the modern nominalistic accounting theory. The firm, for accountants, has an indefinite lifetime which is independent of the life of its owners or managers. This does not alter the fact, however, that in the accountants' interpretation the firm is still looked upon as an investment, represented by the owners' equity.² The substantialists, on the other hand, look upon the firm as a collection of fixed and liquid assets of a composition which is determined by the firm's production process. The deflationists see the firm as a basket of goods, the composition of which depends on the price index used in deflating the balance-sheet figures.

It follows that an outsider's definition of ex-post profit depends on his interpretation of the firm. Thus nominalism, substantialism and deflationism each imply a specific interpretation of the business firm as an economic subject.

Still another interpretation of the business firm is given by Meij in developing the concept of distributable profit. A complete and detailed discussion of this concept falls beyond the scope of

¹This report is usually assumed to be distributed in its entirety.

²Accounting profit still finds many defendants on practical grounds in professional circles. However, in Germany this profit concept was also supported by economists, as a group usually indicated as the nominalists. For the nominalistic point of view see Wilhelm Rieger, Einfuehrung in die Privatwirtschaftslehre (Nuernberg: Verlag der Hochschulbuchhandlung Kriecher & Co., 1928). For a nominalistic attack on substantialism and deflationism see Wilhelm Rieger, Ueber Geldwertschwankungen (Stuttgart: Verlag von W. Kohlhammer, 1938).

this study.¹ The following remarks may suffice. Distributable profit (in the terminology of the present study) can be defined as the amount of money which, in the opinion of management, can be distributed or, more generally, disposed of, without reducing the value of whatever variable represents itself as the relevant one to management.² That is, distributable profit is a subjective concept.

Each interpretation of the firm involves the designation of a relevant variable. A firm has been able to maintain its position during the past period if it has ~~succeeded~~ in maintaining the value of the relevant variable at its previous level. This can be interpreted in such a way that the theorists under discussion view the maintenance of the firm in terms of the relevant variable as a sort of minimum goal for management.³ These remarks are exclusively related to

¹The present analysis is concerned with the role of ex-post profit in decision making. Meij, like other theorists on ex-post profit, is mainly concerned with the problem of how to determine appropriate ex-post profit figures.

²The interpretation of distributable profit given here is somewhat broader than that given by Meij. He has suggested that the nature of the modern corporation might imply that management interprets the firm as an economic entity which does not exist for just its stockholders but, instead, for the three main groups of persons associated with the firm, that is, the stockholders, management and labor. However, for reasons of exposition he usually states his theory in terms of the maintenance of the firm's future sales volume deflated by an appropriate price index. Except for the works already cited reference can also be made to J. L. Meij, "Winstmarge en marginale winst: een confrontatie van hedendaagse sociaal-economische en bedrijfseconomische inzichten," *De Accountant* (November, 1949), pp. 3-20; *Idem*, "Worsteling om het winstbegrip," *Maandblad voor Accountancy en Bedrijfshuishoudkunde*, Vol. XXVI (April, 1952), pp. 130-140; *Idem*, "Enkele kanttekeningen over winstbepaling en winstbestemming," *Maandblad voor Accountancy en Bedrijfshuishoudkunde*, Vol. XXIX (October, 1955), pp. 378-389.

³It is possible that the firm's continuity is secured even if in some periods the minimum goal has not been attained. See also below.

outsiders' opinions. Two questions arise. In the first place, what, if any, is the minimum goal in the opinion of management itself? More specifically, the change in value of which variable over the last period determines the ex-post profit figure in the opinion of management?¹ In the second place, what is the role of objective ex-post profit in the process of decision making? These points are discussed in the context of profit constraints. It is necessary, however, to consider first the nature of some profit concepts introduced by Edwards and Bell.

Objective Ex-post Profit: Realizable Profit, Business Profit and Current Operating Profit

Edwards and Bell introduce two new objective ex-post profit concepts: (1) realizable profit, which is a concept derived from subjective ex-ante income; (2) business profit, which is a substitute for accounting profit and part of which is current operating profit. It is business profit, they think, which is the crucial concept in case the firm has an indefinite lifetime. Realizable profit is considered more appropriate for an analysis of decision making in the short run. Realizable profit is defined as the increase in the value of the firm's total assets over a certain period, the assets being valued at their exit market values at the end as well as at the beginning of the period. Ex-ante realizable profit is defined as the hypothetical dividend that could be paid out without impairing the total

¹It can already be noted that if there exists such a variable in the opinion of management, this variable will also be the subjective measure of size. If, for instance, management thinks in nominalistic terms, it will obviously think of growth as the increase in the value of owners' equity.

exit market value of the firm's assets (in the first period ex-ante realizable profit is thus equal to $M_0^1 - M_0^0$). Ex-post realizable profit is the actual change in the firm's exit market value over the last period (in the first period thus equal to $M_1^1 - M_0^0$). Subjective income and realizable profit are related via subjective goodwill in the ex-ante, ex-post and the unexpected versions.¹

Business profit is defined as the increase in the value of the firm's assets over a certain period, the assets being valued at current cost at both the end and at the beginning of the period. Current cost of an asset is defined as the total amount of money needed to replace the asset by an identical item. Realizable profit is based on exit values, business profit is based on entry values; both sorts of values are supposed to be given at the moment of valuation. Business profit (which is used only in the ex-post version) is composed of (1) current operating profit and (2) realizable cost savings. These concepts are respectively defined as (1) the excess during a period of the current value of output sold over the current cost of the related inputs and (2) the increase in the current cost (entry values) of assets while held by the firm during the fiscal period.² These two components have only one point in common, namely, both refer to the same period.

¹Edwards and Bell op. cit., pp. 44-54. The general relation is $V_j^1 = G_j^1 + M_j^1$ in all versions.

²The firm's business profit being defined as the value of its assets at the end of a period minus the value of its assets at the beginning of that period, this profit includes the increase in the current cost of assets while held by the firm during that period, which are also sold during that period. One could call these gains realized cost savings, but instead they must be supposed to be included in realizable cost savings. Otherwise the sum of the realizable cost savings and current operating profit would not give the correct figure for business profit. Cf. Edwards and Bell, op. cit., p. 115.

The differences between the components of business profit are more important. These components are related to (1) different activities; (2) different goods. The activities are: for current operating profit, operating activities; for realizable cost savings, holding activities. It must be realized that operating profit arises because of price differences on different markets at the same moment; realizable cost savings arise because of price differences on one and the same market at different moments.¹ It is concluded from the heterogeneity of its components that business profits as such is not an especially useful concept for theoretical analysis. This does not imply, of course, that components of business profit are also useless.

The increase in a specific variable over a period gives the amount of ex-post profit. The nature of this variable is usually determined *a priori* by a specific interpretation of the firm. The nature of this variable (previously called the relevant variable) is derived from this interpretation of the firm. It is interesting to note that this is not the case with realized profit, business profit and current operating profit. Edwards and Bell start from several cost concepts and afterwards derive the corresponding profit concepts. They do not mention the fact that a minimum goal is necessarily implicit in each corresponding set of concepts. Current cost being related to current operating profit, it follows that the minimum goal implicit in this set

¹Speculation will be recognized as a holding activity but not all holding activities can be referred to as speculation. Management can speculate in many different goods but most common, probably, is speculation in raw materials. Holding activities, on the other hand, imply all assets which are kept within the firm for any length of time. Most of these holding activities are not consciously aimed at taking advantage of price differences over time and, therefore, should not be considered speculative activities.

of concepts is the maintenance of the firm's physical assets as these existed at the beginning of the period (not an iron stock as is the case in the substantialistic theory). The minimum goal implicit in realizable cost savings is the maintenance of the total entry-market value of the firm's assets as it was at the last moment of valuation (not the original entry-market value as is the case in the nominalistic theory).

The approach of Edwards and Bell is quite different from the one of Meij. The former try to develop objective ex-post profit concepts which can be meaningful for either managerial decision making or for use by outsiders (government, economists and the like) while the latter has started from a specific interpretation of the firm and thus arrived at a profit concept which is subjective in nature and which implies prospective welfare determination. Since Edwards and Bell assume profit maximization on the part of management, this leads them to the realizable profit concept, $M_1^1 - M_0^0$. To develop this (objective) concept they applied the expression $V_1^1 - V_0^1$ in defining unexpected subjective ex-post income (profit in their terminology) which makes it possible to define unexpected realizable profit as $M_1^1 - M_0^1$. As was shown in chapter ii, applying $V_1^0 - V_0^0$ as the expression for unexpected subjective income makes it possible to isolate its objective component since $V_1^0 - V_0^0 = G_1^0 - G_0^0$ (because $M_1^0 = M_0^0$).

The relevance of the value of $M_1^1 - M_0^1$ for managerial decision making under profit maximization is obvious. The parameter of action is the magnitude of the subjective goodwill of the plans considered.

