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A Thesis submitted for the

Degree of Doctor of Philosophy

GROWTH OF THE FIRM IN AUSTRALIA

by

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SUMMARY

This thesis is a study of the growth of the firm in relationship to the size, profitability, market structures and other economic attributes of the individual firm. The study is mainly based on an empirical analysis of 402 selected Australian public companies whose shares were listed on the Sydney Stock Exchange between 1950 and 1967. The firms were primarily engaged in various manufacturing activities during this 18 year period. The main sources of data for the study are the individual accounts obtained from the annual company reports. The growth of the firms is measured by the increase in net capital assets.

The aim, approach and the scope of the thesis are presented in the introductory chapter (Chapter I). The size and business activities of the 402 firms are first examined in the context of the market structures in which they primarily operate. Because these firms are listed public companies, they are mostly relatively large firms in the total company population. Despite this, however, we find that their relative position in each industry varies considerably from being the largest firm to being one of a number of similarly sized competitors. The market structures in which the 402 firms operate also vary considerably, from single firm monopolies downwards, and changes in concentration ratios are observed in many markets during the 18 years studied.

Having acquired background knowledge of the firms, their profitability and growth are examined in relation to their absolute size. Questions are asked whether larger firms grew faster than smaller firms; and what determined the firms' profitability and growth. The problems of mergers and entry of new firms into industries, and the association between profitability and growth of the firms are also examined. In brief we find that there are wide differences in the rates of profit and growth between individual firms and we suggest that this is largely explained by the differences in management - differences in managerial quality, skill and motivations. The threads of our thesis concerning the importance of

management in determining the profitability and growth of individual firms are drawn together in the last chapter where the observations and discoveries made in previous chapters are presented in an integrated form.

This Thesis has not been submitted for a higher degree at any other university; to the best of my knowledge and belief, this Thesis contains no material previously published or written by any other person, except where due reference is made in the text of the Thesis.

Signed

Kyoko Sheridan

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CHAPTER I

INTRODUCTION

SECTION I: The Problem

The theory of the firm has long been the source of controversy among economists. This is because, apart from the necessity to construct a general theory which explains the business behavior of firms of various types, the analysis of the growth of the firm has an important bearing upon a number of related branches of economic theory. For example, an explanation of investment decisions of the firm is required in order to examine the capital formation processes of both individual industries and of the economy as a whole; an explanation of changes in investment and output policy of firms in response to changes in market demand offers an important guide to policy makers concerned with price and output levels; examination of factors which determine investment and the introduction of new technology by firms is also extremely important in explaining the development and industrialization of an economy.

At the risk of some distortion arising from the brevity of our treatment we may summarize the development of the theory of the firm as follows.(1) Generally speaking, the earliest theory assumed that competition was perfect and asserted that the object of the firm was to maximize net revenue under given factor and market prices and production technology.(2) The theory was later extended by the introduction of imperfect market conditions and various types of theories of monopolistic competition and oligopolistic competition were suggested. The oligopolistic theory, however, led some economists to focus attention on the 'inter-dependence' of firms and thus to introduce 'indeterminate factors' into the input, output and investment decisions of a firm. However, many students considered that these market revisions left the fundamental weakness of traditional theory unaltered and several attempts

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(1) For an extensive review, see R.M. Cyert and J.G. March, A Behavioral Theory of the Firm (New Jersey: Prentice-Hall, 1963), pp.4-16.

(2) For a precise summary of traditional firm theory, see, for example, J.M. Henderson and R.E. Quandt, Microeconomic Theory (New York: McGraw Hill, 1958), Chapter III, and P.A. Samuelson, Foundation of Economic Analysis (Cambridge, Mass.: Harvard Univ. Press, 1947), Chapter IV.

have been made to completely re-construct the theory of the firm. One group of economists re-examined the motivation of the firm.

A. Papandreau, for example, suggests that organizational goals grow out of motivational interactions among the firms' personnel and that the 'general preference function' is produced in this way.(1) W.J. Baumol, on the other hand, suggests that firms try to maximize sales with a secured minimum profit constraint.(2) Alternatively, H.A. Simon suggests that firms seek only 'satisfactory profits' evaluated on the basis of alternative policies of the firm.(3)

A second group of economists suggest that the theory of the firm is primarily a theory of markets which explains only the general level of resource allocation by the price system. They stress the importance of the internal allocation of the firm's resources and the process whereby its prices and output are set and its investment policy is decided, and they attempt to construct a new theory of the firm based on the analysis of the firm's decision-making behavior.(4)

Another method of re-constructing the theory of the firm has been suggested by E. Penrose, J. Downie and later by R.L. Marris.(5) Based essentially on the assumption that the management wishes to maximize the growth of the firm, these writers attempt to answer the question: 'What limits the size of firms?', and to explain the growth of firms in the light of differences in decisions made by different managements.

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(1) A. Papandreau, 'Some Basic Problems in the Theory of the Firm', B.F. Haley (ed.) A Survey of Contemporary Economics (Homewood Ill., R.D. Irwin, 1952), Vol.2, pp.183-219.

(2) W.J. Baumol, Business Behavior, Value and Growth (New York: Harcourt Brace and World, 1966) revised edition.

(3) H.A.Simon, 'A Behavioral Model of Rational Choice', Quarterly Journal of Economics, Vol.69, (Feb., 1955) pp.99-118.

(4) See, for example, Cyert and March, op.cit.

(5) E. Penrose, The Theory of the Growth of the Firm (Oxford: Basil Blackwell, 1958), J. Downie, The Competitive Process (London: Gerald Duckworth, 1958), and R.L. Marris, The Economic Theory of 'Managerial' Capitalism', (London: Mcmillan, 1966).

In our study we are also primarily concerned with the differences in management - differences in quality, motivations and attitudes - in searching for an explanation of the different growth behavior of individual firms. We begin, however, with a traditional approach and examine the concept of optimum size of firms and economies of scale - the conceivable advantages and disadvantages, if any, of firms being a particular size.

Originally, economists generally used the term 'optimal' size as a synonym for 'least cost' size and, assuming perfect competition, the 'most profitable' size. Thus all profit maximizing firms should grow until they reach such an 'optimal' size. However profitability - or profit maximization - may not be the sole motive of businessmen. For example Penrose and Marris suggest that managements' energies are primarily directed towards ensuring faster growth of their firms and higher profits are aimed at only as a means towards this end.(1) Indeed, if this argument is accepted in its entirety then the whole concept of 'optimal' size may be discarded. Thus in order to explain how and why firms reach a particular size, and how and why firms move continuously from one size to another, attention should be directed not only towards the profit motive but also towards other conceivable aims which firms may pursue.

Economic theory is a product of the economic environment. As the environment changes the theory will be accordingly revised. Thus the concept of a 'firm' has changed considerably since Marshall's time.(2) Today we do not refer only to a small firm engaged in manufacturing a single product, or a set of closely related products, and selling in a competitive market. Such firms still exist and their contribution to market supply is certainly not insignificant in some sectors of manufacturing industry but as 'price takers' they have little influence over their business environment. Nowadays we are more interested in the role played by large firms in manufacturing industry and in the economy as

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(1) Penrose, op.cit. and Marris, op.cit.

(2) The differences between modern corporations and firms studied in neo-classical theory of firms are most extensively discussed by Penrose, op.cit., Chapter II.

a whole. These large firms do not confine their activities to one industry or even one economy. Rather, as profitable opportunities arise, they expand into a number of fields often outside manufacturing altogether and they build up considerable powers within their markets and even within the economy. Hence through their large size, both in relative and absolute terms, they are able to exert considerable influence over their business environments by manipulating consumers' tastes, the selling prices of their products and the buying prices of their materials, etc. In turn, their controlling power allows them to undertake long-run planning of their future investment. In this context we should note the important contribution of managers and entrepreneurs. As soon as we deviate from the neo-classical world of small-sized firms and perfect competition, the vital role of management and entrepreneurs in the business behavior of a firm become apparent.(1)

The recognition of the importance of managerial and entrepreneurial functions in the expansion of firms has led several economists to attempt to incorporate the contribution of managerial services into the 'theory of the firm' or the 'theory of the growth of the firm'. They include Penrose and Marris, Baumol, H. Leibenstein and a group of organization theorists such as Cyert and March.(2) Our study is oriented in a similar direction to these writers and we seek an explanation for the growth behavior of individual firms in differences

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(1) Several economists have noted that the importance of entrepreneurial activities and managerial functions arises when market structure differs from the perfectly competitive state. In monopolistic and oligopolistic markets the constraints imposed by market forces are expected to be loose and the scope for managerial choice to be considerable. See W.J. Baumol 'Entrepreneurship in Economic Theory', and H. Leibenstein, 'Entrepreneurship and Development', American Economic Review, Papers and Proceedings, Vol. 58, (May 1968), pp.64-71, and 72-83, and C. Kaysen, 'The Corporation: How Much Power? What Scope?' in E.S. Mason (ed.) 'The Corporation in Modern Society, (Cambridge, Mass.: Harvard Univ. Press, 1960).

(2) Penrose, op.cit., Marris, op.cit., Baumol, op.cit., and 'On the Theory of Expansion of the Firm', American Economic Review, Vol.52, (Dec. 1962) pp.1078-87, Leibenstein, op.cit., and 'Allocative Efficiency vs. "X-Efficiency"', American Economic Review, Vol.56, (June 1966) pp.392-415, Cyert and March, op.cit. and O.E. Williamson, 'Managerial Discretion and Business Behavior', American Economic Review, Vol.53, (Dec.1963) pp.1032-57.

between the quality, motivations and attitudes of management. However, the method of approach to the problem and the focus and the content of our study are different from those of any previous researchers.

SECTION II: The Approach

We attempt to examine in the following pages the relationship between the size, the profitability, and growth of manufacturing firms in post-war Australia with special reference to the market structure within which these firms operate. The growth of firms is examined in its relationship to the firms' initial sizes (measured by net capital assets), profitability, the extent of the fluctuations in the rates of profit, and the firms' monopoly powers. It is essential to analyse the growth and the profitability of firms in the framework of market structures. The type of market structure in which firms are engaged is one of the most important factors influencing firms' decisions on investment and expansion. Several writers have studied the conceivable effects of market structure on an industry's profitability and the variability of profit rate, its rate of technical progress, and the growth of production.(1) But much remains to be done in the application of the knowledge obtained from the study of industrial organization to the analysis of the growth of firms. By a careful examination of the impact of industrial concentration on the growth and profitability of firms we hope to provide some valuable new insights.

Our study which is based on empirical research will indicate that there are wide differences between individual firms in growth, profitability and other aspects of business performance. We will seek the causes of these observed differences by first examining the differences in size of firms and secondly the structures of the markets in which they operate. We will find that these factors appear to provide only a partial explanation and this indicates the importance of differences

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(1) See for example, J.S. Bain, 'Relation of Profit Rate to Industry Concentration: American Manufacturing, 1936-40', Quarterly Journal of Economics, Vol.65 (Nov. 1951), pp.293-324, and E. Mansfield, 'Size of Firm, Market Structure, and Innovation', Journal of Political Economy, Vol.71, (Dec. 1963), pp.556-76.

in managerial quality as a cause of the varying business behavior and performance of firms.

Concerning managerial and entrepreneurial functions, our attention will not be confined only to their role in the expansion of firms per se, but also, or rather in particular, to identifying and tracing the changing natures and goals of managerial personnel as their firms grow larger.

Our basic statistical information is confined to selected Australian manufacturing industries for the period between 1950 and 1967. The industries and the period are chosen in order to obtain maximum comprehensiveness of statistical data. Four hundred and two public companies listed in the Sydney Stock Exchange in the period were examined. The quality of the statistics and their sources is described in Appendices B-E.

Because of the nature of our basic data some of the hypotheses obtained may be applicable only to the Australian setting in the specific period considered. Nevertheless we are sure that much else of a more general nature can be learned from our study and it will serve, at least, as a useful aid to the formation of new hypothetical relationships between empirical observations on the size and the growth of firms.

Our analysis and results are presented in five chapters. In Chapter II we examine the market structure of the selected manufacturing industries and the changes in business concentration of these industries in the period between 1950 and 1967. We then classify the 402 firms in our sample according to the structure of the market in which they primarily operate. Next we measure the size of the 402 firms in terms of the value of net capital assets, and changes in their size distribution within eight major industrial groups and within the economy as a whole is examined at three different dates, 1950, 1958 and 1967.

In Chapter III the profitability of the firms is examined in relation to their size and the degree of business concentration of the

industry in which they operate. The 18 years are divided into three sub-periods and profitability of the firms is examined not only on the basis of the annual rate of return on net capital employed but also in terms of the association between profitability in one sub-period and the next. The various measures of profitability of firms are discussed in the Appendix to the chapter.

In Chapter IV we examine the association between the growth of firms, their size, and market structures and also the relationship between growth rates in one sub-period and the next. Problems of mergers and entry of new firms into a market are also discussed in the light of differences in size, differences in the stages reached in the firms' growth processes, and the difficulties arising from the expansion of managerial functions as the firms grow.

In Chapter V, the analysis of profitability and growth is brought together and the relationship between the two is examined in order to offer an explanation for the growth of the firms.

In Chapter VI, we tentatively offer a theoretical explanation of the growth of firms based on the observations and discussions obtained in the preceding chapters. The role of management is particularly stressed.

SECTION III: The Data

A detailed description of the method by which the basic data were collected, and their nature and coverage is given in Appendices B-E at the end of the study. But for the convenience of the reader a brief explanation is given below.

A. Period

The period studied is the 18 financial years from 1950 to 1967. The period is divided into three sub-periods, 1950-55, 1956-61 and 1962-67 inclusive. The division is based on changes in the general economic environment in which our firms operate. The years 1950-55 constitute a period still influenced by the effects of the post World War II expansion

and subject to abnormal fluctuations arising from the Korean War. In the second sub-period the economy resumed what may be termed relatively 'normal' peacetime operation although import restriction measures had been imposed on manufacturing products. In early 1960 import licensing was almost completely removed and the third sub-period witnessed much more competition from overseas manufacturers.

B. Industries

'109' industries:

Our study of business concentration in Chapter II concerns 109 manufacturing industries in Australia in 1962. The classification of these industries is designed to serve best our present purpose and further explanation may be found in Chapter II below. In terms of numbers employed the 109 industries represent about 64 per cent of all manufacturing industries (excluding 'heat, light and power') in 1962.