Under profit maximization the amount of subjective goodwill of any plan is dependent on future market values. The further importance of realizable and realized profit follows from the proposition that the maximization of expected excess realizable profit over n periods (where the latter concept is defined as the total expected discounted realizable profits during n periods with a correction factor for the amount of interest sacrificed by adopting any plan which implies the holding of assets) is equivalent with the maximization of the firm's subjective goodwill.¹ It can be concluded that the concepts of ex-ante and unexpected realizable profit are important for the analysis of profit maximization.

The role of the magnitude of $M_1^1 - M_0^0$ in the firm's decision-making process is probably also significant.² It would be helpful for analytical purposes (namely, for the analysis of profit maximization without a "continuity constraint") if it were possible to show that this figure is indicative of the value of $V_1^1 - V_0^0$ and, consequently, of the value of $G_1^1 - G_0^0$. Too little is known about the origin of expectations to make definite pronouncements on this matter. The importance of a positive ex-post realizable profit figure is that it indicates that management has succeeded in increasing the market value of its assets and thus has converted subjective goodwill into actual market values. This is the maximum knowledge which can be inferred from objective data; it may in addition lead to conjectures about the further actions of the firm under profit maximization

¹For a formal proof of this statement see Edwards and Bell, op. cit., pp. 66-69.

²There is reason to assume that Marschak was well aware of the significance of actual and expected market values in the theory of profit maximization. But his analysis on this point is far from clear. Cf. Marschak and Lederer, op. cit., pp. 15-19.

The limited applicability of the realizable profit concept in this ex-post version is recognized by Edwards and Bell. It is for this reason that they have developed the concept of business profit which shows little resemblance to realizable profit (which was derived from the subjective-value approach) but one component of which (namely, current operating profit) comes very close to distributable profit or the net residual in the theory of Meij. It must be realized that current cost is not exactly the same as the concept replacement value in the theory of Meij.¹ No effort is made here to reconcile current operating profit with Meij's distributable profit (which is not objectively determinable).

In the theory of Meij, realizable cost savings are not considered a profit component. This appears to follow from the minimum goal adopted in his theory. Edwards and Bell assert that holding assets over time is one of the ways in which management may anticipate profit. It would nevertheless seem useful to divide the realizable cost savings in two components: (1) those realizable cost savings which are incidental to the operating activities of the firm; (2) those realizable cost savings which are consciously pursued by management (speculative activities). This is necessary if an indefinite lifetime of the firm is assumed, which puts a constraint on profit-maximizing behavior, as will be shown below. Speculative activities are not characteristic for this kind of firm. Holding activities are, but as a whole they are not consciously aimed at profit maximization, being incidental to the pursuit of the firm's objectives.

¹Current cost refers to replacement with technically identical assets. Replacement value refers to replacement with assets, which,

Relating realizable profit to current operating profit Edwards and Bell arrive at basically the ~~same~~ conclusions as Meij arrives at in discussing the rationality of continuing the existence of the firm. That this must be so follows from the connection between the net residual of Meij with current operating profit, and the fact that realizable profit is based on exit market values. These exit market values are the basis for valuation according to Edwards and Bell, as well as Meij, if the continued existence of the firm is endangered by the irreplacibility of its products and/or its assets.¹ In comparing the two analyses two issues are important: (1) the fact that Edwards and Bell do not start from the firm's minimum goal but from a profit-maximization assumption (with no constraint), (2) that these authors are trying to develop measurable profit concepts, not a subjective profit concept. The two theories show a remarkable resemblance in their basic conclusions. A rigorous reconciliation is possible but beyond the scope of this study.²

in the opinion of management, render the same services for the attainment of the firm's minimum goal.

¹For the exposition of the arguments see Edwards and Bell, op. cit., pp. 97-109, and Meij, Leerboek, pp. 35-38.

²It might incidentally be noted that the interpretation of cost is in general determined by the firm's minimum goal. Accounting profit, for instance, is associated with the so-called historic cost calculation. Distributable profit in the interpretation of Meij is associated with replacement cost, where replacement implies the purchase of a means of production which, in the opinion of management, has the same significance for the maintenance of the firm as the item to be replaced. To pursue this point further would involve an inadmissible digression from the main argument. Basically, Meij's Leerboek is dedicated to an elaboration of the point made in this footnote.

Profit Constraints to Which Maximization Is Subject

There is no intention to discuss all the constraints to which the managerial maximization process can be subject. Some of these are quite familiar. In the first place one can think of constraints which in a formal model take the form of mathematical identities. They often follow from the particular definitions adopted in developing a theory or, more simply, they are obvious from a common-sense point of view. In the second place one can think of the initial conditions to which any managerial maximization process is obviously subject, like initial inventories, working capital at hand and so on. In this context one can also mention the demand and supply conditions as they are interpreted by the firm's decision makers.

None of these constraints presents major analytical difficulties from a general theoretical point of view. They are not discussed further; their exact contents are considered given. It merits some emphasis, though, that in analyzing actual decision making one should not look at the constraints as they present themselves to the investigator, but should try to find out how the various constraints are subjectively interpreted and introduced in the decision-making model by the firm's management.¹

The usual assumption about the firm's objective is profit maximization over n periods or over an infinite number of periods. Writers assuming profit maximization usually do not consider the possibility of the existence of profit constraints. It would indeed seem strange to do so. Those advocating the maximization of some

¹An excellent formal study of "non-behavioral" constraints is found in Modigliani and Cohen, op. cit., pp. 20-23 and 30-48.

variable which is not profit usually imply that at least some level of profit must be attained during the n periods in question. This was argued especially by Baumol.¹

It will be shown below that profit constraints exist no matter what the managerial maximand is. It is for this reason that the nature of the firm's profit constraints is discussed first. Essentially two questions must be answered: (1) which profit concepts are used in defining the constraints, (2) what are the levels of profit which, according to management, should be secured.

Accounting Profit and Reported Profit

To be able to maintain its existing freedom of action and its position within the firm, management must follow certain policy rules. Generally speaking, management will be careful not to behave toward any group in the society in such a way that retaliation on the part of this group would lead to its dismissal.² Institutionally, the strongest groups in this respect are the firm's shareholders and its creditors.³ Both groups have a direct financial interest in the actions of management. In pursuing its goals, therefore, management will be especially anxious to avoid the displeasure of these two groups.

¹Baumol, Business Behavior, pp. 50-53. See also Simon, loc. cit., p. 262.

²This points to the existence of personal continuity considerations on the part of management. This point is discussed more fully in ch. v. It is assumed here that management pursues the continuity of the firm and that management does not consider resignation in order to enter the service of a different firm.

³An obvious third group consists of the legal authorities. It is assumed, however, that all actions of management are legal. In special cases suppliers or customers may exercise a dominant influence.

Assume that management tries to maximize the long-run profits of the firm.¹ The firm's shareholders, on the other hand, are primarily interested in the return on their property, that is, dividends received and price increases of their stocks.² It is extremely difficult for the stockholders of a management-controlled corporation to evaluate the prospects of the firms in which they have a financial interest otherwise than by the information they obtain in the form of the periodical reports published by the managements of those firms. The information which leads to the formulation of management's expectations can generally not be made available to outsiders because it may stimulate competition and thus lower the firm's subjective goodwill. Besides, managers and stockholders may have a completely different outlook on the relative merits of various courses of conduct, which might jeopardize management's plans.

Whatever the cause of the phenomenon may be, it is reasonable to assert that in many cases the firm's financial reports constitute the most important basis for the formulation of the expectations of stockholders. Being essentially outsiders, the stockholders can not do much more than extrapolate data of past periods into the future and they may be inclined, therefore, to judge the firm's success in the future in terms of its apparent success over the last period or a relatively small number of past periods.³ Apparent success to out-

¹The following argument holds also if management tries to maximize any other variable over an infinite number of periods. In principle the argument holds even if management tries to maximize profit or some other variable over the expectational horizon. See also below, ch. v, where deviations from long-run profit maximization are discussed.

²Some stockholders may seek to gain control of a firm. This possibility is ignored.

³An important factor is the success of the firm relative to that of other firm's. It is assumed, however, that the success of all comparable firms is constant over time.

siders may parallel the firm's reported profit or some modification thereof, such as, for instance, some measure of the real value of reported profit, or even the part of reported profit that is paid out as dividends.¹

It is suggested here, and adopted as a reasonable assumption, that outsiders like the firm's stockholders and its creditors regard a non-negative ex-post profit figure (and thus an increase of the variable whose changes, in their opinion, denote ex-post profit), during each period or during a relatively small number of periods as a minimum level of acceptable achievement. A second basic assumption is that management is aware of the existence of such a standard of success.