'51' industries:

For the study of growth and profitability of our 402 firms between 1950 and 1967, we excluded 39 industries from the original total of 109. Those excluded are industries in which:-

i) no public listed companies operated for more than six years during the 18 year period studied,

ii) the activities of most of the firms engaged are too widely diversified for accurate classification of their main activity (see Appendix D),

iii) either firms do not provide balance sheet data on a consolidated basis or the reported balance sheet figures are not sufficiently detailed.

Of the remaining 70 industries 30 are integrated into 11 larger industrial groups consisting of six groups in each of which two original industries are integrated, three groups in each of which three original industries are integrated, one group in which four original industries are integrated and one group in which five original industries are integrated. The groupings were determined by the fact that the firms involved were

practically all engaged in two or more related fields - for example the knitted underwear, knitted outerwear and hosiery industries are integrated into one large industrial group because firms engaged in one of the three industries are nearly all engaged in the remaining industries as well.(1)

As a result we are left with 51 newly classified industries in which to study the profitability and growth of firms. They represent 52 per cent of manufacturing industry in terms of number employed in 1962.

C. The firms

Our study concerns 402 public companies listed in the Sydney Stock Exchange some time during the period between 1950 and 1967 and their major activities lie in our '51' industries.

These 402 firms are classified into three categories.

i) 146 'Continuous firms' which operated continuously all through the 18 years studied,

ii) 68 'Discontinued firms' which operated as independent concerns in 1950 but were acquired by other firms (both inside and outside our sample) sometime before 1967. There are also 45 firms which entered our sample after 1950 by obtaining public listing in the Sydney Stock Exchange after that date but which were taken over before 1967. We may refer to the latter group of firms independently as 'Short-lived firms' but they are included in the 'Discontinued' group for most purposes.

iii) 143 'Newly entered firms' which were first listed in the Sydney Stock Exchange after 1950 and were still in operation in 1967.

D. Valuation

Value of assets (total employed capital and net assets) and net income (before and after tax) are the book values reported in the balance

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(1) This does not necessarily mean that all or even the majority of the producers are manufacturing these three products. There are numbers of firms other than listed public companies in each of these knitted underwear and outerwear, and hosiery industries and they may be engaged in only one or two of the industries. The same applies, of course, in our other industrial groups.

sheets of the firms. The accounting date on which the asset values are based varies from firm to firm. Therefore we have grouped accounting dates within each financial year so that, for example, when we refer to 1950 we mean the period between 1 July 1949 and 30 June 1950. All values are measured in terms of Australian pounds even after the conversion to decimal currency in February 1966.

CHAPTER II

MARKET STRUCTURE AND SIZE DISTRIBUTION OF THE FIRMS

This chapter is devoted to a description of the nature and extent of the industrial concentration of Australian manufacturing in the period between 1950 and 1967. The study of the growth of firms in the following chapters draw upon the tentative conclusions reached here. In section I we examine the extent of business concentration, and its change during the period considered is examined in section II. In section III the changing pattern of the size distribution of our selected industrial firms is analyzed for the same period.

SECTION I: Business Concentration(1)

Although several pioneer works have established the existence of a considerable degree of monopoly power in Australia,(2) very little is known in precise terms about the extent and distinctive characteristics of concentration of industries in this country. Also much of the published analysis has now become obsolete. The failure of industrial census authorities to request information on ownership of subsidiary companies or to tabulate the market shares of companies is mainly responsible for the paucity of information in this field. In the following pages an attempt is made to estimate the degree of concentration in Australian manufacturing industries. The term 'concentration' may refer to market concentration (business concentration) or to the concentration of economic power (dominance of large firms in an economy as a whole), or both. In this section we consider the extent of business

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(1) This section is largely based on our previously published article, 'An Estimate of the Business Concentration of Australian Manufacturing Industries'. Economic Record, Vol.44, (March 1968), pp.26-41.

(2) For example, A. Hunter, 'Restrictive Practices and Monopolies in Australia', Economic Record, Vol.37, March (1961), pp.25-52; and P.H. Karmel and M. Brunt, The Structure of the Australian Economy (Melbourne: F.W. Cheshire, 1963), pp.48-102. On a related problem, see also E.L. Wheelwright, Ownership and Control of Australian Companies, A Study of 102 of the Largest Public Companies Incorporated in Australia (Sydney: Law Book 1957), and J. Miskelly and E.L. Wheelwright, Anatomy of Australian Manufacturing Industry (Sydney: Law Book, 1967).

concentration measured by the degree to which a small number of large firms dominate an industry (or market). Concentration used in the second context will be considered in section III.

There are various methods of measuring business concentration in this general sense. The most popular method is to calculate the proportion of output or employment (or assets, etc.) accounted for by a fixed number of the largest firms.(1) This measure has been used to analyze American and British data(2) but suitable statistical information is not available to enable reasonably comprehensive examination of business concentration in Australia. Another less frequently applied method, and the one used in the present article, is to estimate the number of the largest firms required to account for a given proportion of output or employment. A particular version of this second measure has been employed by M. Brunt for classifying 142 Australian manufacturing industries in 1957-58 into four groups of different concentration ratios.(3) They are:

1 Highly concentrated industries: the largest four firms accounting for at least 50 per cent of total employment in each industry.

2 Fairly concentrated industries: the largest eight firms accounting for at least 50 per cent of total employment in each industry.

3 Slightly concentrated industries: the largest twenty firms accounting for at least 50 per cent of total employment in each industry.

4 Unconcentrated industries.

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(1) The methodology of measurement is surveyed in G. Rosenbluth, 'Measures of concentration', in Business Concentration and Price Policy, National Bureau of Economic Research (Princeton Univ. Press, 1955), pp.57-94.

(2) For example, U.S. National Resources Committee, The Structure of the American Economy, 1939, Part I, Appendix 7; U.S. Department of Commerce, Concentration of Industry Report, 1949; H. Leak and A. Maizels, 'The Structure of British Industry', Journal of the Royal Statistical Society, Vol.108, Parts I-II, (1945), pp.142-99; and R. Evely and I.M.D. Little, Concentration in British Industry (Cambridge Univ. Press, 1960).

(3) Karmel and Brunt, op.cit., p.78.

According to Brunt's computation, well over half of these 142 industries (covering 89 per cent of total manufacturing industries in terms of employment) were identified as 'highly' or 'fairly' concentrated industries.(1) It is clear in this approach that the selection of a 50 per cent share of employment as the basis for each concentration category conceals many examples of monopolistic, duopolistic or strongly oligopolistic industry structures. This is particularly so in the small Australian economy where only a limited number of firms may be required to satisfy the demand of a particular market. Received theory and observations suggest that there are important differences between the market behavior of industries which are dominated by one, two, three, four or five companies and other industries.(2) Thus it is important, first, to enlarge the share of the market to be used as the basis of the concentration measurement; and, second, to specify the exact number of firms occupying this share in each industry. Such a procedure will depict more precisely the state of concentration not only at the monopolistic end of the spectrum but also in the moderately concentrated and even unconcentrated industries.

For this purpose a measure which indicates the actual number of firms required to account for 80 per cent of output or employment is selected. Such a measure was employed by Rosenbluth to analyse the business concentration of manufacturing industries in Canada, a country which appears to have an industrial structure and, a fortiori, many business behavior problems similar to those of Australia.(3)

Thus in Table 2.1 business concentration in manufacturing industries in 1961-62 has been tabulated in terms of the number of the largest firms required to account for at least 80 per cent of gross output

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(1) Ibid., pp.78-81.

(2) For a thorough discussion of this problem, see J.S. Bain, Industrial Organization (New York: Wiley, 1959), pp.266-427; and C. Kaysen and D.F. Turner, Anti-trust Policy: A Legal and Economic Analysis (Cambridge, Mass.: Harvard Univ. Press, 1959).

(3) G. Rosenbluth, Concentration in Canadian Manufacturing Industries (Princeton Univ. Press, 1957).

or employment. The 'firm' is defined as the aggregate of establishments under single ownership and under the same trading name.(1) Eighty per cent is chosen primarily because this proportion measures the number of effective competitors who must be studied for a reasonably representative picture of an industry. This percentage is also the easiest to estimate from the published information to hand in Australia. Gross output and/or employment have been used in this study because they are the best available measures of the size of firms.(2) We have sought primarily to obtain the gross output concentration ratio, as this directly measures the share of the sales handled by the largest firms in an industry. But the limitations on information have forced us to use employment figures for the greater part of the study. (This does not appear to alter the ranking of concentrated industries.)

Our 109 manufacturing industries are arrayed in Table 2.1 in the order of their degree of business concentration, based first on gross output ratios and then on employment ratios (where gross output ratios are not available). If the degree of concentration is equal in two or more industries, then they are arrayed in alphabetical order. The study is based only on published information as shown in the notes accompanying Table 2.1; and the year 1961-62 has been chosen as the base year because this is the latest year for which relatively comprehensive public sources

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(1) Two points should be noted regarding the definition of the 'firm'. First, a subsidiary company in which more than 50 per cent of shares or voting power is held by a parent company is not counted as a separate firm in Table 2.1. However, there may be some minor exceptions where it has not been possible to amend available information. Second, this de jure definition of a subsidiary company does not necessarily coincide with de facto controlling power of a parent company over its subsidiaries. Large companies are sometimes able to control smaller ones when controlling less than 50 per cent of share-holdings. These two factors, therefore, may contribute to an understatement of the true extent of business concentration in Table 2.1. See Wheelwright, Ownership and Control, op.cit., pp.82-110, on this problem.

(2) Apart from these indicators, there are some other statistical indicators of concentration such as 'productive capacity' and 'value of assets'. Probably the concept of 'value added' (net output) gives the best results. Different indices may result in some differences in ranking. Generally, however, the possible degree of divergence would seem to be relatively small. For a more thorough discussion of this problem, see A. Hunter, Competition and the Law (London: Allen & Unwin, 1966), pp.45-7; and Evely and Little, op.cit., pp.32-4.

Table 2.1

Index of Business Concentration, 109 Manufacturing Industries, Australia, 1961-62

Industry	Total number of firms (a)	Employment (l)	Number of largest firms required to account for at least 80% of employment	Number of largest firms required to account for at least 80% of gross output	Relation to industrial classification of Commonwealth Bureau of Census and Statistics (w)
Aluminium smelting and refining	1	(m)	1	1	Part of 'extracting and refining of other metals; alloys'
Arms, ammunition (excluding explosives)	1	6,159	1	1	X
Ball bearings - precision ground	1	300	1	1	Part of 'plant, equipment and machinery, including machine tools'
Glass bottles	1(b)	3,801	1	1	X
Government printing	1	3,547	1	1	X
Lead refining	1	(m)	1	1	Part of 'extracting and refining of other metals; alloys'
Pig iron, steel ingots and tin plate	1(c)	30,514	1	1	Part of 'smelting, converting, refining, rolling of iron and steel'
Ship building, etc.- government	1	6,639	1	1	'Ship and boat building and repairing, marine engineering - government'
Sheet glass	1	5,919(n)	1	1	Part of 'glass (other than bottle)'
Sugar refineries	2	1,950(c)	1	1	Part of 'food, drink and tobacco - other'
Tram cars and railway rolling stock-government and municipal	1	35,466	1	1	X
Gelatine and animal glue	3	750	n.a.	1	Part of 'food, drink and tobacco-other'
Alkalies	6	750	1	1	Part of 'industrial heavy chemicals and acids'

Table 2.1 (continued)

Industry	Total number of firms (a)	Employment (l)	Number of largest firms required to account for at least 80% of employment	Number of largest firms required to account for at least 80% of gross output	Relation to industrial classification of Commonwealth Bureau of Census and Statistics (w)
Breweries	8	5,396	2-(q)	2-	X
Ceramic floor and wall tiles	2	300	2-	2-	Part of 'bricks and tiles'
Coke works	7	1,853	2-	n.a.	X
Fibreboard	2	1,000	2-	n.a.	Part of 'wall and ceiling boards (not plaster or cement)'
Flax mills	2	149	2-	2-	X
Refined zinc	2	(m)	2-	2-	Part of 'extracting and refining of other metals; alloys'
Tin smelters	mainly 2	(m)	2-	2-	Part of 'extracting and refining of other metals; alloys'
Cutlery and flatware	about 7	270	n.a.	2	Part of 'cutlery and small hand tools'
Electric lamps	4	669	2	n.a.	Part of 'electric machinery, cables and apparatus'
Explosives and fireworks	n.a.	1,655	2	2	X
Iron and steel tube and pipe fittings	n.a.	8,303	n.a.	2	'Pipes, tubes and fittings -ferrous'
Matches	3	539	2	2	X
Aircraft-manufacturing and maintenance	(d)	11,450	3-	n.a.	X
Artificial flowers	mainly 3	179	3-	3-	X
Asbestos cement sheets and mouldings	3	2,811	3-	3-	X
Chain and chains	3	202	3-	3-	Parts of 'plant, equipment and machinery including machine tools' and 'other engineering'

Table 2.1 (continued)

Industry	Total number of firms (a)	Employment (l)	Number of largest firms required to account for at least 80% of employment	Number of largest firms required to account for at least 80% of gross output	Relation to industrial classification of Commonwealth Bureau of Census and Statistics (w)
Copper refineries	3	8,026	3-	3-	Part of 'extracting and refining of other metals; alloys'
Smooth floor coverings -linoleum, etc.	5	600	3-	n.a.	Part of 'textile and textile goods-other'
Tobacco, cigars, etc.	mainly 4	4,914	n.a.	3-	X
Biscuits	n.a.	6,092	n.a.	3	X
Margarine	6(e)	1,335	n.a.	3(e)	X
Paper-making	11	8,147	n.a.	3	X
Petroleum refining	5(f)	5,034	3	n.a.	'Oils, mineral'
Cotton spinning	11	3,500	n.a.	4-	Part of 'cotton spinning and weaving'
Cotton weaving	18	2,800	n.a.	4-	Part of 'cotton spinning and weaving'
Motor vehicles	about 30	45,977	n.a.	4-(t)	'Motor vehicle-construction and assembly' and 'motor bodies'
Rubber products (including tyres)	about 22	14,040	n.a.	4-	'Rubber goods'
Shipbuilding-non-government	(g)	3,000(j)(p)	4-(j)	n.a.	Part of 'ship and boat building and repairing, marine engineering'
Vegetable oils	about 15(h)	725	n.a.	4-(h)	X
Radio receivers	about 20	1,500	5-	5-	Part of 'electrical machinery, cables and apparatus'
Plastic materials	about 9	900	5-	n.a.	Part of 'industrial and heavy chemicals and acids'
Carpets	17	2,100	n.a.	5	Part of 'textiles and textile goods-other'
Fish-canning	mainly 5	about 400	n.a.	5	Part of 'meat and fish preserving'

Table 2.1 (continued)

Industry	Total number of firms (a)	Employment (l)	Number of largest firms required to account for at least 80% of employment	Number of largest firms required to account for at least 80% of gross output	Relation to industrial classification of Commonwealth Bureau of Census and Statistics (w)
Non-ferrous metal-rolling and extrusion	12	3,800	n.a.	5	X
Ice cream, butter, etc	n.a.	10,758	5	n.a.	'Butter factories', 'Cheese factories' and 'Ice cream'
Soap and candles	about 100	3,300	5	n.a.	X
Wool tops	17	2,430(j)	8(j)	5(j)	Part of 'wool-carding, spinning, weaving'
Railway rolling stock	15(i)	3,122	6-	n.a.	Part of 'tram cars and railway rolling stock'
Umbrellas and walking sticks	about 10	285	n.a.	6-(u)	X
Internal combustion engines	mainly 26	900	6	n.a.	Part of 'electrical machinery, cables and apparatus'
Newspaper and periodicals	n.a.	15,542	n.a.	6(v)	X
Portland cement	12	3,126	n.a.	6	X
Leather tanning and currying	about 100	4,175	n.a.	7-	X
Domestic refrigerators	11	about 2,800	8-	8-	Part of 'electrical machinery, cables and apparatus'
Handkerchiefs	10	500	8	n.a.	Part of 'handkerchiefs, ties and scarves'
Builders' hardware	about 70	2,600(j)	7- 10(j)	n.a.	Parts of 'boxes and cases' and 'plant, equipment and machinery including machine tools'
Domestic washing machines	17	1,750	7- 10	n.a.	Part of 'electrical machinery, cables and apparatus'
Electric power transformers	18	1,800	7- 11	n.a.	Part of 'electrical machinery, cables and apparatus'

Table 2.1 (continued)

Industry	Total number of firms (a)	Employment (l)	Number of largest firms required to account for at least 80% of employment	Number of largest firms required to account for at least 80% of gross output	Relation to industrial classification of Commonwealth Bureau of Census and Statistics (w)
Farm machinery	about 400	11,363	8- 10	n.a.	'Agricultural machines and implements'
Chemical fertilisers	15	4,537	10-	10-	X
Man-made fibres spinning and weaving	13	3,919	9- 10	n.a.	'Rayon, nylon and other synthetic fibres'
Concrete and concrete products	n.a.	7,116	10	10	'Other cement goods'
Pharmaceuticals	about 150	4,000	10(r)	n.a.	Part of 'pharmaceutical and toilet preparations'
Television receivers	15	4,000	11-	n.a.	Part of 'electrical machinery, cables and apparatus'
Electric wires and cables	about 20	3,800	13-	n.a.	Part of 'electric machinery, cables and apparatus'
Jam, fruit and vegetable preserving and vinegar, etc.	about 130	12,379	13- 15(s)	n.a.	'Jam, fruit and vegetable canning' and 'pickles, sauce, vinegar'
Excavating, earth-moving and construction equipment	about 40	2,500	15-	n.a.	Part of 'plant, equipment and machinery including machine tools'
Hand tools	about 65	1,760	13- 18	n.a.	Parts of 'plant, equipment and machinery' and 'cutlery and small hand tools'
Bags and sacks	77(j)	1,292	13- 20	n.a.	X
Valves	about 40	1,600	17	n.a.	Part of 'electrical machinery, cables and apparatus'
Electric switch and control gear	about 30	2,450	18	n.a.	Part of 'electrical machinery, cables and apparatus'
Industrial chemicals	n.a.	11,498	15- 21	n.a.	'Industrial and heavy Chemicals' excluding 'alkalies'

Table 2.1 (continued)

Industry	Total number of firms (a)	Employment (l)	Number of largest firms required to account for at least 80% of employment	Number of largest firms required to account for at least 80% of gross output	Relation to industrial classification of Commonwealth Bureau of Census and Statistics (w)
Domestic electric appliances	about 35	3,100	20-	20-	Part of 'plant, equipment and machinery including machine tools'
Domestic cooking stoves	75(h)	4,600	n.a.	21-	'Stoves, ovens and ranges'
Electric motors	44	2,375	22	n.a.	Part of 'electric machinery'
Machine tools and metal working machines	about 60	2,000	23-	n.a.	Part of 'plant, equipment and machinery including machine tools'
Paints	about 140	5,140	n.a.	23-	X
Pumps	73	1,500	20 - 25	n.a.	Part of 'plant equipment and machinery including machine tools'
Roofing tiles	47	1,600	27-	n.a.	Part of 'bricks and tiles, earthenware, china, porcelain, terra-cotta and other cement products'
Wool scouring, carbonizing and fellmongering	about 50	2,809	25 - 29	n.a.	X
Hosiery	about 70(h)	7,500	29-	n.a.	Part of 'hosiery and other knitted goods'
Knitted underwear	about 160	9,000	20 - 30	n.a.	Part of 'wool-carding, spinning, weaving'
Wool weaving	69(j)	7,900	33	32	Part of 'wool-carding, spinning, weaving'
Plywood	about 70	3,238	33-	n.a.	'Plywood mills (including veneers)'
Wool dyeing and finishing	45(h)	1,847	35-	n.a.	Part of 'textile dyeing, printing and finishing'
Ferrous forgings	about 170	4,000	37	n.a.	Part of 'smelting, converting, refining, rolling of iron and steel'
Flour milling	n.a.	4,429	40	40	X
Meat and fish preserving	n.a.	9,544	40	n.a.	X
Domestic electric lighting fixtures	75	1,200	41-	n.a.	Part of 'electrical machinery, cables and apparatus'

Table 2.1 (continued)

Industry	Total number of firms (a)	Employment (l)	Number of largest firms required to account for at least 80% of employment	Number of largest firms required to account for at least 80% of gross output	Relation to industrial classification of Commonwealth Bureau of Census and Statistics (w)
Travel goods, handbags, etc.	n.a.	2,500	40 - 45	n.a.	Part of 'bags, trunks and other goods of leather'
Automobile parts	about 200	14,000	45 - 50	n.a.	'Motor accessories'
Cranes and hoists, etc.	84	2,400	45 - 50	n.a.	Part of 'plant, equipment and machinery including machine tools'
Men's and boys' ready-made outer clothing	about 240	12,000	70 - 75	n.a.	Part of 'tailoring and ready-made clothing'
Structural steel fabrication	about 250	8,000	85-	n.a.	Part of 'plant, equipment and machinery, including machine tools'
Knitted outerwear	about 310	7,800	100-	n.a.	Part of 'hosiery and other knitted goods'
Wooden containers	about 270(h)	2,608	100	n.a.	'Boxes and cases'
Plastic products	276(k)	10,554	100	n.a.	'Plastic moulding and products'
Footwear-leather	n.a.	20,275	120 - 140	n.a.	'Boots and shoes (not rubber)'
Ferrous casting	about 380	9,500	210 - 220	n.a.	'Foundries, ferrous'
Plaster and plaster products	about 450	3,000	210 - 220	n.a.	Parts of 'lime plaster of paris, asphalt' and 'fibrous plaster and products'
Women's outer garments, etc.	about 1,500	34,000	400 - 450	n.a.	Parts of 'tailoring and ready-made clothing' and 'dressmaking, hemstitching'
Furniture making	n.a.	15,261	500	n.a.	'Cabinet, furniture making and upholstery'
Sawmills	about 2,500	29,971	900 - 1,000	n.a.	X
Shoe repairs	n.a.	3,656	1,000	n.a.	'Boot and shoe repairing'
Bakeries	n.a.	20,901	1,300 - 1,700	n.a.	'Bakeries (including cakes and pastry)'
Motor repairs	n.a.	63,276	3,500	n.a.	X

Notes on Table 2.1

General: No doubt changes have taken place in the structure of certain industries since 1961-62. It is also possible that some sources contain minor errors.

(a) Only firms engaged in production in an industry in 1961-62 have been included.
(b) There was one more small firm employing less than 100 persons.
(c) Outside B.H.P. group, a small amount of pig iron, steel ingots, flat-rolled products, etc. was manufactured by the Western Australian government and several privately-owned companies.
(d) The industry consisted of the manufacture of aircraft and engines, parts and accessories, and maintenance activities. Two companies, the Commonwealth Aircraft Corporation Pty. Ltd. and the De Haviland Aircraft Pty. Ltd., and Commonwealth government aircraft factories were engaged in manufacturing aircraft and engines and a large proportion of parts and accessories. The maintenance of civil aircraft was mainly carried out by De Haviland, and the maintenance of defence aircraft by the Commonwealth air force.
(e) Based on the government quota limitation given to manufacturers in 1965-66.
(f) Five refining companies together with some small firms engaged in blending, formulating, packing, etc.
(g) Four firms and one naval dockyard. There were also many small yards building fishing and pleasure craft.
(h) 1960-61 basis.
(i) Excluding railway workshops.
(j) 1958-59 basis.
(k) The Commonwealth Bureau of Census and Statistics recorded 276 firms in this industry in 1958-59, but the total number of firms would probably have been 600 if small firms engaged in processing plastic articles had been included.
(l) Unless otherwise stated, 'employment' means the number of persons directly engaged in production.
(m) Included in the employment of 'copper refineries'. Separate information is not available.
(n) Including sheet glass, glassware, safety glass and glass components for electric lamps, but not including fabricating, sandblasting, leadlighting and glazing.
(o) Estimate of Karmel and Brunt for the year 1957-58 (op.cit., p.84).
(p) Including some workers not directly engaged in production.
(q) Virtual regional monopoly by States was established. However, the N.S.W. market (where about 1,900 persons were employed) was supplied by three firms, and a small part of the Queensland market was supplied by a second company.
(r) Based on information on employment figures including workers indirectly connected with production.
(s) Employment is difficult to estimate in this industry because of important seasonal fluctuations in activity. The firms concerned provide only rough approximations of employment to the Department of Trade and Industry (see Structure and Capacity of Australian Food Processing Industries, Pickles, Sauces and Vinegar, and Jam, Fruit and Vegetable Canning, March 1960). Where, for example, a firm's work force was given as 'several hundreds', we made a conservative estimate of 300. Where a work force range such as '500 to 1,000' was given, we arbitrarily estimated annual employment as lying at the mean, or 750 in this example.
(t) Based on the number of cars newly registered in 1960-61.
(u) In terms of quantity of output.
(v) This is a rough estimate mainly based on the circulation figures of metropolitan and country daily papers, metropolitan Sunday and Saturday papers, and major journals and magazines which take advertisements. See H. Mayer, The Press in Australia (Melbourne: Lansdowne Press, 1964); and Naards Service (Sydney: Australian Advertising Rate and Data Service, N.S.W.), 1962-63 and 1963-64.
(w) 'X' indicates the same industry classification as that in the Secondary Production Bulletin.

Sources of Table 2.1

Government publications:

Commonwealth of Australia, Report of the Committee of Economic Enquiry, 1965. Commonwealth Bureau of Census and Statistics, Secondary Production Bulletin, Parts I and II, 1961-62. Department of Trade and Industry (Industry Study Series): The Australian Aluminium Industry, May 1960; Australian Automotive Parts Industry, April 1962; The Australian Excavating, Earthmoving and Allied Construction Equipment Industry, March 1959; The Australian Ferrous Forging Industry, June 1960; The Australian Fertilizer Industry, August 1960; The Australian Leather Industry, May 1960; The Australian Packaging Industries, 1959; The Australian Paint Industry, January 1957; The Australian Wool Textile Industry and its Use of Wool and Other Fibres, 1961 (joint publication with Bureau of Agricultural Economics); Plastic Industry of Australia, May 1958; The Rubber Products Industry, March 1958. Department of Trade and Industry (other publications): The Australian Pharmaceutical Products Industry, January 1960; Steel Industry of Australia, November 1958; Structure and Capacity of Australian Food Processing Industries, Pickles, Sauces and Vinegar, and Jam, Fruit and Vegetable Canning, March 1960 (2 volumes); Directory of Australian Chemicals (4th ed.), 1962; Survey of Manufacturing Activity in Australia, 1957-61; Survey of Manufacturing Industry in Australia, 1959 and 1962; A General Survey of Australia's Industrial Capacity and Future Developments, Industrial Mobilization Course, 1966. Tariff Board, reports on various enquiries into manufacturing industries.

Sources other than government publications:

Various company reports and trade journals.

Books:

Bushnell, Australian Company Mergers, 1946-1959 op.cit.; A. Hunter (ed.), The Economics of Australian Industry. Studies in Environment and Structure op.cit.; Karmel and Brunt, The Structure of the Australian Economy op.cit.

are available. The classification of the 109 industries is based largely on the one used by the Commonwealth Bureau of Census and Statistics, but where necessary these industries have been reclassified more specifically so as to include a product or a group of substitute (competitive) products in an industry. It is usually suggested that all products or enterprises with large long-run cross-elasticities of either supply and/or demand should be combined into a single industry.(1) For example if margarine is regarded by numbers of buyers as a perfect substitute for butter, then the margarine and butter manufacturing industries should be combined as one industry for this is a case of high demand substitution. If numbers of producers of chocolate often move into the biscuit producing field then these two industries should also be combined into one as they represent an example of high supply substitution. Our classification of the 109 industries, however, is mainly based on the long-run demand cross-elasticity criteria. This is because information on cross-elasticity of demand is relatively easily available on an empirical basis sometimes aided by our personal experience as consumers, whereas, on the other hand, our knowledge about cross-elasticity of supply is very limited for most of the industries. The relation between our 109 industries and the Bureau's industries is explained in the last column of Table 2.1.