Granting these assumptions, management must form an opinion of the concept of ex-post profit generally employed by relevant outsiders and arrange the firm's affairs in the short run to achieve at least this minimum acceptable level of ex-post profit. That is, management must form an opinion of the relevant variable employed by stockholders and creditors (and possibly other groups). The maintenance of the size of the firm measured in terms of this relevant variable is treated here as the minimum goal of the firm. In previous sections the minimum goal was discussed in terms of economists' opinions. Presently, the main concern is with the minimum goal which, although subjectively established, is imposed on management by outsiders.

¹It is also possible that outsiders regard the standard of success to depend upon not only a positive variant of reported profit, but also upon the disposition of such profits. Other factors which may be taken into account are reported profits per share or per dollar invested, sales per dollar invested and so on. Not all of these factors can possibly be discussed here, but their possible impact on managerial decision making can easily be reconciled with the discussions on financial constraints and the continuity constraint. See below.

The following general observations can be made. The expectations entertained by stockholders about future dividends may be supposed to be a function, among other things, of dividend payments in the past which, in many cases, constitute the most important objective basis for these expectations. Management can not afford, therefore, to refrain permanently from paying dividends. Such a policy would certainly antagonize some stockholders who would blame management for bad conduct.

To be able to pay dividends, management must have built up a surplus in the past or show a reported profit figure which is positive. It is assumed that the total dividends paid out in any fiscal period can not legally exceed the firm's total surplus at the end of that period. In practice, however, management will almost surely try to avoid subsequent decreases in this surplus because a repeatedly negative reported profit figure (before dividends) is bound to provoke intervention on the part of the firm's shareholders and creditors. This will eventually lead to either the liquidation of the firm or the dismissal of the managers. On these grounds it seems safe to conclude that management feels that the reported profit figure (before dividends) can not permanently be negative or zero.¹

In order to avoid undesired reactions, management can manipulate, at least within limits, the reported profit figure for any single period so that this profit figure becomes more favorable. But this can not be done permanently within the existing legal framework of many countries. In the long run, of course, reported profit must necessarily show some

¹It does not follow, however, that management thinks that reported profit should not be negative or zero in any one of the future periods considered.

correlation with the firm's accounting profit. It follows that management may feel that the firm's accounting profit, too, can not permanently be negative or zero. The reason for this feeling on the part of the firm's managers is their awareness that the maximization of any variable without such a profit constraint may imperil their own positions as managers or the very existence of the firm.¹

It follows from the preceding argument that management is forced to think of ex-post profit in terms of nominalistic profit. Legally, management is also forced to determine and publish nominalistic profit figures. Empirical evidence shows, however, that management does not find the nominalistic standards adequate to maintain the firm. Replacement does not always involve the purchase of assets which are technically identical to those worn out. Management is aware of this and, therefore, it can not be presumed to think of the firm as an "iron stock" of assets, either. It is also hard to believe that management will find the survival criterion in the real value of the investments made in the firm by outsiders.²

This raises the question of what outsiders (like the firm's stockholders or the government), in the opinion of management, should think of as ex-post profit. Because the publication of profit figures restricts the firm's decision makers in their freedom, it is not

¹Many corporations have the reputation of being "growth companies." Management will presumably want to preserve such a reputation. In that case the firm's reported profit after dividends must definitely not be negative over a significant number of periods. However, the reputation referred to will enable management to pay low dividends relative to reported profit.

²Although he is dealing with a somewhat different problem, for an extensive argumentation of these points see Meij, Leerboek, pp. 248-271, and, from the same author, Beschouwingen over aard en omvang van de winst ('s-Gravenhage: N.V. Uitgevers-maatschappij v/h G Delwel, 1948).

impossible that management changes its interpretation of ex-post profit if, for instance, a general price increase over some number of periods is followed by a general decline in prices. What management advocates to be "true" ex-post profit may depend on the consequences of various methods of measuring ex-post profit on tax liabilities and potential demands for wage increases.

The Levels of the Profit Constraints

Next the levels of the profit constraints must be discussed. In order not to evoke the suspicion of the firm's shareholders or creditors, management may plan to pay a certain minimum dividend in each future period considered in decision making. Legally, the total dividend payments in any period can not exceed the firm's surplus at the end of that period (including the reported profit of the last period). The minimum dividend considered necessary in future periods can probably be assumed to be constant per share. Ignoring planned issues of equity stock, it follows that the minimum total dividend to be paid out in the future is a constant amount (D) per period.

If it is assumed that management avoids decreases in the firm's surplus over one year, management must plan to report a profit figure in each of the n future periods that is at least equal to D. More generally, management may be expected to plan to report a profit figure (P_r) in any period t ($0 < t \leq n$), such that $P_{r,t} \geq s_t \cdot d$ where s is the average number of shares planned to be outstanding in period t and d is the (constant) minimum amount to be paid per share per period.¹ The value of d is probably largely determined by

¹As stated the constraint is very strong. However, the only intention is to show what the constraints might look like in a formal manner under rather rigid conditions. It will be obvious that most of the constraints leave more freedom to management than is suggested here.

the firm's payments in recent past periods. It can be assumed, for instance, that d is equal to dividends per share over the last period, provided that management did not distribute abnormally high dividends in that period as compared with earlier periods. In the case of dividend stabilization in the past, d can be supposed to be equal to the "traditional" pay-out per share.

It has been argued earlier that the firm's accounting profit can not be permanently lower than its reported profit. Unless management wants to conceal difficulties which it thinks it can overcome in the very near future, it is unlikely that a profit figure will be reported which is higher than the firm's accounting profit over that period (including non-reported accumulated accounting profit in past periods). If management does not allow the firm's ex-ante accounting profit (P_a) to be lower than its reported profit in any of the n periods within the expectational horizon, the constraint can be expressed as $P_{a,t} \geq P_{r,t}$ or $P_{a,t} \geq s_t \cdot d$. If allowance is made for the possibility that management can report a profit of $s_t \cdot d$ if $P_{a,t} \leq P_{r,t}$, the constraint can be expressed as $\sum_{i=0}^t P_{a,i} \geq \sum_{i=0}^t s_i \cdot d$, provided that all the past accounting profit has been reported by period 0. If the last condition does not hold, one arrives at the following constraint:

$$\sum_{i=-e}^t P_{a,i} \geq \sum_{i=-e}^t s_i \cdot d$$

where e stands for the age of the firm, expressed in fiscal periods.

The firm's accounting profit in any period is equal to the increase in owners' equity which was defined as the total value of the firm's assets (at original entry values) minus its total debts on the moment of valuation. Disregarding investments, the firm's ex-ante accounting

profit before dividend payments over any period t is equal to $P_{a,t} = E_t - E_{t-1}$ where E stands for the owners' equity. Of course, management must be prepared to pay larger total dividends after it has issued additional equity stock but this and other details are ignored here.

So far it may be concluded that management, if maximizing, say, growth or profits over n periods or an infinite number of periods, must impose at least some restrictions on the levels of the firm's accounting profit and its reported profit in the future periods in which it must determine and report a profit figure. The nature of these constraints is more or less institutionally determined because accounting profit and reported profit are essentially institutional concepts. The possible deviation between the firm's accounting profit and its reported profit in any period is of course determined by the specific policy considerations of management.¹

Subjective Ex-ante Profit

The question arises whether it is necessary to define a profit constraint in terms of the firm's subjective ex-ante profit or its subjective ex-ante income. It might be argued that one is logically compelled to do so, since decision making is necessarily related to the future. Instead, the constraints discussed so far have been defined in terms of ex-ante versions of essentially ex-post profit concepts. The argument was that management at the moment decisions

¹The length of the (fiscal) periods is also institutionally determined. This implies that within a fiscal period management is not constrained by either reported-profit or accounting-profit considerations. This is especially important if a planning period in the sense of Lindahl or Hicks is shorter than the fiscal period.

are made wants to ensure that at the end of certain periods (especially the n^{th} period) the firm's reported profit and its accounting profit have at least certain predetermined values. It can be shown that subjective ex-ante profit need not necessarily play an explicit role as a constraint.

The concepts related to the firm's decision making set forth in chapter ii (such as subjective value, subjective goodwill, ex-ante profit and ex-ante income) are meant only to analyze the process of managerial profit maximization. This does not mean that the same concepts can or should be applied for the more general type of decision making presently discussed.¹ In fact, it would be theoretically wrong to do so because management may try to maximize the firm's growth or its sales volume.

Another question is whether the constraints discussed so far are reconcilable with the notion of subjective ex-ante profit and income. Given the goals of the firm and the expectations entertained by management, the same values (either entry or exit) enter the estimates of all ex-ante concepts related to any specific course of action. For any specific plan, therefore, it is possible to reconcile the constraints with the subjective-income concept if adequate information (consisting of a periodical specification of the certainty equivalents of the firm's expected expenditures and receipts and knowledge of the discount rate) is available. However, this holds for only one single plan. It is impossible to give a general expression

¹This case refers to the maximization of any single decision variable over any number of periods except, of course, the maximization of profit.

of the defined profit constraints in terms of the firm's subjective value. It must be concluded, therefore, that no profit constraint need exist which is defined in terms of the firm's subjective ex-ante profit. Neither subjective ex-ante profit, nor subjective ex-ante income have to play an explicit role in decision making under the assumption of non-profit maximization.