Because the aim has been to give, with the extremely limited information available, a reasonably comprehensive picture of the concentration of manufacturing industries in Australia, some incomplete statistical data have been used where they could be supplemented by other evidence. In such cases the index is suffixed by a minus sign indicating that it may possibly be smaller than the given figure (i.e. concentration ratios are calculated conservatively). When exact figures are not available, the possible ranges of estimation such as '2-3' are given and

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(1) The problem of industry classification for the study of business concentration is discussed extensively elsewhere. See, for example, M.R. Conklin and H.T. Goldstein, 'Census Principles of Industry and Product Classification', in Business Concentration and Price Policy, op.cit., pp.15-55 and G.J. Stigler 'Introduction' to Business Concentration and Price Policy, Ibid., pp.3-14.

the average of these two figures is taken for arraying the industries in Table 2.1. In either case Table 2.1 is based on a 'conservative' estimation of concentration ratios so that any adjustment would probably need to be towards a higher degree of business concentration. In spite of all efforts, the coverage of the industries is not fully comprehensive. These 109 industries employ about 64 per cent of the manufacturing work force excluding the 'heat, light and power' industries. The poorest coverage is in the industry groups 'plant, equipment and machinery and other engineering', 'electrical machinery and cables', 'sheet metal working', and 'food processing'. It should also be noted that the concentration ratios in Table 2.1 are based on the national market (except for the brewing industry); no account is taken of the extent of regional or local concentration, which can be substantial where heavy transport costs are involved. Also no allowance is made for production for export purposes. Such a procedure overestimates the market share of those firms whose products are destined for overseas markets. On the other hand, the significance of imports has not been considered; and in certain instances, depending on tariff levels and varying from year to year, the role of imports in providing competition is very important and should be brought in to qualify the results. Further attention is drawn to these aspects when we analyse the profitability and growth behavior of our 402 firms in the following chapters.

In spite of these weaknesses, Table 2.1 provides us with a certain perspective of business concentration in Australian manufacturing industries.

In Table 2.2, our 109 industries are classified into seven groups. This classification is based on the structural characteristics of the industries as indicated in Table 2.1. However, received theory and observation of business behavior in industries operating under varying degrees of concentration were also taken into consideration when deciding upon the exact dividing lines.

Table 2.2

Speculative Classification of 109 Manufacturing Industries, Australia, 1961-62

Concentration groups	Description	No. of industries in each class	% of no. of industries		Employment in each class	% of employment in 109 industries		% distribution of employment of each class in total manufacturing industries
			In each class	Cumulative		In each class	Cumulative	
1 Monopolistic & duopolistic industries	Largest 1 to 2 firms account for at least 80% of industry's gross output and/or employment.	25	22.9	22.9	115,179	16.5	16.5	10.4
2 High-oligopolistic industries	Largest 3 to 5 firms account for at least 80% of industry's gross output and/or employment.	25	22.9	45.8	144,020	20.5	37.1	13.0
3 Moderate-oligopolistic industries	Largest 6 to 10 firms account for at least 80% of industry's gross output and/or employment.	16	14.7	60.5	67,565	9.6	46.7	6.1
4 Low-oligopolistic industries	Largest 11 to 21 firms account for at least 80% of industry's gross output and/or employment.	11	10.1	70.6	49,729	7.1	53.8	4.5
5 Unconcentrated industries	Largest 22 to 50 firms account for at least 80% of industry's gross output and/or employment.	18	16.5	87.1	83,093	11.9	65.7	7.5
6 Competitive industries	Largest 51 to 220 firms account for at least 80% of industry's gross output and/or employment.	8	7.3	94.4	73,737	10.5	76.2	6.7
7 High-competitive industries	More than 220 largest firms account for at least 80% of industry's gross output and/or employment.	6	5.5	100.0	167,065	23.8	100.0	15.1
Total		109	100.0		700,388			63.5

Source: Table 2.1

Theoretical criteria for classifying industrial concentration are available in broad terms: 'monopolistic' industries are those where only one large firm dominates, and in 'duopolistic' industries there are two dominant firms in terms of market share (or some other alternative measure). Four of the 'monopolistic' industries - arms and ammunition, government printing, government ship building, etc., and government and municipal tram cars and railway rolling stock - are controlled by the Commonwealth government or municipal authorities.

Based on structural criteria, 'olipolistic' industries are defined here as those in which there exists a concentrated core of large firms with a competitive fringe of smaller ones. Of the biggest three or four or more firms, each is sufficiently large that any price adjustment on the part of one will perceptibly affect the others and presumably induce reactions. In Table 2.2 the 'oligopolistic' industries are further divided into three groups, 'high', 'moderate', and 'low'.

The 'high-oligopolistic' group consists mostly of medium- to large-scale industries in terms of employment. Industries in this group, together with 'duopolistic' industries, can scarcely ignore the inter-dependence imposed on business behavior by their small numbers. Mutual understanding and parallelism of policy are likely between the largest three or four or more firms on such matters as prices, products and qualities. If one of the firms is significantly larger than the others, parallel behavior may take the form of price leadership. In these circumstances the more overt collusive practices, such as formal or verbal agreements on price or output, or observance of the recommendations of a trade association, are unnecessary.

As the degree of concentration lessens to the 'moderate oligopolistic' group, we may find several price-fixing and other collusive practices led by the core of larger firms or organized by manufacturers' associations. This is perhaps because simple interdependence cannot fully be relied upon when the number of business units becomes larger and the degree of interdependence declines. Australia- wide price-fixing

arrangements are known to exist in cement, builders' hardware, pharmaceutical, newspapers, periodicals and publishing industries and in some sectors of the electrical equipment industry.(1)

In the 'low-oligopolistic' group, there are 11 industries with a fairly large number of business units (an average of 70 firms in an industry). It may be thought that some industries in this group should be termed competitive. Conceivably they are. But few of them are so structured that each of the 20 largest companies has approximately four per cent of the market. More typical of this group is a size-distribution which gives 10 per cent or more to each of the largest three or four companies the remainder of the market being shared among the smaller companies of the industry (e.g. excavating, earthmoving construction equipment; television receivers; electric wires and cables; jam, fruit and vegetable preserving, etc.; and hand tools). Such a structure probably makes for a price leadership pattern determined by the largest companies. Or alternatively, the price recommendations of the trade associations are strongly influenced by this quasi-oligopolistic group.

The remaining thirty-two industries are further classified into three groups, 'unconcentrated', 'competitive', and 'highly-competitive', according to the concentration ratio. The line of demarcation between these three groups is drawn rather arbitrarily but we can see the number of business units and the size of the industries increasing from the 'unconcentrated' group through the 'competitive' to the 'highly-competitive' groups. In these three concentration classes, a more 'atomistic' type of price behavior might be expected. But it is known that comprehensive, well-organized price-fixing agreements operate through a trade association in some of these industries. They include paints, plywoods, automobile parts, footwear, wood containers, fibrous plaster, saw mills, bakeries

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(1) Commonwealth of Australia, Report of the Committee of Economic Enquiry, op.cit., Vol.II, Appendix G; Hunter, 'Restrictive Practice and Monopolies in Australia', op.cit., Appendix; and Karmel and Brunt, op.cit., p.96.

and some automobile repairing works.[1] In women's hosiery and underwear, some major firms are known to act as price leaders.[2]

The preceding sevenfold classification of manufacturing industries according to the degree of business concentration is tentative although it is oriented towards received theory and influenced by some empirical observation. Thus it attempts to distinguish structural patterns which might theoretically be expected to produce different sorts of market conduct and which in some cases have been observed to do so. Ideally more than seven classes might be required. However, a classification such as the above has the merit of recognizing that 'highly concentrated industries' in Brunt's sense have in fact operated under widely varying degrees of business concentration which may lead to differences in business conduct and perhaps performance.

Overall, we may summarize the characteristics of business concentration in our 109 manufacturing industries as follows. First, Australian manufacturing industries provide several examples of textbook type monopoly and duopoly. There are six single-firm monopolies and an equal number of two-firm duopolies which together represent about 7 per cent of employment in our 109 industries and 4.2 per cent of the total manufacturing work force in 1961-62. In all, the industries which we more loosely classify as monopolies and duopolies employ 16.5 per cent of the work force in our sample. Second, the 'oligopolistic' type of structure (concentration classes 2, 3 and 4 in Table 2.2) is very common in Australia. Nearly half the industries considered fall into this category, employing 37.2 per cent of the work force covered by our sample. Thus 53.8 per cent of the work force in our sample is employed in monopolistic, duopolistic or oligopolistic industries. Third, collusive practices such as price agreements seem to be fairly widespread in manufacturing industries

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(1) Hunter, 'Restrictive Practice and Monopolies in Australia', op.cit., Appendix; and Karmel and Brunt, op.cit., p.96.

(2) Commonwealth of Australia, Report of the Committee of Economic Enquiry, Vol.II, Appendix G.

in Australia. The real extent of such practices is no doubt much larger than is indicated in the available sources on which our study is based. It is not surprising to discover that many examples of collusive practices have been detected in industries with relatively low concentration ratios.(1) Where high concentration is not available to encourage parallelism of policy, price leadership, etc., it is only to be expected that an industry will fall back on restrictive agreements if the legal position permits.

In practice there may be some examples of concentrated industries which are competitive. The widespread existence of a high degree of monopoly power in the broad sense of the term in Australian manufacturing industries is nevertheless indisputable. In order to examine further the distinctive characteristics of business concentration and its causes in this country, systematic study of individual industries supported by comprehensive statistical data on firms and plants is required.

SECTION II: Changes in Business Concentration, 1950-1967

Monopolistic and oligopolistic industries are important in the economy as a whole not only because they control large portions of the manufacturing output or work force (or any other size measure), but also because they are engaged in mostly so-called 'basic and strategic' industries such as metals, chemicals, transport equipment and oil refining which play an important role in the nation's economic development. The economic as well as quantitative importance of these monopolistic and oligopolistic industries is said to be significantly greater in Australia than in the United States of America, the United Kingdom and Canada.(2)

But has this high business concentration been increasing or decreasing since the war? The absence of comprehensive information makes it extremely difficult to characterize the changes in business concentration

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(1) Hunter, 'Restrictive Practice and Monopolies in Australia', op.cit.

(2) Karmel and Brunt, op.cit., p.87.

in the post-war period. All that one can do is to compile from various scattered pieces of information a number of rough indices of the changes in the degree of concentration either within the manufacturing industry as a whole or within various sectors of the industry in the period concerned.(1) In spite of the paucity of adequate data much can still be learned.

The change in overall concentration for all business firms in manufacturing industry is a composite result of a) changes in the relative importance of different manufacturing sectors insofar as these different sectors enjoy differing degrees of concentration, and b) changes in concentration in individual sectors of the industry. Thus the overall concentration in manufacturing industry may have risen without any increase in concentration within individual sectors because the sectors which were originally highly concentrated have become more important. This in fact happened with highly concentrated sectors (concentration groups 1 to 4 inclusive in Table 2.2 above) growing faster than the rest of the manufacturing industry. The relative growth of oligopoly type of industries was particularly noticeable in terms of value added. In addition it should be noted that this fast growth in concentrated industries largely took the form of import replacement by Australian manufacturers.(2) For example by 1962 local manufacturers met practically all the domestic requirements in at least 31 out of the total of 50 monopolistic and oligopolistic industries included in Table 2.2. The market shares of local manufacturing in the remaining 19 monopolistic and oligopolistic industries range between 40 and 80 per cent. While lack of comprehensive information prevents us from making any general statement about the differing importance of foreign competition in various industries, it seems roughly the case that the proportion of the market supplied by Australian firms appears to be larger in concentrated industries than in less concentrated fields. This observation excludes a group of industries such as shoe repairs, motor repairs and bakeries which for geographical reasons are virtually free from any import competition.

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(1) For the various sources of information used, see 'Sources of Table 2.1'.

(2) References are those included in 'Sources of Table 2.1' above.

Table 2.3[1]

Percentage of Employment and Value Added of Industries by Concentration Group[2]

	Concentration Groups 1 - 2	Concentration Groups 3 - 4	Concentration Groups 5 - 7	Industries Not Classified	Total Manufacturing Employment[3]
Employment					
June 1950	92,616	232,523	342,492	247,931	915.562
(% of the total)	(10.1)	(25.4)	(37.4)	(27.1)	(100.0)
June 1967	125,382	373,122	411,317	392,044	1,301,865
(% of the total)	(9.6)	(28.7)	(31.6)	(30.1)	(100.0)
Value Added (£'000)					
June 1950	72,309	188,694	208,870	175,115	644,984
(% of the total)	(11.2)	(29.3)	(32.4)	(27.1)	(100.0)
June 1967	353,226	1,142,692	825,171	980,876	3,301,965
(% of the total)	(10.7)	(34.6)	(25.0)	(29.7)	(100.0)

Notes: (1) Several industries which are not included either in Table 2.1 or in our'51'industrial groups are added.

(2) For the classification of concentration groups, see Table 2.2 above.

(3) Excluding public utility sectors such as light, heat and power.

Source: Commonwealth Bureau of Census and Statistics, Secondary Industries, 1950 and 1967.

The characterization of changes in business concentration in a particular market is more complex. Several pieces of rough qualitative evidence are required in order to supplement the gaps left by incomplete statistics. First of all, as we will see in a later chapter, many of the largest industrial firms have been growing very rapidly. This trend was partly due to merger movements which reached peaks in 1951-55, 1959-61 and more recently in 1966-67. As a result a great number of firms of various sizes were combined to form much larger firms than had before existed. It is reported that roughly 600 companies were delisted from the Sydney and Melbourne Stock Exchanges as a result of take-overs in the period between 1950 and 1967.[1] In addition there have been many small mergers among

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(1) Letters to the writer from Sydney Stock Exchange Ltd., 18/12/1968, and the Stock Exchange of Melbourne, 4/12/1968.

non-listed public and private companies. On the other hand, we should note that a number of newly established firms appeared in various sectors of the manufacturing industry. The Sydney and Melbourne Stock Exchanges which only quote relatively large firms added about 700 new companies to their lists during these 18 years. However, some of them cannot really be considered as newly established since they were enterprises which had previously been in business for some time as non-listed public and private firms.(1)

What then is the overall trend of post-war business concentration - has concentration in each sector of manufacturing industry increased? Were the post-war merger movements big enough to increase concentration?

J.A. Bushnell states that all but 68 out of the 678 mergers identified in the period 1947-56 were small (less than £500,000 value in 1956 prices).(2) But after 1956 many mergers were on a very large scale and as a result many new industrial giants were born.(3) A large number of take-overs were promoted in the midst of rapid economic growth. Progressive firms saw strong incentives to grow quickly and take-overs may often have enabled them to achieve this desire both rapidly and cheaply. Bushnell's study indicates that the reason for mergers are many and complex.(4) He may be correct in his conclusion that the firms concerned did not view the advantage of an increase in market share through mergers as an immediate and/or prime attraction, but our study shows that since the majority of take-overs involved firms in the same industry and market the end result was the integration of the markets of merged firms. In our sample, 95 companies were delisted from the Sydney Stock Exchange in 1950-1967 due to take-overs by other companies (including public and private companies, and other types of business organizations). Of this total 57

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(1) Ibid.

(2) J.A. Bushnell, Australian Company Mergers 1946-1959, (Melbourne Univ. Press 1961), pp.16-18.

(3) Ibid., pp.180-93.

(4) Bushnell, ibid., see in particular pp.77-80.

firms were absorbed by companies in the same industries.(1) Since mergers replace two (or more) smaller firms with a larger one in the market, they counter the effect of new entries.

We now turn to a consideration of the extent of changes in business concentration accompanying the Australian merger movements. No one has yet made any systematic study of the resulting business concentration in manufacturing.(2) The idea of changes in concentration as a statistical concept is ambiguous and sometimes misleading. The number and size distribution of sellers may change in a complex way over time so that while one measure may indicate that the control of a market is becoming more concentrated, a second method may simultaneously indicate the reverse.(3) An ideal measurement of concentration would require complete information on the number and size distribution of all sellers in

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(1) In more detail, there are 113 discontinued firms in our sample, 95 of which ceased to operate as independent concerns as a result of take-overs. Of these 95, 57 firms were taken over by companies in the same industries, 11 by companies in related industries, and 15 by companies in unconnected industries. In the remaining 12 cases, we were unable to ascertain the industry classifications of the absorbing enterprises. A similar pattern emerges from a study made by A.D. Barton of Australian company take-overs. Barton found that in 1957-62 the majority (169 out of 200) of mergers examined - which represented approximately two-thirds of all public company take-overs during the five year period - were achieved between companies operating in the same industries. A.D. Barton, 'Company Take-Overs in Australia, 1957-62' Australian Accountant, Vol.34, (Feb., 1964) pp.79-88.

(2) Karmel and Brunt refer to several factors which appeared to have conceivably affected the degree of concentration in the period. Karmel and Brunt, op.cit., pp.60-1. An overall long-run stability of plant concentration in manufacturing between 1914 and 1963-4 is detected by P. Brown and H. Hughes, but concentration by plant is a different concept from concentration of firm (business concentration). P. Brown and H. Hughes 'The Market Structure of Australian Manufacturing Industry, 1914-1963-4', paper presented at 40th Australian and New Zealand Association for the Advancement of Science Conference, Christchurch, New Zealand, 1968.

(3) For example, consider a market in which initially the largest four firms control 60% of the total output, the largest eight supply 80%, and there are 150 sellers in the industry. Over the succeeding 10 years the concentration changes and the market control of the first four firms decreases to 50%, but that of the first eight increases to 85% and the total number of sellers decreases to 100. Has concentration increased or decreased?

a market. Except for only a limited number of industries there is no such information available in Australia. The best we can do, therefore, is to draw together such evidence as is available in an attempt to provide several rough indicators of changes in business concentration. The devices used below are similar to those suggested by Bain when trying to estimate the changes in concentration in American manufacturing industry for the 40 year period between 1865 and 1905.(1) Assisted by knowledge obtained from Table 2.1 above we are able to indicate some features of changing market structure in several manufacturing sectors by resource to the three following indicators. (a) Measurement of the proportion of the market controlled by the single largest firm. (b) Measurement of the proportion of an individual industry's output supplied by a limited number (3, 4, 5 or 6) of the largest firms - in other words measurement of the extent of market control by the oligopolistic core of the industry.(2) (c) Measurement of the proportion of an industry's output controlled by a larger number (10 to 20) of the largest firms in the industry.(3)

Use of these three indicators suggests that concentration increased in the following sectors of manufacturing industry in the period 1950 to 1967.(4)

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(1) J.S. Bain, Industrial Organization, op.cit., pp.191-4. Bain's suggestions were a measurement of the proportion of the market share controlled by the single largest firm, the largest four firms, and a somewhat larger absolute number of firms in the industry.

(2) See p.19 above.

(3) See pp.19-20 above.

(4) In order to estimate the changes in concentration in terms of the suggested indicators, the following references were used as major sources in addition to Table 2.1 above: Bushnell, op.cit., pp.122-165 and 192-211, and Department of Trade and Industries, Industry Study Series (several series published between 1958 and 1962).

Table 2.4

Changes in Market Structures, 1950-1967

Industries	Observed Changes in Market Structure[1]
Indicator (a)	
Breweries:	from high-oligopoly to near monopoly[2]
Tobacco:	from moderate-oligopoly to high-oligopoly
Icecream, butter, margarine and vegatable oils:	from low or moderate-oligopoly to high-oligopoly
Heavy machines (earth moving and construction equipment etc):	remained low-oligopoly, but the top firm increased its market share
Indicator (b)	
Paper making:	moderate-oligopoly to high-oligopoly
Rubber products:	moderate-oligopoly to high-oligopoly
Biscuits, etc:	moderate-oligopoly to high-oligopoly
Wooden containers:	moderate-oligopoly to high-oligopoly
Carpets	moderate-oligopoly to high-oligopoly
Newspapers	low-oligopoly to moderate-oligopoly
Leather manufacturing:	unconcentrated to moderate-oligopoly
Industrial chemicals:	unconcentrated to low-oligopoly
Indicator (c)	
Jam, fruits and vegatable preserving etc.	unconcentrated to low-oligopoly
Electrical machines:	unconcentrated to low-oligopoly
Wool textiles:	competitive to unconcentrated
Wool scouring, carbonizing, etc.	competitive to unconcentrated
Knitting and hosieries:	competitive to unconcentrated
Automobile parts:	competitive to unconcentrated
Cranes and hoists, etc:	competitive to unconcentrated
Bakeries:	remained high-competitive, but larger firms increased their market shares
Saw mills:	remained high-competitive, but larger firms increased their market shares

Notes: (1) For the classification of market structure, see Table 2.1 above.

(2) The market structure differs slightly from state to state.

The above observations can be supplemented by evidence relating to concentration by plant as measured by the number of the largest plants required to account for at least 80% of an industry's work-force.[1] Such plant concentration increased in a significant number of relatively less

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(1) Brown and Hughes, op.cit., Table 1.

concentrated industries and was particularly noticeable in iron-founding, wood container manufacturing, shoe manufacturing, flour milling and various fields of the clothing industry. Since we do not know much about the extent of multi-plant operation among firms engaged in Australian manufacturing industry it is difficult to generalize about the effect of plant concentration on the changes in business concentration. Nevertheless, it is normally to be expected that such increases in plant concentration would have brought about an increase in business concentration in the industries concerned.

We are now able to conclude that business concentration measured by one of the above three suggested indicators increased in a significant number of industries whose aggregated employment based on 1962 statistics(1) amounted to at least one-third of the total manufacturing work-force (excluding heat, light and power). There are many large industries which were already highly concentrated at the beginning of the period studied and their market structures have remained unchanged. These industries include the manufacture of pig iron, steel ingots, tin plate, sheet glass, glass containers, explosives, smelting and refining of aluminium, lead, zinc, tin, copper, sugar refining, and several government and state-owned industries. They accounted for slightly more than a quarter of total manufacturing employment in 1967.

Concerning the remaining industries which represent a little less than half of manufacturing activity in terms of employment, information is much more limited particularly about industries in which business concentration has appeared to decline during the period. New firms were established in various industries either by Australian or overseas capital in the post-war years. As far as we know it is possible to name only a few industries whose market structure became noticeably less concentrated during the period concerned. They are electric appliances and motor

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(1) The estimate is based on information given in Table 2.1 above and factory employment figures obtained from Commonwealth Bureau of Census and Statistics, Secondary Industries, op.cit., 1962.

vehicles manufacturing, part of machinery manufacturing, farm machinery manufacturing, sheet metal working, and joinery and furniture manufacturing. The relative paucity of observed examples of declining concentration should not simply be taken as an indicator of a general increase in concentration in post-war manufacturing. Before we can offer any definite picture of post-war changes in business concentration, we have to await further systematic and comprehensive investigations of the market structure of the various sectors of the industry.

Nevertheless, we should note that the preceding discussion provides us with very important information about Australian manufacturing industry. During the 18 years studied the market shares of the larger firms increased in a number of industries which were already very highly concentrated. As a result, market structure in these industries were transformed into 'near-monopoly or high-oligopoly'. In most of these cases the growth of large firms through mergers with rival firms was responsible for such changes in market structure. A similar tendency for concentration to increase in oligopolistic industries is also found by W.G. Shepherd in his study of changes in concentration in America for the period between 1947 and 1958.(1)

In addition it has already been noted that these highly concentrated Australian industries were, on average, the fast-growing sectors of manufacturing (Table 2.3). This fact itself has obvious significance for the study of industrial organization and of monopoly power and control. But for the theory of growth of firms it raises several other interesting questions. Have larger firms grown faster than the remaining firms in the industry and does this explain the increase in top-level concentration observed above? Have larger firms grown mainly

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(1) Among his selected 35 oligopolistic industries, which appear to include most of the industries in which the largest four firms accounted for more than 75% of total value added in 1947, concentration increased in 20 industries. W.G. Shepherd, 'Trends of Concentration in American Manufacturing Industries, 1947-1958', Review of Economics and Statistics, Vol. 46, (May 1964) pp.200-12.

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(1) pp.8-9.

(2) It is difficult to obtain a definition or measurement of the size of firms which serves every purpose. In a later part of the thesis several measurements of size of firms are examined in the light of their conceivable advantages and disadvantages for the present study.

inside their established market, or have they expanded into other fields by diversification of their products? Have larger firms grown much faster in highly concentrated industries than elsewhere? In other words, have larger firms grown faster not only because they are large, but also (or simply because) they have monopoly power or market dominance? These questions must be considered in the light of related analysis. This will be undertaken in the following section.

SECTION III: Size Distribution of our selected 402 Companies.

In every industrialized country economists have been interested in the identity of, and the power wielded by, the largest business enterprises. In spite of a relatively short industrial history Australia has also witnessed the development and dominance of a small number of very large firms. Why are they large? What is their actual economic power? In the preceding section we have seen that there are many instances of monopoly and near-monopoly in Australian manufacturing industries and also that in many cases the dominance of near-monopolists and high oligopolists has increased in the post-war years. But as well as being large with respect to particular production lines (i.e. industries) are these firms also large in the context of manufacturing as a whole and of the economy as a whole? In this section by studying our 402 selected companies we will attempt to outline the nature of the largest firms in Australia and this will serve as a prologue to our analysis of the growth of the firm.

First we will look at the size distribution of our companies. The '109' industries in Table 2.1 are now reclassified into '51' industries in the manner and for the reasons already mentioned in Chapter I.(1) During the period 1950-67, the 402 selected firms were engaged in all the '51' industries. The size of the companies has been measured in terms of the value of net capital assets.(2) Since our sample is restricted to

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(1) pp.8-9.

(2) It is difficult to obtain a definition or measurement of the size of firms which serves every purpose. In a later part of the thesis several measurements of size of firms are examined in the light of their conceivable advantages and disadvantages for the present study.

listed public companies it is obviously not representative of all enterprises engaged in each of the '51' industry groups.(1) The listed companies can be expected to represent a very high proportion of the large firms operating in each industry, but in many industries the pattern of the size distribution within our sample is unlikely to coincide with the size distribution of the whole population.

Because of the generally small number of listed companies operating in any one of the '51' industries we have reduced our original classifications to eight main groups - Cement and bricks; Chemicals; Iron and steel, etc.; Electrical engineering; Textiles, clothing and footwear; Saw mills, etc.; Food, tobacco and breweries; and Newspaper and periodicals.(2)

The percentage distribution of the size of our companies is given in diagrammatic form by Lorenz curves for the years 1950, 1958 and 1967 in Figures 2.1 to 2.9 below. The figures show the proportion of total business activity controlled by any given percentage of the number of largest firms. The percentage of the number of the largest firms is measured along the vertical axis and percentage of the value of their net capital assets is measured on the horizontal axis. If the Lorenz curve is a straight line it means that for any value of x the largest x per cent of firms control x per cent of the value of net capital assets and hence all the firms are of equal size. Thus the area between the diagonal and the actual curve may be taken as a measure of the degree of inequality in size.(3)

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(1) For the coverage of our sample firms in each manufacturing industry, see Appendix D at the end of the thesis.

(2) For details of the reclassification of the original'51'industries into these eight major industry groups, see Appendix C below.

(3) This area, which is measured as a proportion of the total triangle beneath the diagonal, is known as the 'Gini coefficient'. For a detailed discussion of Lorenz curves as a measurement of 'inequality' of sizes of firms, see Rosenbluth, op.cit.