Financial Constraints to Which Maximization
Is Subject

In addition to profit constraints the firm may face certain financial constraints. A firm's actual and potential creditors, as well as security analysts, who influence stock prices, show a keen interest in several so-called financial ratios. Many treatises on corporate financial policy deal extensively with these ratios, and some authors even give actual values as standards for financial management.¹

The establishment of such rigid standards has often been criticized on good grounds. Reference to the different financial environment of different firms in time as well as in space already indicates that the ratios can have little general validity. The discussion mostly centers around the question of whether firms should apply standard rules to their financial structure. As presented, the ratios usually have the quality of constraints which are internally imposed restrictions on decision making. Within the present assumptions

¹A few values are mentioned, but not supported by Osborn, op. cit., pp. 204-209. Changes in the ratios are considered important in Burtchett and Hicks, op. cit., pp. 490-508. One author is even reported to have established a "ratio weight table." Cf. Hoagland, op. cit., p. 486.

of this study and, for that matter, within the assumption of profit maximization in general, financial ratios can not be considered constraints in the sense indicated. They are clearly a function of the firm's behavior and not determinate for it.

It is more appropriate to relate financial ratios to the image of the firm management believes to be held by groups capable of influencing the firm's success. It is a fact that outsiders consider financial ratios important indicators of the future performance of management. The prospects of any firm which does not meet the various "tests" are viewed with reservation. This means that the "financial image" of a firm depends to some extent on the ratios which various groups think are indicative of managerial performance. There seems to be little doubt that management is aware of these standards and that it will take them into account in the formulation of plans which are expected to call for external financing. This holds entirely apart from what management itself considers ideal or optimal ratios for the achievement of its objective. The financial ratios to be applied in determining the financial structure are forced upon management by the environment within which it is operating.¹

It is possible, of course, that management considers the opinion of outsiders so valuable that it actually believes application of the ratios to be good practice. This, however, has the same effect, and in both cases the financial ratios, which are "given", must be interpreted as constraints on the maximization process. It is easily

¹At least one writer remarks that the importance of the opinion prevailing in the financial world for management is declining, the reason being the relatively increasing importance of internal financing. See Berle, op. cit., pp. 35-42.

seen that there is no difference in principle between the nature of the reported-profit constraint and the accounting-profit constraint on the one hand, and the financial constraints on the other hand. Management has to apply the externally set standards in order to preserve the images held by the actual potential suppliers of funds.

It was noted that the financial ratios can not generally be interpreted as subjectively imposed constraints on business behavior, existing apart from the influence of the images held by outsiders. If management is not aware of the nature of the images held, the ratios result from decision making and are, by definition, viewed as optimal. There is, however, a possible explanation for a departure from this rule. It may be that management routinely applies certain rules for financing the firm. The application of such rules may be based on the consideration that deviations below the customary standards lead to disaster. It may be expected, for instance, that in family-owned corporations the ratio between debt financing outside the family circle and total assets is closely watched. There are also considerable differences between industries in what is commonly looked upon as "sound policy." Such rules may stem from an "irrational" preoccupation with conventions. A more plausible explanation is that they are part of the overall objective of preservation of managerial control. This possibility is more fully explored in the following section.

The Continuity Constraint: A Suggested Interpretation

It seems clear that under the continuity assumption management does not maximize, say, growth over n periods without taking other than profit and financial considerations into account. Generally speaking,

one can say that management wants to avoid a deterioration of the image of the firm held by any group or institution in the society which, in the opinion of management, has the potential ability to intervene in decision making. It will also try to avoid a deterioration of the image held by any group which is potentially considered important for the success of management. Although usually presented in connection with an attempted repudiation of the profit-maximization assumption, numerous examples have been given in recent economic literature which support this statement.¹ Especially important in this context are the relations with government agencies, labor, customers and suppliers. One might perhaps also include the "relations" with the general public as they materialize, for instance, in the press. Under the assumptions made in this chapter, none of these factors can be an end in itself but in practice some of them may be included in the managerial preference function. In fact, most authors suggest including them in a sort of preference or utility function.

Although there can be little doubt about the legitimacy of introducing these factors into an analysis of plan formulation, there is still a question of whether they can or should be introduced as independent constraints. It was argued that the minimum goal constraint almost certainly imposes restrictions on managerial behavior. Yet under somewhat realistic conditions (changing technology, changing tastes, and changing relative prices, associated with uncertainty) it is hard to give it any explicit content in terms of quantities, prices or other "measurable" variables. The managers of

¹See, for instance, the literature cited in ch. iii in connection with the attempted repudiation of the profit-maximization assumption.

a firm which has experienced changing products, tastes and relative prices will not expect to produce the same quantities of the same physical products and to distribute them in the same fashion in the period n (and especially after period n) as it does at the present. Yet management wants the firm's continued existence to be warranted in period n .

However, management can have no more than a very vague idea of what must be done to secure the existence and the profitability of the firm in period n . It does not know, for instance, what the technical properties of the firm's products must be. But it knows, whatever changes take place, that the image of their product held by the customers (or the public in general) must at least be preserved. This image may be associated with the quality, the exclusiveness, or the low price of the firm's product. To achieve this objective it is likely that management thinks that certain outlays for advertisements and sales promotion are necessary. These minimum required outlays can be interpreted as a constraint on the maximization process. Similar constraints can exist for the suppliers' markets, including the labor market.

The constraints in terms of the firm's reported profit, its accounting profit and the financial ratios are basically of the same nature. The "policies" of many firms with respect to specific issues can also be interpreted as being aimed at the achievement of continuity. These policies act as constraints on decision making. The hypothesis submitted here is that a number of such constraints collectively take the place of the continuity constraint. In a

mathematical model these constraints have to be defined specifically, as was done above for the constraints in terms of accounting profit and reported profit; in practice management may try only to avoid deviations from established and accepted rules and policies. The existence of uncertainty in a changing environment makes it impossible for management to state the continuity constraint explicitly in simple terms. The substitution of a set of overall "policy constraints" may well be an accurate description of how management in practice tries to achieve the basic goal. It is a trial and error approach of which management hopes that it serves the purpose.¹

The fact that this is a trial and error approach makes it possible that there are constraints which are irrelevant from an objective point of view. This suggestion follows very clearly from a statement made by Jenny which is given below.²

If we take the budget of any one of the well-known large corporations, we find expenditure categories which--from the point of view of a narrowly defined profit motive--have not the slightest connection with the basic purpose of the enterprise. Yet, not only are they there, but many of them tend to be substantial. The mixture of rational, irrational and nonrational cost items is an expression of the firm's managerial ability and philosophy. With all its defects, it is the real-life organization's way of handling multivariate motivations, goals, and conflicts, faute-de-mieux as it were.

¹In practice management will also find it impossible to state the accounting-profit constraint and the reported-profit constraint explicitly. Both of these constraints may therefore be replaced by a "subset" of policy constraints, consisting of rules of the firm. An example is the establishment of a so-called pay-out period.

²Hans H. Jenny, "Operations Research: Its Nature and Scope, With Some Comments Concerning Its Impact on the Smoothing of Cyclical Fluctuations," Linear Programming and the Theory of the Firm, ed. Kenneth E. Boulding and W. Allen Spivey, op. cit., pp. 158-180, especially p. 272 (*italics in original*). Note that basic purpose stands for the maximand in the sense of the present study.

In the interpretation of the present study cost items as those referred to by Jenny will only occur as long as management considers them important for the achievement of continuity.¹ There can be a difference between the actual relations of each constraint with the basic goal and the way management interprets them.

Two assumptions are essential for the present analysis: (1) the existence of uncertainty, (2) the pursuit of continuity by management. Neither of these assumptions is overly restrictive. On the other hand, the assumption that the value of a single decision variable is maximized seems to be highly restrictive. Yet, little is known about the actual goals of business firms and it must be pointed out that, in spite of the admitted theoretical usefulness of utility functions, in practice there is no way of separating variables acting as constraints and variables actually subject to maximization. The interpretation of the maximization process given above may, therefore, be as relevant as an analysis based on multi-variable goals. There is no empirical evidence that most variables allegedly included in the preference function should not be conceived of as constraints. On these grounds the single-variable case is not so restrictive as it might seem to be. Even if allowance must be made for a multi-variable preference function it seems hardly probable that no constraints of the type indicated would exist. The analysis holds, therefore, for any ultimate objective.