Cement and Bricks

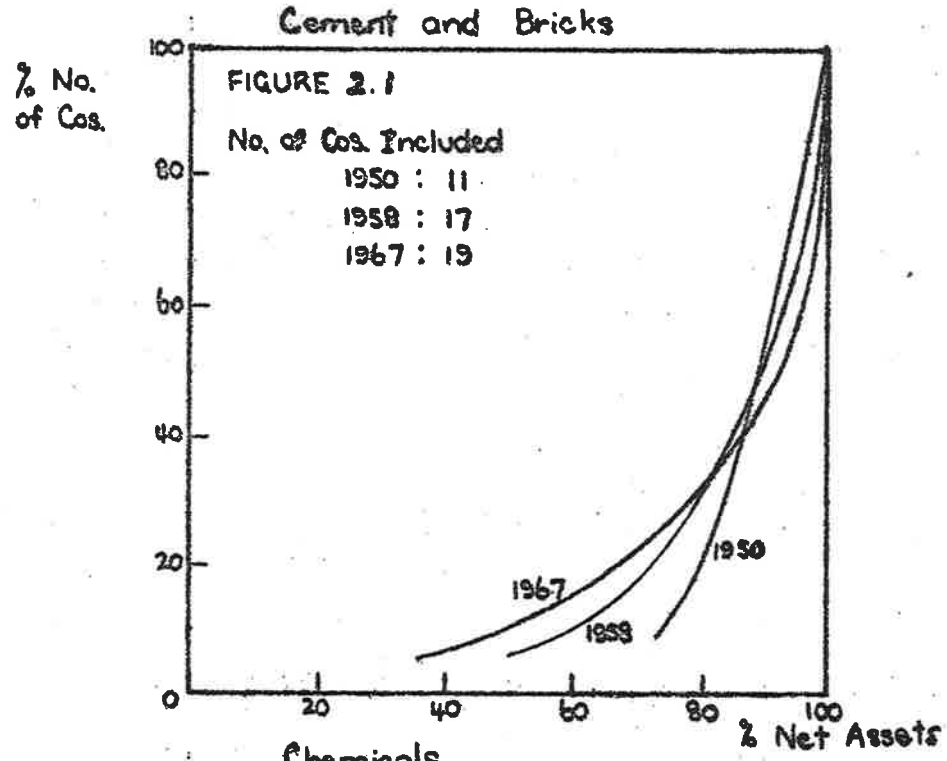


FIGURE 2.1

No. of Cos. Included
1950 : 11
1958 : 17
1967 : 19

Chemicals

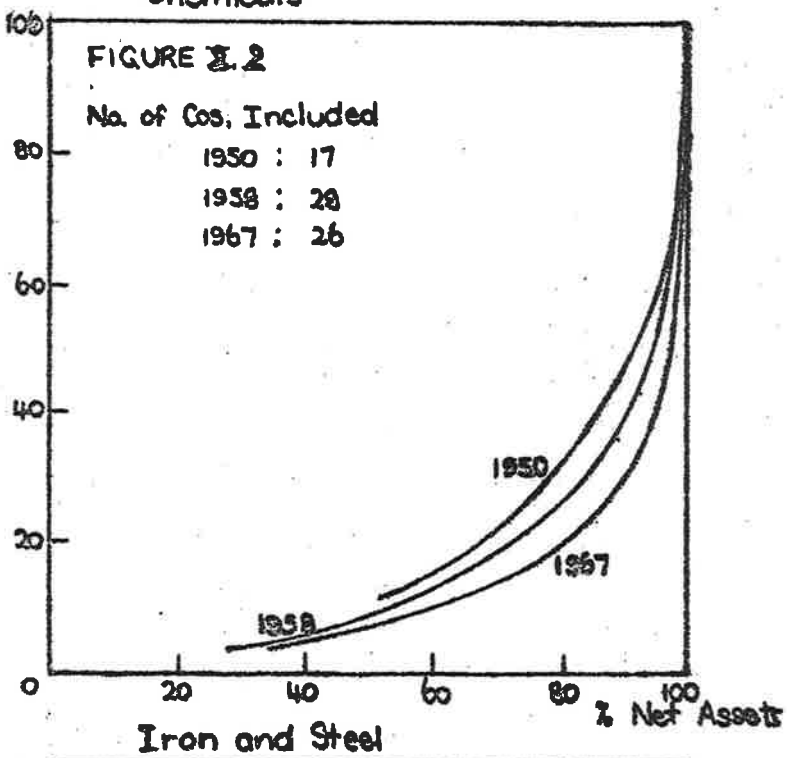


FIGURE 2.2

No. of Cos. Included
1950 : 17
1958 : 28
1967 : 26

Iron and Steel

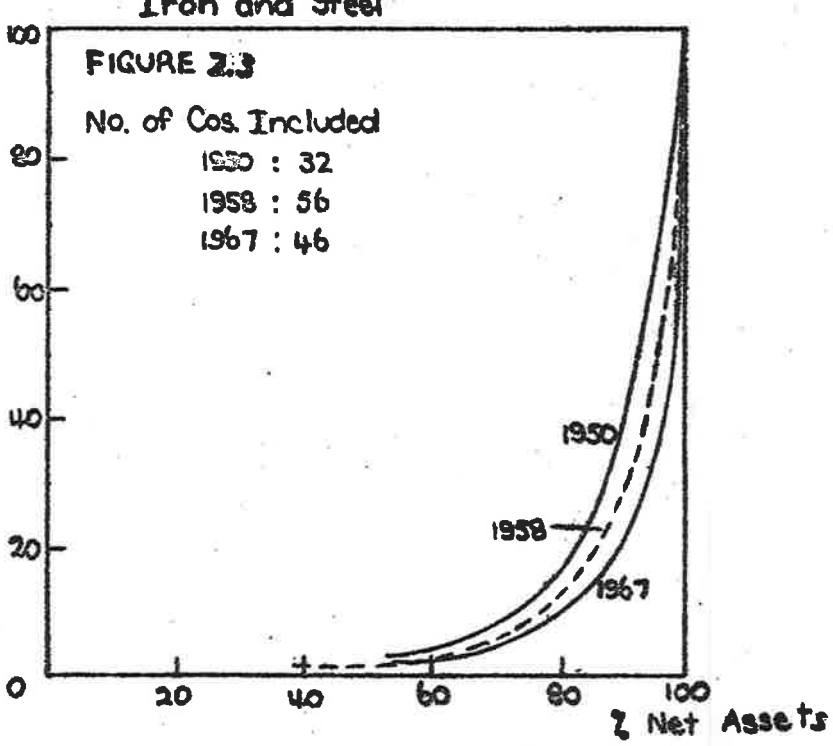


FIGURE 2.3

No. of Cos. Included
1950 : 32
1958 : 56
1967 : 46

Electrical Engineering

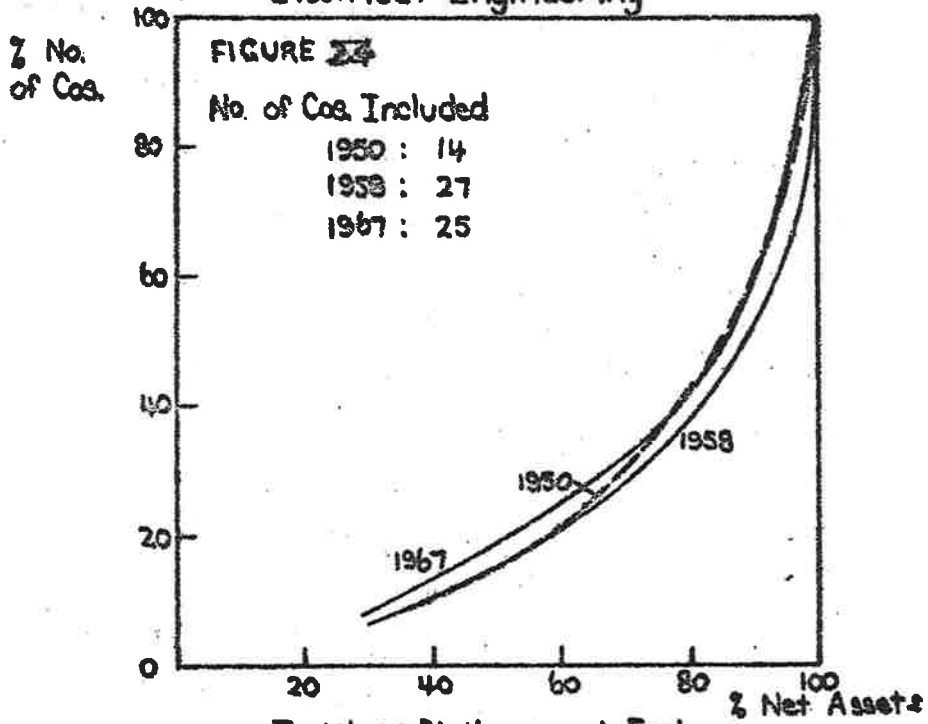


FIGURE 24

No. of Cos. Included
1950 : 14
1958 : 27
1967 : 25

Textiles, Clothing and Footwear

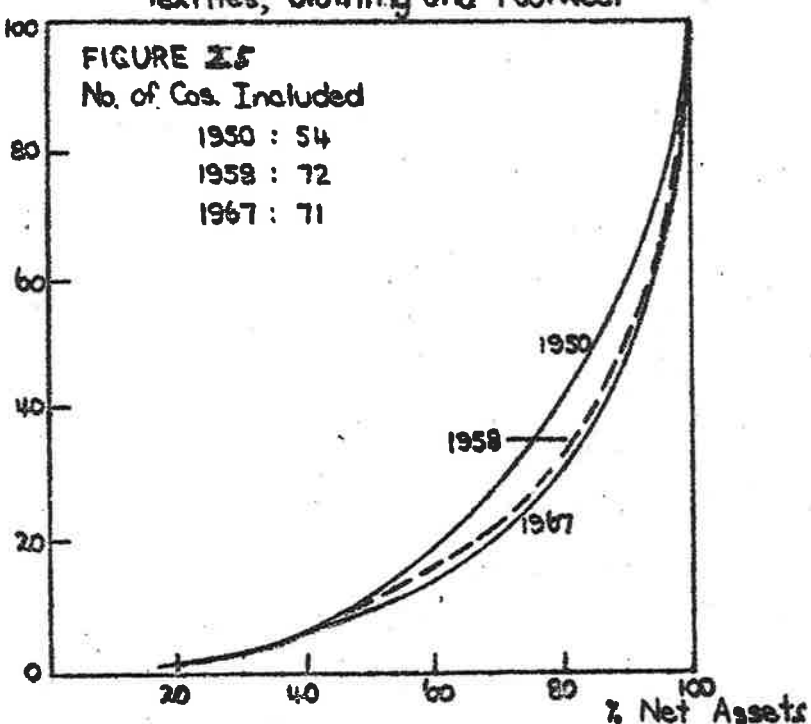


FIGURE 25

No. of Cos. Included
1950 : 54
1958 : 72
1967 : 71

Saw-mills etc.

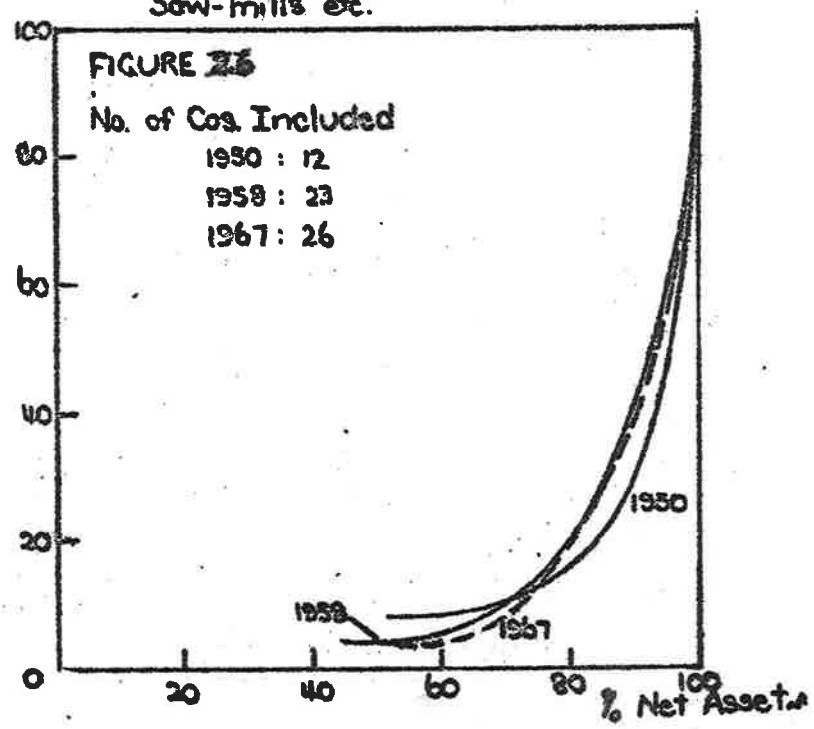
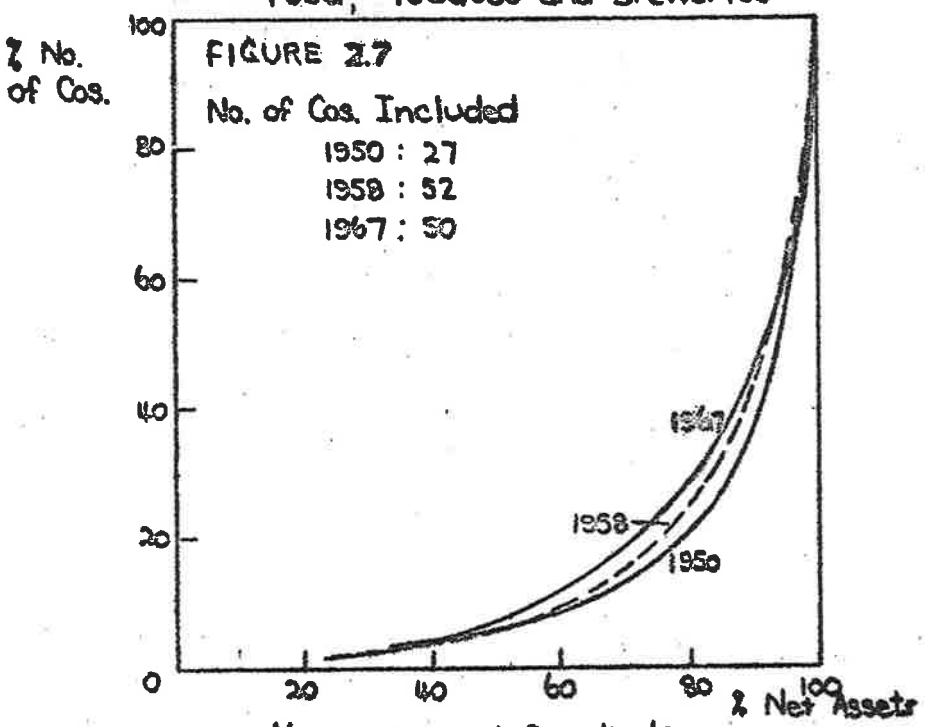