No specific indication has been given so far of the exact nature of the variable which management may want to maximize. However, the

¹The same author refers to what he calls "social responsibility expenditures." Loc. cit., p. 173.

remarks made about behavioral constraints are relevant even if management pursues profit maximization within the expectational horizon. This result is important, since it follows that under the assumption of (subjective ex-ante) profit maximization it is plausible that profit constraints exist in terms of the firm's reported profit and its accounting profit.

Managerial Restrictions: Some Reconciliations

The interpretation of behavioral constraints given in this chapter can be reconciled with some existing theories. Penrose recognized the existence of several types of limitation on the growth of the individual firm. However, she states that the supply of managerial services provides a general limitation to the growth of any firm. At the same time the existence of unused managerial services is an incentive to expansion. This, in short, is the theory of the receding managerial limit. It may well be true that in some periods the supply of managerial services determines the maximum rate of growth possible for many firms. On the other hand, it is not correct to generalize this observation in the way Penrose does. It appears to be more general to state that the maximum rate of growth possible is determined by different factors at different times and under different circumstances.¹

Even if the constraint suggested by Penrose has general validity this does not make the behavioral constraints negligible. The Penrose

¹Especially the "fund-raising ingenuity" of management is overestimated by Penrose. See Penrose, Theory of Growth, pp. 37-39. There is little doubt that lack of funds is often a serious drawback for ambitious managements. See, for instance, J. Keith Butters and John Lintner, Effect of Federal Taxes on Growing Enterprises (Boston: Harvard University, 1945), passim.

constraint exists quite apart from the behavioral constraints and is more of the type discussed by Modigliani and Cohen, for instance. Behavioral constraints have a more general applicability than the Penrose constraint although, admittedly, the exact contents given to them differ from case to case. Below it will be seen that the set of constraints which was substituted for the basic-goal constraint is subject to changes on the part of management itself. This is a characteristic which distinguishes the continuity constraint from the constraints usually discussed in economic literature. It can be concluded, however, that the theory of Penrose as to the managerial restrictions does not in any way conflict with the suggestions of the present chapter.

The reconciliation with the theory of Boulding can also easily be established. It will be seen that homeostasis can be interpreted as the situation which results from the existence of several behavioral constraints. Especially the comparison of the homeostasis of the balance sheet with the remarks made here about the financial ratio's as behavioral constraints will make this point clear. In other words, the existence of a continuity constraint forms at least a partial explanation for the homeostasis as observed by Boulding. Changes in the homeostasis, therefore, must probably be explained by analyzing the causes of the changes in the contents of the behavioral constraints.

Changes in the Behavioral Constraints

The problem of managerial maximization as presented so far can be stated in general mathematical terms. There is a function to be maximized, subject to a number of constraints. Provided the problem

can be handled satisfactorily from a mathematical point of view, there are two possibilities in a specific case: (1) there exists a solution, (2) there does not exist a solution. Throughout the previous chapters the first possibility was assumed to hold. However, the second possibility may also be important from a practical point of view. Suppose that alternative (2) holds. This means that, in the opinion of management, no set of values can be assigned to the firm's decision variables which satisfies all constraints, which implies that no course of action can be found which guarantees the firm's continued existence for an indefinite time to come. It is, generally speaking, the behavioral constraints which restrict management to such an extent that no satisfactory course of action can be indicated.

The most natural thing for management to do, it seems, is to reconsider the constraints. Apart from the identities and the commonplace constraints, all restrictions to which the maximization process is subject are subjective interpretations of past, present and future events. It is necessary for management to find out whether its information and the interpretation of the past and the present is correct. It may be, for instance, that production functions are badly estimated, that the need for replacements is less than originally thought, and so on. If information is available at no cost, expanding the boundary of the set of non-behavioral constraints may lead to the possibility of finding feasible solutions. However, the condition of free information is not always fulfilled. Actual changes in the technical constraints, the market constraints and so on, even if considered desirable in principle, may be too expensive under the circumstances.

It is likely, therefore, that management will have to violate the existing behavioral constraints. Often when difficulties arise in practice management will reconsider its policy with respect to many issues. An austerity program may lead to satisfactory results by reducing several routine expenditures which are not considered determinate for the firm's future on closer examination. The possible consequence is that some constraints are eliminated, others relaxed. A drastic approach is to manipulate the profit constraints and the financial ratio constraints directly. Sometimes a reassuring speech of the firm's president at a stockholders' meeting may be considered sufficient to cut down on originally planned future dividend payments. In other cases, explicit agreements with creditors and shareholders are necessary.

Every effort on the part of management to modify the originally applied behavioral constraints if no feasible solution exists can be interpreted as a reorganization.¹ Indeed, reorganizations are usually meant to secure the continued existence of the firm. In the given interpretation this amounts to changing the constraints to which managerial behavior is subject in such a way that a decision on a future course of action can be made. Important is the change in attitude which management may assume towards the groups considered relevant for the firm's continued existence.

Over time, policies and behavioral rules can also change gradually because of changing ethical standards, customs and, especially,

¹The case of direct manipulation of the profit and financial-ratio constraints will be recognized as what is in principle part of a financial reorganization.

changes in the managerial group. Such changes are of a sociological and psychological nature and are not discussed here. They are likely to be less drastic than changes in behavioral constraints caused by reorganizations.

CHAPTER V

SUMMARY AND CONCLUSIONS, DEVIATIONS FROM LONG-RUN PROFIT MAXIMIZATION AND SOME HYPOTHESES

The theory contained in this study dealt especially with long-run profit maximization. This theory can be extended in two different ways. In the first place, it is possible that management wants to maximize profits over a number of periods short of infinity. In the second place, the managerial preference function may contain decision variables other than profit. The theory of managerial restrictions requires only minor modifications if those possibilities are recognized. The concept of behavioral constraints has general applicability.

In the first section of this chapter the main conclusions reached in previous chapters are summarized. In the second section the maximization of profits over a number of periods short of infinity is discussed, followed by a section on the nature of non-profit maximands. Finally some hypotheses are formulated which, in principle, can be tested statistically.

Summary and Main Conclusions of Previous Chapters

To analyze the problems of the corporate maximization process, it was assumed that managers want to maximize the utility they derive

from their association with a corporation.¹ However, to define the objectives of the firm in terms of a generalized personal or group preference function is almost meaningless because the conclusions are bound to imply mere tautologies.

One must attempt to specify the corporate preference function by identifying the variables whose magnitudes determine the satisfaction of the managers. The position taken in the previous chapters is that the managers' utility is a function of the firm's profits. This can be so for various reasons: (1) the manager wants to act in the best interests of the firm,² (2) the manager wants prestige and social standing and thinks these to be a monotonically increasing function of the firm's profit, (3) the manager's income is a function of the firm's profit. Motivation (1) leads to long-run profit maximization (that is, maximization of profit over an infinite number of periods).³ Motivations (2) and (3) lead to profit maximization over an as yet unknown number of periods, to be discussed the following section. The conclusion is that profit maximization can offer a plausible explanation for business behavior.

If managerial expectations are not single valued (as is probably the case under uncertainty) it is impossible to maximize "pure" profits. The fact that management faces probability distributions of future outcomes makes it likely that several moments of these probability

¹So far the managers were supposed to be associated with the same firm during their whole lifetime.

²That management wants to act in the best interests of the firm's stockholders is unlikely in the case of management-controlled corporations, but it may be a satisfactory explanation in the case of family-owned corporations.

³Management will also attempt to maximize long-run profits if long-run objectives are considered identical. This point is discussed more fully below.

distributions enter the preference function by means of which uncertain outcomes can be thought to be transformed into certainty equivalents.¹ The use of certainty equivalents makes it possible to construct a meaningful theory of profit maximization.

The theory of profit maximization involves an attempt to visualize managerial decision making if profits are maximized. Crucial concepts in this theory are the firm's subjective goodwill (the maximand) and the firm's exit market value. Profit maximization is aimed at the conversion of subjective goodwill into market values. Although especially suited for single-investment decisions, the theory is applicable to the analysis of the complex activities of going concerns.

Traditionally it is assumed that management attempts to maximize profits over the number of periods (n) which determines the expectational horizon. The end of the horizon is usually interpreted as the period in which the firm's subjective goodwill is expected to be zero. There are two objections to this interpretation. In the first place, management may expect with (subjective) certainty that the net-receipts pattern after period i ($i < n$) is such that the firm's subjective goodwill at moment i is zero. In that case it will plan to hold its assets in liquid form in the time lapse from period i to period n . In the second place, it is implausible to assume that management will expect to make zero profits in the far future if it has experienced positive profits during a significant number of periods in the past. The assumption referred to would be realistic if profits are expected to show a definite downward trend in the future. Such expectations may prevail if profits in the past have shown a downward trend.

¹These remarks hold also for any maximand other than profit.

The expectational horizon must be interpreted as the number of periods for which management thinks it can make definite plans. Expectations entertained about events beyond the horizon in this sense are shapeless. This does not mean that management expects to make zero profits in the far future. It may expect to find opportunities of which the nature can not be determined at the present. If management has experienced positive and relatively stable profits in the past it will probably expect to make positive profits for an indefinite time to come. This leads to the conclusion that there may exist subjective goodwill which is associated with shapeless expectations. Maximization of long-run profits implies the maximization of the sum of the subjective goodwill associated with definite expectations (entertained about events within the expectational horizon) and the subjective goodwill associated with shapeless expectations (entertained about events beyond the expectational horizon). The discounted value of the subjective goodwill associated with shapeless expectations expresses the present value of long-run optimism.

The question of what the subjective goodwill associated with shapeless expectations (called the firm's extra subjective goodwill) depends on can not be answered in a positive manner. It was shown that in two cases the maximization of the firm's long-run profits will be identical with the maximization of profits within the expectational horizon: (1) if the firm's extra subjective goodwill is a monotonically increasing function of the firm's expected exit market value at the end of n periods, (2) if the firm's extra subjective goodwill is independent of the activities within the expectational horizon.

The hypothesis was advanced that the amount of extra goodwill depends on the total amount of internal and external funds which management expects to be available at the end of the expectational horizon. This hypothesis finds considerable support in the existing literature dealing with the behavior of the individual firm. If the hypothesis is correct, it implies that profit maximization within the expectational horizon differs from long-run profit maximization as to the plan to be selected because an increase in the amount of extra subjective goodwill may be accompanied by a decrease in the amount of goodwill associated with events falling within the horizon. Dividends must be considered as costs of the firm's activities. Planned dividends will generally be higher than the minimum permissible dividends and lower than the maximum possible dividends within the expectational horizon.

Thus a theory of profit maximization can be constructed on the basis of the assumed relationship between profits and utility. The managerial preference function may contain other decision variables than profit. If it contains two or more variables, management applies an indifference system.

On the basis of empirical findings it is often believed that management attempts to maximize the value of a multi-variable preference function. It was shown that this interpretation need not be correct. Managerial concern about various issues and the magnitudes of several variables can also be explained by means of the continuity assumption. This assumption implies that management does not contemplate the future liquidation of the firm. Managers are aware that a corporate firm has in general an indefinite lifetime and they want to ensure

its continued existence. This is especially true when they do not expect ever to be associated with another firm and when the maximization process extends over an infinite number of periods. The survival of the firm is undoubtedly an important objective in the opinion of many managers.

The survival of the firm (continuity) is ensured by adopting several policies and procedures towards various groups in the firm's environment because management does not want to evoke the displeasure of any group which may be able to damage the position of the firm. These policies and procedures will in practice also stem from management's own conscience.¹ That is, non-pecumary objectives can be interpreted as constraints to which the maximization process is subject. As a set of policy rules they impose restrictions on the managerial maximization process. These policy rules are behavioral constraints which, together with the non-behavioral constraints (initial conditions, demand conditions, production functions, etc.), form the boundary within which the maximization process has to take place in order to ensure continuity. Financial restrictions are an excellent example of behavioral constraints. The conclusion is that the phenomenon of behavioral constraints can explain why empirical observers think multi-variable preference functions are characteristic of decision making in the modern corporate firm.

¹It is not unusual to distinguish between restrictions imposed on management by outsiders and self-imposed constraints. According to Berle it is not the public opinion which is presently the major force in the formulation of constraints but the conscience of the firm's directors and managers. Op cit., p. 41.

Profit constraints can also be interpreted as behavioral constraints. Obviously, there does not exist a constraint in terms of the firm's subjective ex-ante profit if long-run profits are maximized. It was shown, however, that even if profits are not maximized there need not necessarily exist such a constraint. Instead the constraints have to be stated in terms of ex-ante versions of the firm's accounting profit and its reported profit. In general the existence of these profit constraints will impose restrictions on the shape of the net-receipts pattern to be selected.

The last conclusion is important for two reasons. In the first place because it shows that ex-post profit concepts (although in ex-ante interpretations) and ex-ante profit can be brought together in one comprehensive theory of constrained profit maximization. In the second place because it shows that the concept of accounting profit plays a role in the managerial decision-making process in spite of the almost universal rejection of this concept by economists, accountants, and business managers themselves.

Economists have especially criticized the traditional methods of profit determination. It was shown that their efforts have been aimed at the designation of the firm's minimum goal. Several ex-post profit concepts have been introduced, each of which implies a different minimum goal. The analysis of the minimum goal of the firm is independent of the managerial maximand. This does not hold for the concept of subjective ex-post profit which is only relevant under profit maximization. Theoretically, the concept of distributable profit is useful, but for practical purposes one has to work with the notion of current operating profit.

Profit Maximization Short of Infinity

A manager tries to maximize the utility he derives from his association with the firm. In the previous chapters this utility was assumed to be a ~~monotonically~~ increasing function of the firm's long-run profits. The manager was viewed as a person acting in the best interests of the firm for which he works. This may not be an unrealistic picture of the modern corporate manager. However, the possibility can not be ruled out that the preference function of some managers conflicts with the pursuit of long-run profits. That is, the managers' interests may conflict with the firm's interest in long-run profit maximization.

Apart from the objective of maximizing profits in the best interests of the firm, management may want to pursue maximum profits in order to maximize its prestige or social standing or to maximize its income. In many cases the manager's income is function of the firm's profits. It seems obvious that a manager, if consciously acting in his own rather than the firm's interest, does not attempt to maximize profits over an infinite number of periods. The following question arises: over what number of periods are profits maximized if this is done for prestige or income purposes?

In order to answer this question a few more remarks must be made about the continuity idea. Management can fail to achieve its objectives for two different reasons: (1) because the firm must be liquidated, (2) because control of the firm is taken over by a newly appointed group of managers. In general, management will want to avoid both eventualities. The first possibility refers clearly to the continuity assumption as it was applied in previous chapters.

The second possibility refers to the sort of personal continuity assumption which was mentioned briefly in chapter iv. Both types of continuity will lead to the establishment of behavioral constraints.

Assume first that a manager does not expect to stay with the firm he is presently working for. In that case he may only take personal continuity considerations into account and may, in general, not care about the firm's viability after he has resigned. Some behavioral constraints exist, but they are as a whole far less restrictive than the constraints aimed at preventing the firm's liquidation in the long run. Such a manager may seek quick profits, possibly for income reasons. The number of periods over which maximization takes place can be relatively short, even shorter than the expectational horizon, and depends, among other things, on the results the manager thinks can be obtained by working for a different firm. This type of manager is probably not too common.

It seems more realistic to assume that a firm's top-managers think they will be associated with the same firm in the future. Do these managers want to maximize profit (for prestige or income purposes) over their own expected lifetime (or the time lapse they expect to be associated with the firm), or over any other number of periods? The number of periods over which maximization takes place is called the maximization horizon, to be distinguished from the expectational horizon. If a manager maximizes profit over his expected lifetime, it follows by definition that the expectational horizon is at least equal to the maximization horizon.

The first possibility seems to be the most plausible one. However, almost any manager will be concerned about what others (especially

his successors) think of him as a manager after he has resigned. If he has indeed been trying to maximize profit over his lifetime (or until he resigned) he may leave a bankrupt firm behind. This, if a manager wants to maximize profit in his own interest, without consciously trying to attain the best possible result in terms of the firm's interests, he will almost certainly do so over a number of periods which exceeds the number of periods he expects to be associated with the firm. The argument involves personal continuity considerations which are very much the ~~same~~ as those mentioned above and which are independent of the continuity of the firm.

It follows from the preceding argument that managers probably maximize profit for personal reasons over a number of periods which is short of infinity in the strict sense but which presumably exceeds the managers' expected lifetime. It is possible that the maximization horizon is shorter than the expectational horizon.¹

In the case of profit maximization short of infinity a conflict between the interests of the firm and the interests of the individual manager may arise. The manager maximizes the subjective goodwill associated with events expected to take place within the maximization horizon. No utility is derived from the subjective goodwill associated with events expected to take place beyond the maximization horizon. Therefore, the plan made up will probably differ from the one which maximizes the firm's profit over an infinite number of periods.

¹Of course, the age of the manager is an important factor in this context.

The shorter the maximization horizon, the lower the firm's subjective ex-ante profit **generally will be**. Other things being equal, for the same manager subjective ex-ante profit associated with a maximization horizon short of infinity can not exceed subjective ex-ante long-run profit. However, the subjective goodwill associated with events within the maximization horizon (which is shorter than or equal to the expectational horizon) is likely to be larger than in the long-run maximization case. This is so because there is no concern about the possible advantages in terms of the firm's long-run profit that can be taken from opportunities in future periods which are irrelevant for the manager.