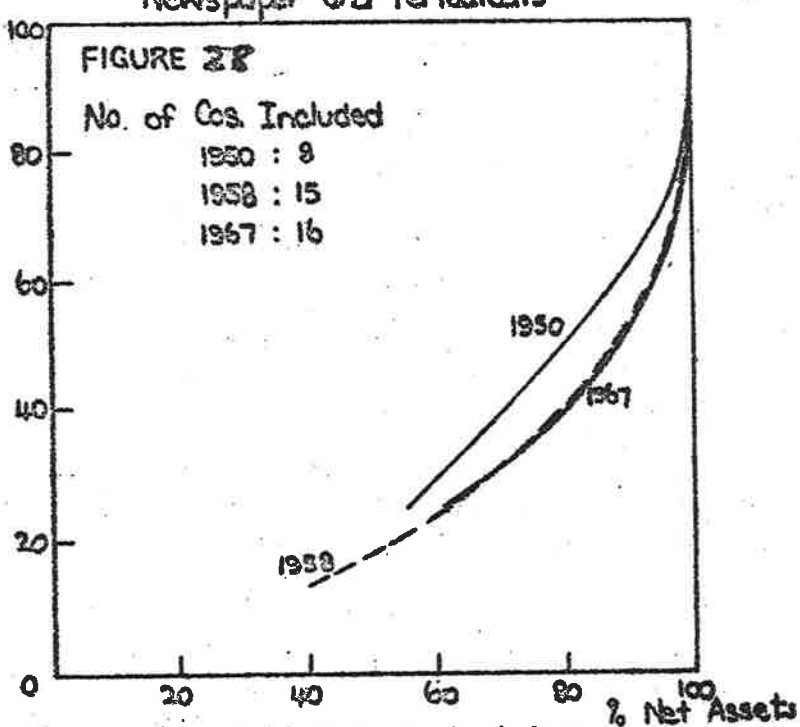
FIGURE 26

No. of Cos. Included
1950 : 12
1958 : 23
1967 : 26

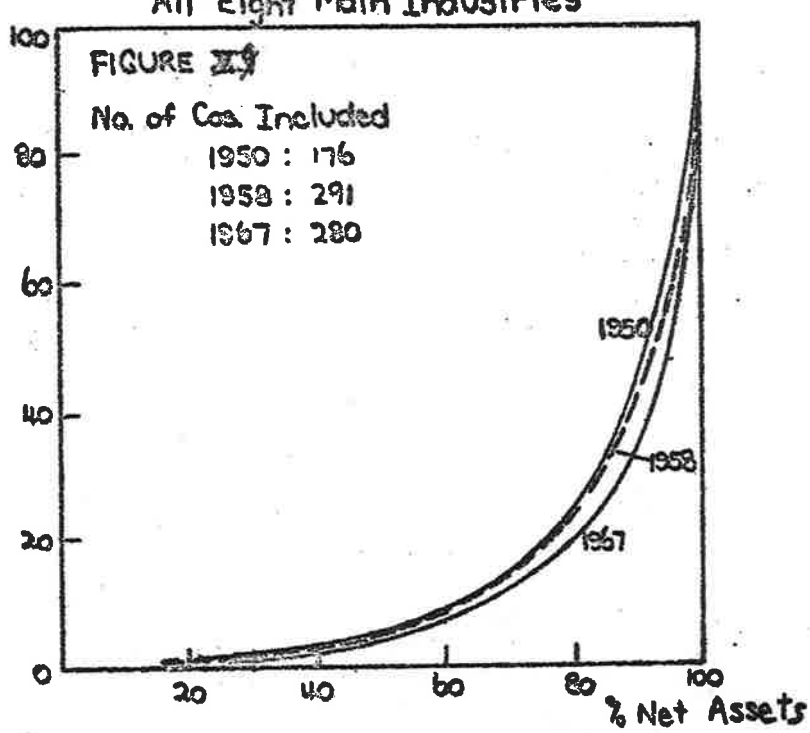
Food, Tobacco and Breweries



Newspaper and Periodicals



All Eight Main Industries



In all those years studied the size distribution is extremely unequal in each of the eight main industry groups. Inequality is particularly striking in Chemicals, Iron and steel, and Saw mills etc., where in 1967, for example, more than two thirds of each industry's total net capital assets were held by less than 10 per cent of the number of companies in the industry. In the same year the largest firm held more than one third of the chemical industry's total net capital assets, and the proportion exceeded one half in the other two industry groups. This is due to the inclusion of one of the nation's giant firms - Imperial Chemicals Industries of Australia and New Zealand (I.C.I.), the Broken Hill Pty. Co. (B.H.P.) and Australian Paper Manufacturers - in each of the three groups.

Assuming for a moment that the expansion of the business activities of each of our firms has largely occurred <u>within</u> the particular industrial group in which we have classified it (i.e., no expansion into the other seven major groups) we can see in the Figures that larger firms grew faster over the period 1950-67 in most of the groups.(1) The bottom portion of the curve which represents the share of the largest firms shifted left in Chemicals, Iron and steel, Textiles, etc., Saw-mills, Newspaper and periodicals and the aggregated All-industries groups.

The concept of 'inequality in the size distribution of firms' is technically distinct from 'business concentration', and also from the 'actual size'. Take for example an industry which contains only two firms. The business concentration in this industry is obviously high (duopoly), but if these two firms were of equal size a Lorenz curve would indicate perfect equality. Conversely, in another example where there are several firms of various sizes, the size distribution may become more equal while business concentration measured by the Lorenz curve increases if the smaller firms leave the industry. Also the actual absolute size of firms is

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(1) The direction of the expansion of the business activities of our firm is discussed in Chapter V.

completely unrelated to either of the above two concepts. Yet despite distinct differences between these three concepts, a study of our 402 selected firms and the observations in the preceding section lead us to believe that in Australian manufacturing industries 'inequality in the size distribution of firms', 'business concentration' and 'absolute size of firms' appear to have developed together hand in hand.

In the preceding section we identified the varying degrees of business concentration of our original 109 industries in which our '51' reclassified industries were included and throughout which our 402 sample firms are distributed. Now we reclassify the listed companies according to different types of market concentration - monopolists, duopolists, oligopolists etc. - for the years 1950, 1958 and 1967. In table 2.5 below we also show the average size (in terms of net capital assets) of these companies in each concentration group. From this Table we can see the outstanding large absolute size of monopolists and high oligopolists (those classified into groups 1 and 2 in Table 2.5).(1) There are of course several examples of small-sized monopolists or virtual monopolists who specialize in fields such as the production of razor blades, sewing machines, artificial flowers, matches and gelatine, but they represent only a minor part of manufacturing activity. This identity of large absolute size and market dominance in Australian manufacturing industry should be noted with special emphasis and, if we consider the much smaller coverage in our sample of firms engaged in less concentrated industries, i.e., where the listed companies form a much smaller proportion of the total, the relationship becomes even more pronounced than Table 2.5 indicates. The association of absolute size and monopolistic control in Australia does not correspond with the evidence so far available for overseas manufacturing industry. In the United States of America, the United Kingdom and Japan, for example, it is observed that most of the big firms operate in moderate

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(1) Since the firms are classified into each concentration group according to their major products, a part of their net capital assets may be engaged in other activities, but large absolute size of a monopolistic or high-oligopolistic firm may be acquired within its primary industry as well as by diversification into other industries.

and low-oligopolistic industries.(1) They attained their large size either through diversification of product-lines into several fields, or through wide-ranging financial empire-building, or both, but very seldom through establishing dominance in a single market. Foreign giants may have varying degrees of market control in a series of markets, but their large size is the result of a conglomeration of business activities. These types of overseas largest firms, which are usually loosely termed 'conglomerate firms',(2) would therefore be classified into our groups 3 and 4 in Table 2.5.

In contrast, large size in Australia is usually a reflection of market dominance. Although there has recently been a considerable development of financial holding companies and an increase in importance of diversification of large firms' activities,(3) most of the Australian industrial giants have expanded through the consolidation of their dominance in expanding markets and their bigness and monopolistic power have fortified each other. This argument can be supported by the particular importance of economies of scale in many Australian markets.(4) In his study on barriers to entry, Bain suggests that substantial technical economies of large scale of operation provides one of the most effective

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(1) See for example, C.D. Edwards, 'Conglomerate Bigness as a Source of Power', in Business Concentration and Price Policy, op.cit., pp.331-59, M. Gort, Diversification and Integration in American Industry, National Bureau of Economic Research, (Princeton Univ. Press, 1962), J.C. Narver, Conglomerate Mergers and Market Competition, (Berkeley: Univ. of California, 1967) and Japan Fair Trade Commission, Industrial Concentration in Japan, (Tokyo: 1964), pp.53-7.

(2) Following Edwards we are using the term 'conglomerate' firms to refer to larger corporations whose business activities are diversified into various markets and industries. Recently, however, the same term has often been used to refer to a firm which invests in unrelated branches of manufacturing and other fields so as to pursue higher profit (dividend) by manipulating its liquid capital in a similar manner to speculating in the capital market. Examples of 'conglomerate' in the latter sense are firms such as International Telephone and Telegraph Corporation in the U.S.A. and the Rank Organization in the U.K. Edwards, 'Conglomerate Bigness as a Source of Power', ibid., and Australian Financial Review, 23 Oct. 1969.

(3) See Chapter V below.

(4) Karmel and Brunt, op.cit., pp.54-65.

Table 2.5

Average Size of Net Capital Assets of Our Companies by Concentration Group: 1950, 1958 and 1967

Concentration group[1]	1950		1958		1967	
	No. of Companies[2]	Average Net Assets (£'000)	No. of Companies[2]	Average Net Assets (£'000)	No. of Companies[2]	Average Net Assets (£'000)
1 Monopolistic and oligopolistic industries	12	8,076	15	18,468	13	56,163
2 High-oligopolistic industries	35	2,136	49	5,549	46	14,273
3 Moderate-oligopolistic industries	32	904	55	1,923	53	5,375
4 Low-oligopolistic industries	28	1,321	57	2,629	53	6,999
5 Unconcentrated industries	42	781	65	1,670	60	3,504
6 Competitive industries	8	560	17	1,053	17	3,983
7 High-competitive industries	19	374	33	733	38	1,017
Total	176	1,602	291	3,282	280	8,426

Notes: (1) See Table 2.2.

(2) The number of the firms included differ from year to year because of the 'Discontinued' and 'Newly-entered' firms.

non-monopolistic restrictions on the entry of new firms.(1) In the absence of artificial aid such as tariff protection only a limited number of firms can operate with profit under decreasing costs. Once a few (often the first established) firms have reached the size of optimal scale where they can obtain advantages of economies of large scale production, few other new firms can enter the industry on a competitive basis because newcomers are forced to operate on the minimum scale of production and thus at a higher cost. Unless the price set by the established firms in the industry is high enough to provide profit for potential new competitors they would not enter. As a result business concentration would be stable in those markets and, ceteris paribus, the greater the economies of scale and the smaller the market the greater will be the barriers to entry. Supporting evidence for such generalizations about the process of growth of big business in this country may be found in several studies of company histories. These include histories of B.H.P., the Colonial Sugar Refining Co. (C.S.R.) and General Motors-Holden's (G.M.H.) which came to the forefront of manufacturing at an early date and have grown largely with their markets. They have established their market dominance in the industries through the process of their growth.(2)

The dominant position of a relatively small number of large firms in manufacturing and in the economy as a whole has been identified in almost every industrialized nation. Several scholars have offered explanations of the causes of the dominance of big business - which we may loosely term 'concentration of economic power' - and the process by which it emerges.(3) One hypothesis suggests the importance of a 'headstart'

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(1) J.S. Bain, Barriers to New Competition, (Cambridge, Mass: Harvard Univ. Press, 1956) see in particular Chapters 1-6.

(2) N.R. Wills, 'The Basic Iron and Steel Industry', D.J. Stalley, 'The Sugar Industry', and G. Maxcy 'The Motor Industry' in Hunter (ed.) The Economics of Australian Industry, op.cit., pp.215-46, 357-93, and 494-538.

(3) Penrose, The Theory of the Growth of the Firm, op.cit., A.D.H. Kaplan, Big Enterprise in a Competitive System (Washington D.C.: The Brooking Institution, 1959), J.K. Galbraith, The New Industrial State (London: Hamish Hamilton, 1967).

and emphasizes certain advantages which accrue to firms established at an early stage in industries which enable them to maintain their position and grow at the expense of later entrants.(1) Penrose stresses the importance of absolute size as the great prerequisite for faster growth.(2)

In fact we have seen that most of the Australian leading firms satisfy the three qualifications of 'large absolute size', 'market dominance' and 'early establishment'.(3) But what are the most important factors which provide firms with an advantageous position (business power) for pursuing profitability and expansion in Australia? Does business power stem from an element of market dominance as traditional writers suggest, or is it, as Penrose argues, largely a product of absolute size originally unassociated with monopolistic control? If absolute size brings business power, does it reflect economic efficiency or search for efficiency? These problems will be examined in the following chapters.

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(1) Karmel and Brunt, op.cit., p.89.

(2) E.T. Penrose, 'Towards a Theory of Industrial Concentration', Economic Record, Vol.32 (May 1956), pp.64-77 and The Theory of the Growth of the Firm, op.cit.

(3) There are of course several examples of leading firms which have been formed in the post-war merger movements, while others have recently been created by overseas parent firms.

CHAPTER III

PROFITABILITY

The object of this chapter is to examine several factors which conceivably determine the profitability of firms. In the first place we will ask to what extent is the profitability of firms related to the size of firms. This question implies an inquiry of whether there is an 'optimal size' of firms in terms of obtaining maximum profitability.(1) We will see that size has only a small influence on the profitability of firms, and our next question will be to ask what are the other important factors which systematically influence the profitability of firms. We will ask which firms are the most profitable ones and ascertain over what time periods they have maintained their high level of return. Firms with higher profitability will be examined in relation to size, industry, the market structure in which they operate and the changing background of general economic activity over time.

The implications of our findings in this chapter will be important for our later study of growth of firms. One of the hypotheses which we will examine in a subsequent part of the thesis is the relationship between profitability and growth of firms. Any new observations and discoveries in this chapter will therefore be referred to in detail in our later analysis of the growth behavior of firms.

Several studies testing the profitability and size relationships of firms have already been undertaken - mainly in the United States of America and Britain. Yet little agreement has been reached so far among the researchers and there even seems to be some confusion as to what the study of profitability can and cannot prove.

Thus Section I consists of a very brief survey of previous work in the field which will serve as an introduction to our discussion in the subsequent three sections. In Section II the relationship between size

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(1) For the concept and the measurement of profitability of firms, see the Appendix at the end of this chapter.

and profitability of our selected 402 Australian public companies will be examined. In Section III the nature of profitable - and unprofitable - firms will be examined. In Section IV, the performance of highly profitable firms in our sample will be analysed in relation to the market structure in which they find themselves.

SECTION I: Preceding Studies

The profitability of firms has been analysed by many economists. The hypotheses advanced have been varied, but the investigations have mainly concentrated on one of the following three aspects:-

i) the determination of the relative efficiency of firms of various sizes (often in relation to economies of scale),

ii) the relative ability of firms to expand through retained earnings, and

iii) the use of profit ratios as a measure of monopoly power.