These conclusions hold only if the set of constraints is the same in both maximization processes. This assumption is not realistic. The manager may not be concerned about the continued existence of the firm beyond the number of periods over which he wants to maximize profit. Yet he will have to maintain his position within the firm over this number of periods. It follows that he will take at least behavioral constraints into account, but these constraints will generally be less numerous and less rigid than they are under the pursuit of the continuity of the firm. This is so because some troubles can be allowed to arise immediately before the manager's anticipated moment of resignation. This will tend to increase the subjective goodwill associated with events **expected** to take place within the maximization horizon. It is even possible that the profits per period associated with the maximization horizon exceed the firm's maximum long-run profits per period.

In general a manager who wants to maximize profits over a relative small number of periods has little chance to pursue his

objectives if he is a member of a group of decision makers. The group will probably check the peculiarities in the motivation of any individual manager. One would expect the manager who can successfully pursue his own objectives to hold an autocratic position, say as a president of a company who also controls the board of directors.

The Nature of Non-profit Maximands

It was argued in chapter iii that management may want to maximize the long-run profits of the firm in order to promote the interests of the firm. Management may also feel that the long-run maximization of the firm's growth is in the best interest of the firm and, therefore, in the best interest of society. The question arises whether the recognition of this point changes the conclusions of chapter iii significantly.

In order to maximize long-run growth management will do best to maximize its long-run profits. The ability to make profit implies automatically an ability to invest and, thus, to grow. Management may be consciously aware of this. In that case it will act in accordance with the theory set forth by Penrose.¹ Growth and profit then become indeed identical objectives if applied to an infinite number of periods. The point is that if profits are maximized over the long run, management will automatically have a maximum control over resources in the long run. That is, whatever management wants to do in the long run regarding investments, it will always be advantageous to maximize profits over this time lapse since this

¹Penrose, Theory of Growth, pp. 29-30. See also above, ch. i.

provides the firm with a maximum of available investment funds. The available-funds hypothesis discussed in chapter iii is applicable in this case.¹

The identification of long-run growth and long-run profits may be caused by a conscious awareness on the part of management that the relationship holds from an objective point of view. It may also be that management identifies the two maximands on grounds indicated by Buchanan in the following way.²

The association of growth with increasing profitability may be so much a part of our historical experience that many business executives are still acting as if it ought to be realized in most enterprises. As a consequence they are perhaps prone to overestimate the probable net returns from further capital investment in their own concerns.

Buchanan's views merit some further discussion. He thinks that many businessmen are "habituated to the belief that the normal expectancy for most enterprises is growth and expansion accompanied by increasing profitability."³ He employs the hypothesis that management tries to maximize stockholders' returns. The position taken in the present study is that this is not very likely, a position

¹The question arises whether sales maximization in the long run must also be considered identical with long-run profit maximization. This point has been insufficiently explored by Baumol. He suggests that sales are also maximized over the "short run" but ignores the fact that short-run sales maximization can never explain the phenomenon of vertical integration. In that respect the sales-maximization hypothesis is unrealistic. As has also been pointed out by White, loc. cit., every action can be explained in terms of long-run profit maximization. Here the problem is in fact reduced to a tautology because one can say the same of long-run growth maximization and even long-run sales maximization. In short, any action can be explained in terms of any long-run maximand.

²Buchanan, "Dividend Distribution," P. 83.

³Ibid.

shared by Buchanan as far as real life is concerned. It must be realized, however, that the long-run maximization of profits is eventually in the best interest of the firm's stockholders from the managerial point of view. Buchanan considers only profit maximization over n periods and overlooks the implications of long-run maximization in the sense of chapter iii.

One might say that Buchanan wants management to reinvest the firm's net receipts only if it thinks that the stockholders can not do better themselves outside the firm. Theoretically this may lead to the distribution of dividends--even if management sees profitable opportunities for investment within the firm--if management thinks that the stockholders can do a better job themselves on outside investments. In fact, Buchanan's maximand corresponds to the profit concept which was defined as subjective ex-ante income minus "subjective" opportunity cost. The difference is that in chapter ii subjective opportunity cost referred to the opportunities of the firm's own activities as seen by its management, while Buchanan appears to refer to the opportunities which, in the opinion of management, exist for "outside" investments by the stockholders.¹

Subjective ex-ante profit in this study is defined as subjective ex-ante income minus "objective" opportunity cost.² Suppose, however

¹Cf. Buchanan, "Dividend Distribution," pp. 64-68. For his interpretation of outside investments see p. 66n. The author states rightly that in this case the corporation would take on the characteristics of an investment trust. Ibid. The distinction in investment opportunities suggested by Buchanan is basically the one between "operating activities" of the firm and "holding activities" on the part of the stockholders.

²The Buchanan concept, derived from his interpretation of the managerial maximand would be preferable if the implicit assumption that management acts consciously in the best interest of the stockholders over the expectational horizon were realistic. Buchanan himself admits it is not. Cf. "Dividend Distribution," pp. 81-82.

that subjective opportunity cost in the interpretation of Buchanan is equal to the firm's objective opportunity cost.¹ This reconciles profit maximization over the expectational horizon with his interpretation of the maximization of stockholders' returns and leads management to select the same alternative in both cases if maximization takes place over only n periods.²

There is another approach by which different long-run objectives can be reconciled. In chapter iv attention was paid to the maintenance of several internal ratios by management. This is the same as what Boulding means by homeostasis. If the homeostasis is complete, that is, if all variables must necessarily change proportionally in value, it follows that maximization of either variable will maximize all others. In other words, the fact that management wants to maintain a certain internal equilibrium may account for the fact that various possible long-run objectives are identical.

So far only attention has been paid to what management may want to attain in the long run in terms of non-profit maximands. Non-profit maximization over a **number** of periods short of infinity is usually associated with the pursuit of prestige or social standing. The general position among economists seems to be that prestige is very

¹This is explicitly suggested by Buchanan. Cf. "Dividend Distribution," p. 68, where he indicates that the market rate of interest determines the lowest "permissible" level of marginal subjective ex-ante income.

²The Buchanan assumption is also made (but not substantiated) by Modigliani and Zeman, loc. cit., p. 264. However, an explicitly defined "cut-off rate," is found in Merton H. Miller and Franco Modigliani, "Dividend Policy, Growth, and the Valuation of Shares," The Journal of Business, Vol. XXXIV (October, 1961), pp. 411-433, especially p. 418. Their interpretation of the maximization process is, therefore, comparable to the analysis of Buchanan and the one given in ch. ii.

closely associated with the growth of the firm. That is, prestige is supposed to be linked to the increase in size of the firm over time.

From the point of the firm a definition of growth is only relevant if management attaches importance to the size of the firm.¹ The problem of defining the growth maximand from the managerial point of view is somewhat complicated. The assumption is that management tries to maximize growth over n periods to increase its prestige. It is not impossible that the firm's size under this assumption is measured in several variables. These variables should have one point in common; management must think that their ex-post magnitude is observable for outsiders. Besides, only those variables will be associated with size which, according to management, are important for relevant outsiders in judging the firm's size and, consequently, the prestige of its managers. It follows that one has to look for what management thinks is the "size-image" of the firm in the circles it wants to impress.

Although a matter of considerable conjecture the value of two variables may be considered outstanding as measures of size in this context, namely, the firm's sales volume and the firm's physical production capacity. It is not unusual that managements point to the increase in the value of one of these variables in annual reports. Of course, in practice these reported increases can be incidental to the pursuit of other objectives like profit maximization and it may also be that management pursues profit as well as growth.²

¹If management wants to maximize profit exclusively, size is not a managerial objective. Generally, this does not mean that the firm's "size" is constant.

²The problem of selecting the size criteria applied by growth-promoting managers would not be as serious if it could be shown that all eligible variables are monotonically increasing functions of, say, the firm's capacity or the firm's sales volume. As Buchanan has pointed out, it is not impossible that management makes such an assumption, which implies identification of objectives over the maximization horizon.

The problems involved in short-run growth maximization are very akin to profit maximization over a number of periods short of infinity and they are, therefore, not further discussed.

Some Hypotheses and Suggestions for Future Research

Most of the results of the previous study can not be tested statistically. However, a few hypotheses can be formulated which, at least in principle, can be made subject to empirical verification. The available-funds hypothesis, developed in chapter iii, obviously does not belong in this category since it contains subjective elements. On the other hand, the implications of the relevant analysis can be tested rather easily with the use of balance-sheet data and data drawn from corporation reports. The following hypotheses follow immediately from the discussion of the maximization of long-run profit.

The more equity funds a firm on the average attracts from external sources, the higher will be its dividend payments relative to its retained profits. Implicit is the assumption that a firm which in the past relied to a significant extent on financing with additional equity funds attracted from outsiders, will continue to do so. Granting the assumptions underlying the available-funds hypothesis, a high correlation between the amount of equity funds on the average attracted from external sources with the average ratio of dividends and retained profits will tend to support the available-funds hypothesis. The relationship can also be formulated as follows. Firms presently paying the highest average dividends relative to their profits will attract the most external equity funds relative to their total assets value in the future. Equity funds are not

attracted each period in which dividends are paid. Therefore, average figures over at least five to ten years should be employed. A correlation analysis can be performed for individual firms.

Firms that are known as growth companies will pay relatively low dividends and retain most of their ex-post profits. This hypothesis is based on the argument that stockholders consider a relatively high profit retention by growing firms desirable and determinate for the future increase in value of their shares. It is somewhat difficult to identify growth companies. Newspaper information may be helpful; one can also measure ex-post growth in terms of the firm's total asset value as given on balance sheets. Significant correlation between the variables specified in the previous paragraph tends to support the thesis that management considers dividend payments determinate for the future success of stock flotations; significant correlation between the variables specified in the present paragraph tends to support the thesis that management considers stock price increases determinate for the future success of stock flotations.

Firms which finance mostly internally or by the flotation of bonds tend to pay relatively low but stable dividends per share. Dividend stabilization of this kind indicates the desire on the part of management to create an image of security (constraint considerations).

Ex-post profit data used in correlation analyses can only be obtained from published balance sheets. That is, one has to work with reported profit figures. It will be clear from the analysis of chapter iii that for an investigation of dividend policies these profit figures are satisfactory, even if they differ from actual

accounting profit figures and the magnitude of, say, current operating profit. Ex-post reported profit is a decision variable. As such it must be distinguished from the other ex-post profit concepts. However, to analyze other decision-making phenomena it is necessary to obtain data which give an indication of the ex-ante value of the firm's maximand. Under profit maximization, for instance, one must know what determines the firm's subjective ex-ante profit and thus its future investments and its future growth. The question of how ex-ante values are related to ex-post values is probably the most intricate one in the analysis of business behavior.

The most crucial variable in this context is subjective ex-post profit, the magnitude of which can not be measured. It is not impossible, however, that the firm's current operating profit can be assumed to take the place of subjective ex-post profit in the decision-making process. Profit maximization is aimed at the conversion of subjective goodwill into actual market values. Success under profit maximization can be measured as the increase in the firm's market value. These increases result from either holding activities or operating activities. It was argued that for most corporate firms (especially those engaged in manufacturing and distribution) operating activities play a dominant role. Thus price increases in the exit market values of the firm's non-monetary assets should be considered incidental to the maximization process. Of course, this point is closely related to continuity considerations.

Contemplating past results management will take replacement requirements into account. Therefore, apart from expected drastic

structural changes (tastes, technology) the firm's current operating profit in the past period will tend to measure the firm's success (subjective ex-post profit) quite satisfactorily, maybe even in the opinion of management. Data on current operating profit are not readily available, but measuring methods are suggested by Edwards and Bell in the second part of their book. The relation between reported profit and current operating profit can not in general be established. In the "long run" the two profit figures will show a high correlation, but this correlation is of a tautological nature. Although admittedly involving considerable conjectures, the following hypothesis is formulated, the implicit assumption being that current operating profit (called profit below) is determinate for the magnitude of the firm's expected profit.

Firms presently making profits which are higher than the average profits for the nation or the industry will grow at the highest rate in the near future. In making the correlation analysis various lags between the variables should be considered. A possibly high correlation should be interpreted very carefully. Under growth maximization, for instance, the same relation might hold. High past profits need then not lead to high profit expectations, but rather to expectations concerning the future availability of investment funds. In other words: different maximization processes can imply the same hypotheses, and a high correlation coefficient would not tend to support exclusively the profit-maximization assumption. The study suggests that statistical verification of the hypothesis should be performed on the micro level.

Apart from correlation analyses, other empirical evidence can be established as well. Extensive empirical research is desirable in order to determine the validity of many assumptions made in the previous analysis. However, some of these assumptions and conclusions derived therefrom can already at this stage lead to the formulation of hypotheses.

Most top-managers of corporations plan to stay with the same firm until retirement. It seems possible to verify this hypothesis by means of personal interviews or questionnaires. An affirmative answer to the question of whether managers think to be indefinitely associated with the same firm tends to support the continuity assumption and thus the existence of an extensive set of behavioral constraints.

Management changes its interpretation of "true" ex-post profits over time. Specifically, management changes its interpretation of what outsiders should think of as ex-post profits if the price trend changes from increasing to decreasing or vice versa. Also, different managements consider different ex-post profit concepts appropriate, according to whether the prices they are mostly concerned with (machinery, inventories) increase or decrease more or less than the general price index. Most managements probably prefer outsiders to think of profits as nominalistic ex-post profit deflated with some price index. The choice of such a price index (a general price index or a price index of specific commodities) depends on how management can best afford to report low profits.

Interviews together with an analysis of price movements would make it possible to verify the given hypotheses. A positive result would indicate that management does want to influence the interpretation

of the firm's results by those who hold claims on the firm's ex-post profit. In addition it would suggest that the maximization process is aimed at serving the best interests of the firm in the long run and that the requirement of reporting past results is considered a restriction on decision making. This follows immediately from the analysis of chapter iv.

A difficult point is how management in practice takes the various behavioral constraints into account. It is suggested here that a careful analysis of the procedures of investment planning would give at least some information on this matter. One thinks in this context especially of the establishment of pay-out periods for various investments, the level of investment outlays allowed on lower echelons of the organization and so on. It may be expected that more information about the profit constraints can also be made available through the observation of actual decision making in the past and in the present.

Case studies of individual firms seem appropriate for this purpose. For instance, the minutes of board meetings might be useful in establishing the nature of the variables considered relevant for attaining the firm's objectives. If there are multiple goals, it must also be possible in this way to make some distinction between behavioral rules acting as continuity constraints and objectives which actually enter the function which is to be maximized. Careful study of reorganizations and liquidations will also reveal valuable information on what management thinks must at least be attained in order to warrant further continuation of the firm's activities. It needs no comment that such a study would require a refinement and elaboration of the analysis of chapter iv.

It seems that historians and sociologists interested in business behavior might throw some more light on the question of managerial constraints than an economist could by just analyzing objective data. They might conceivably find out, for instance, how labor and stockholder relations restrict management and how the attitude of the general public is taken into account. Afterwards the economist could possibly state the restrictions in a more formal manner (that is, in terms of dividend payments per share, advertisement outlays, etc.) and interpret part of the firm's outlays as routine "constraint outlays." Such information would obviously enhance the possibility of forecasting business behavior. A few more hypotheses can be stated on the basis of the findings of chapter iv.

Corporations in which ownership and management are not separated will establish less frequently a pay-out period for investments than corporations which are management controlled. Also, payout periods, if established in ownership-controlled corporations, will tend to be longer than those established in management-controlled corporations. A positive result of an investigation on this point would give an indication of the existence of profit constraints and the rigidity of such constraints. Management controlled corporations are expected to apply the most **rigid** constraints.

Presently, hardly any information is available about the length of the expectational horizon, that is, the number of periods for which management thinks it can make more or less definite plans. There is no doubt that managers in several cases make tentative plans for a relatively large number of periods. An investigation might disclose more about the nature of long-run planning, the number of periods over which it extends, the definiteness of the plans, etc. Special attention

should also be given to the practice of budgeting. An analysis of budgets over a sufficient number of periods would give information about the firm's constraints as well as the correctness of managerial expectations. The revision of budgets implies characteristics concerning the causes and procedures of changes in plans.

The following hypothesis is also testable. Management-controlled corporations apply budgeting to a greater extent than ownership-controlled corporations. A positive result would indicate that management-controlled corporations tend to specify their objectives and plans in more detail than ownership-controlled corporations. It also lends support to the assumption that the former apply more rigid standards than the latter.

Thus it follows that hypotheses of a various nature can be formulated on the basis of the present study. No effort is made here to provide an exhaustive list of testable hypotheses that follow from the study. No effort has been made either to actually test them. Those given, however, can be tested with available data or with data that can in principle be obtained from **balance** sheets, corporation reports, interviews and questionnaires.

As was indicated in chapter i, the study can be made applicable to the analysis of phenomena in which business behavior plays a role. The study falls entirely within the domain of the theory of the firm and it could be of interest for, say, the analysis of macro-growth phenomena. It is also considered relevant for the theory of economic policy. This holds especially for those aspects thereof which are aimed at influencing business behavior.

On the other hand, it must be emphasized that the entire discussion is stated in very general terms. Several refinements are necessary, some of which suggest themselves. For instance, an analysis of the relations between accounting profit, reported profit and current operating profit would be desirable. Further investigation of the formulation of expectations and the translation of expectations into plans seems a *conditio sine qua non*. These extensions of the analysis should imply an indication of how the theoretical concepts are related to variables which can be measured. Thus it would be possible to formulate more hypotheses which might be used for forecasting business behavior. In spite of its preliminary nature it is nevertheless hoped that the study and its implications contribute to the further development of the economist's interests in the theory of the firm.

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