The difference in profit ratios of various sizes of firms has frequently been used as a measure of the efficiency of firms of different sizes. Here it should be noted exactly what is meant by 'efficiency', for this term has been used in quite different ways in testing the hypothesis of profitability and size relationships. The most efficient plant or firm is the one which has the ability to produce (and distribute) goods or services at the lowest possible cost. This is the most widely accepted definition of 'efficiency'. In practice, however, it proves difficult to apply. If firms of different sizes produce different ranges of product mixes, they will have different costs and revenues. In addition, variables such as geographical location, wage rates, prices of plant and other fixed assets at the time of construction, and excess capacity, will inter alia. affect the cost of production of a firm in both the short and long run. Thus the actually observed profit ratios do not provide any accurate information about the level of cost and therefore about the level of efficiency. Furthermore, if higher profitability of a particular firm is simply a result of its market control, then obviously it tells little about its production efficiency. The profitability of a firm thus indicates the

degree to which the firm has been able to compete successfully under given conditions of competition existing in an industry. It may therefore indicate the efficiency of a firm from the point of view of a shareholder. This approach obviously gives to efficiency a different meaning from that related entirely to cost.

The second broad method of approach has suggested the distribution of profit rates by size of firms as an index of the relative ability of firms of various sizes to grow. The hypothesis of a relationship between rate of profit and rate of growth of firms has been developed and empirically tested by several economists.(1) This profitability-growth hypothesis is based on the view that retained earnings are generally the most important source of capital funds for the expansion of firms even in cases where external sources of funds, such as money raised from capital market and the bank overdraft are of relatively easy access. In addition profitability may influence to some extent the market value of issued capital and determine whether external funds are available to each firm.(2) If we can justify this profitability-growth hypothesis, we may indicate which size-class of firms are the most profitable and thus the most likely to grow. This argument may further lead us to test another hypothesis about a trend in business concentration over time, that is, the often suggested difference in the rate of profit and therefore the rate of growth between largest firms and small ones will give an indication of the changes in business concentration in an industry.(3)

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(1) See for example, R. Marris, The Economic Theory of 'Managerial' Capitalism, op.cit., and 'Income Policy and the Rate of Profit in Industry', Reprint Series, No. 238, University of Cambridge, Department of Applied Economics, (1965), J.R. Meyer and E. Kuh, The Investment Decision, (Cambridge, Mass.: Harvard Univ. Press, 1957), and J.E.S. Parker, 'Profitability and Growth of British Industrial Firms', Manchester School, Vol. 32, (May 1964), pp.113-29. The relationship between these two variables is examined in Chapter V below.

(2) See for example, Meyer and Kuh, ibid., p.176.

(3) Adelman suggested that business concentration decreased in the war year of 1942. His argument is based on evidence which showed a definite inverse relation between post tax profit rate and size of firms. From this he deduced that the small corporations had grown faster from retained earnings than larger ones. M.A. Adelman, 'The Measurement of Industrial Concentration', Review of Economics and Statistics (1951), reprinted in Readings in Industrial Organization and Public Policy, (Chicago: R.D. Irwin, 1958), pp.20-1.

Thirdly, the rate of profit is also frequently used as a measure of the monopoly power of firms. Profitability is examined in industries of different degrees of business concentration, or the rate of profit of the largest firms in an industry or economy is discussed in relation to the economic power which those large corporations are expected to hold. Although levels of profitability measured by accounting data are determined by many factors other than market structure, the discovery of a positive association between high profit rates and high seller concentration offers empirical support for the hypothesis of a close relationship between the market structure and the market performance of firms. If large differences of average profit rate among various industries are persistently observed over a period, one would suspect that there were some 'barriers to new entry' into some industries which impede the mobility of capital and may result in mis-allocation of resources.(1)

One of the first and most comprehensive studies of profitability of firms of various size groups was conducted by W.L. Crum in 1939.(2) His statistical data were based on American corporate income tax return figures for the years 1931 to 1936 inclusive. He measured firms' profitability in each industrial group by the annual rate of return after tax per unit of net worth and discovered that the largest companies in general were the most profitable.(3) This conclusion, however, was modified when deficit - firms (firms which made either no profit or a loss) were excluded, and the rate of return of income-firms (profitable firms) was found to be inversely correlated with size.(4)

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(1) Several studies have been developed in this direction. See, for example, J.S. Bain, 'Relation of Profit Rate to Industry Concentration: American Manufacturing, 1936-40', op.cit., pp.293-323, and H.M. Mann, 'Seller Concentration, Barriers to Entry, and Rates of Return in Thirty Industries, 1950-60'. Review of Economics and Statistics, Vol. 48, (August 1966), p.296-307.

(2) W.L. Crum, Corporate Size and Earning Power, (Cambridge, Mass.: Harvard Univ. Press, 1939).

(3) Ibid., pp.28-9 and 54.

(4) Loc.cit. The term 'income corporations' and 'deficit-corporations' was first used by J. Steindl in his Small and Big Business: Economic Problems of the Size of Firms, (Oxford: Basil Blackwell, 1947).

Since Crum's investigation was based largely on the extremely unusual years of depression several economists cast doubt upon the general conclusions of this work and this encouraged further inquiries into the relationship between size and profitability of firms. One of these was a study by J.L. McConell who used pre-tax profit data of selected American companies for the years 1939-42 inclusive and discovered that the rate of return of medium-sized firms was higher than that of largest firms.(1) McConell's findings were further developed by R.C. Osborn for the years 1937 to 1946.(2) He observed a declining relationship between profitability and size of firms for the period between 1937 and 1939, but this relationship was found to be less apparent in the years 1940 to 1946 inclusive. Profitability among income firms tended, on the whole, to decline at first with increasing firm size, then to rise and finally to decline again. In every instance, however, the profit rates of the largest firms were below those of the medium and smaller firms.

A similar overall declining relationship between profitability and size of firms was also observed by H.O. Stekler who employed data of pre-tax profit per total employed capital for the 1947-51 period in the U.S.A.(3) This inverse relationship was observed both for aggregated entire manufacturing groups and two digit industrial groups such as 'food and beverages', 'textiles' and 'stone, clay and glass'.(4)

More recent studies, however, have produced much more conflicting results. A. Singh and G. Whittington published in 1968 part of the preliminary results of their survey of growth, profitability and valuation

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(1) J.L. McConell, 'Corporate Earnings by Size of Firm', and '1942 Corporate Profits by Size of Firm' in Survey of Current Business, (May 1945), pp.6-12 and (January 1946), pp.10-16 and 20. In relation to the above articles, see also, Baumol, Business Behaviour Value and Growth, op.cit., p.42 footnote 9.

(2) R.C. Osborn, 'Effects of Corporate Size on Efficiency and Profitability', Bureau of Economic and Business Research, Bulletin Series No. 72, (1950).

(3) H.O. Stekler, Profitability and Size of Firm, (Berkeley: Univ. of California, 1963.).

(4) Ibid., see in particular p.75.

of British manufacturing firms.(1) The survey covers 364 quoted companies in four selected industries for the period between 1948 and 1960. Based on both pre- and post-tax profit rates on equity assets and net assets, the study indicates that, on the whole, there is an inverse relationship between profitability and size of firms. But the study failed to find any statistically significant (at the 5 per cent level) difference in average profitability of firms in various size classes. Thus it was found that there is no linear relationship of any importance between size and profitability.(2) However, if deficit firms are excluded from the population, a weak inverse linear relationship is observed between size and profitability.

In their study of 186 selected British companies engaged in manufacturing, distribution and mining activities for the period between 1954 and 1963, J.M. Samuels and D.J. Smyth observed a strong (statistically significant) inverse relationship between size and profitability of firms. Size was measured by net assets, and profitability was measured by the ratio of pre-tax profit to net assets.(3) Such an inverse association was found for each of the ten years studied as well as for the average of the whole period. The population included both income and deficit firms.

Recent study of American companies, however, demonstrates an opposite relationship between these two factors. M. Hall and L. Weiss conducted a survey of selected large manufacturing firms in America for the period between 1956 and 1962.(4) The principal purpose of the study was to test empirically Baumol's theoretical proposition which suggests that large enterprises should obtain higher rates of return than smaller ones.(5)

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(1) A. Singh and G. Whittington in collaboration with H.T. Burley. Growth, Profitability and Valuation, (Cambridge Univ. Press, 1968).

(2) Ibid., Chapter 6.

(3) J.M. Samuels and D.J. Smyth, 'Profitability, Variability of Profits and Firm Size', Economica, Vol. 35, (May 1968), pp.127-39.

(4) M. Hall and L. Weiss, 'Firm Size and Profitability', The Review of Economics and Statistics, Vol. 49, (August 1967), pp.319-31.

(5) Baumol, op.cit., Chapter 5.

The study includes 467 firms which were selected from the 500 largest manufacturing firms in the U.S.A. in the period studied so that the population consists of only those firms which were larger than the estimated minimum efficient scale in an industry. Profitability was measured by ratios of post-tax return to both equity and to total assets. Not only the association of size and profitability of firms, but also the effect of various types of market structure on industries' average profit rate was examined in order to measure the extent of 'monopoly profits'. In brief, the main conclusion was that large size does tend to result in higher profitability and the size difference of firms has greater effect on firms' actual profit rate than market power.(1) This conclusion is very striking when compared with the previous observations of Bain and Mann who confirmed a relatively strong association between high profit and high market concentration.(2) The Hall-Weiss finding therefore raises the important question of whether the capital requirements barrier is more important than market control as a determinant of profitability of firms. We will discuss this matter later in the Australian context.

SECTION II: The Profitability and Size of our 402 Firms

Economic theory predicts that in the long-run large enterprises usually tend to obtain higher rates of return than small enterprises. The logic of this theoretical proposition may be summarized roughly in terms of three factors which influence the relative profitability of firms of different sizes. These are i) economies of scale, ii) market factors such as monopoly power, and iii) financial characteristics such as the conceivable advantages and disadvantages in raising capital funds.

First, it is not normally expected that small-scale firms would report higher rates of profit than larger firms because although smaller-scale plants are possibilities available to larger firms, larger scale

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(1) Baumol, ibid., p.329.

(2) See footnote (1) on p.43 above.

plants are not feasible for smaller firms.(1) Secondly, since large firms generally enjoy some market control, size offers them the advantage of monopolistic exploitation to varying degrees.(2) Thirdly, it has often been observed that the long-term capital market is open to small firms only at a prohibitive cost which often precludes them from entering into capital intensive fields. Thus again large firms still have open to them all of the options of smaller firms and, in addition, are protected by these capital requirement barriers.(3)

How plausible are these theoretical predictions in the Australian case? In this section we will examine the differences in profitability of our 402 firms in association with their size. The size of firms is measured by book value of net asset (share capital, reserves and long-term liabilities) shown in balance sheet reports. The profitability of the firms is measured by average rate of return after tax on net assets.(4)

The basic data of our study, which were obtained from companies' balance sheet reports, have several possible defects for the present purpose of estimating differences in profitability among firms. These suspected defects in the profit data may tend to distort the real extent of profitability differences among firms. Some of the most important aspects may be summed up as follows:-

First, profitable firms may tend to adopt accounting practices which understate their profit for tax purposes as well as for public relations reasons. This is particularly important in the case of large profitable firms which generally feel most vulnerable to public opinion concerning so-called 'monopoly profits'. Also, since undistributed

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(1) For further detailed examination of factors which give rise to economies of scale, see for example J. Steindl, op.cit., Chapter II, and S. Florence, The Logic of British and American Industry, (London: Routledge & Kegan Paul, 1953), Chapter II.

(2) See, for example, Bain, op.cit.

(3) Baumol, op.cit., Chapter 5.

(4) Our reasons for choosing post-tax net profit per net assets as the measure of profitability of our 402 firms are given in the Appendix to this Chapter.

profits are the most important capital source for expansion of a firm,[1] it is usually expected that managers of profitable firms seek to retain profits rather than pay high dividends. Therefore they may understate actual profits for the purpose of disguising the true situation from shareholders.

Second, conservatism in accounting is also found in the valuation of assets so that in effect items like shareholders' funds, fixed assets, 'stock and debtors' may be undervalued while, on the other hand, 'creditors and other provisions' may be overvalued. The degree of the distortion of balance sheet figures from actual ones differs from firm to firm in accordance with their individual accounting conventions and managerial practices.[2]

Third, in addition to the intended difference between the actual current values of assets (and liabilities) and those shown in the balance sheet, there are differences which stem mainly from price fluctuations. In a period of rising prices fixed assets which have been acquired over a period of years and which are usually valued at original cost (historical cost) in balance sheets will be understated in terms of current prices. This is also true of the value of stock holdings.[3] It is normally expected that in a period of rapid inflation managements would bring their book values of assets into line with current prices by revaluing the assets at some time. However, there is a lag in their reaction, and the length of such lags differs from firm to firm. Some firms often revalue a part or all of their assets to show them at current value, some firms do so occasionally, and some other firms depreciate assets as fast as possible and never revalue. Generally speaking, an industry and a firm that has relatively old assets will have a relatively smaller asset-value base in a period of inflation and thus a relatively higher rate of return.

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(1) This aspect is extensively discussed in Chapter 5.

(2) See, for example, R.L. Mathews and J. McB. Grant, Inflation and Company Finance (Sydney:Law Book Co. of Australia,1958),second ed., Chapters VII and X.

(3) Ibid.

Our selected 402 companies include various sized firms of varying degrees of profitability. Some firms are very old and have been listed on the Sydney Stock Exchange since the beginning of the century, while others were established in the early 1960's so that the age structure of assets ranges widely.(1) In addition, the period of our study was continuously inflationary and the value of assets rose in every year relative to their original value.(2) Considering these aspects there is no doubt that changing price levels distorted some of the book values of assets of our companies, and it may also be expected that accounting conventions employed differ as between the 402 companies and either under- or overstate their profitabilities. Unfortunately, given the limitations of available information, there seems to be no complete way round these problems.(3)

However, in order to minimise the conceivable errors connected with the third aspect mentioned above (i.e., possible overstatement of profit ratios on net assets by undervaluing the assets - the denominator of the ratios), we have examined each of our 402 firms on the following four bases so as to select from the total population a group of firms whose book values of net assets appear to be relatively more reliable.

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(1) Out of the grand total of 402, the date of incorporation as public companies is available for 294 firms. Seventy-three of them were established before 1930, of which 19 firms were formed before 1910. On the other hand 120 firms were incorporated as public companies in the 50's and 60's.

(2) We calculated the price index of fixed capital for private activities (other than housing purposes) from National Accounts data as shown in the table below:-

Price index of fixed capital for private activities
(1950-51 = 100.0)

1950-1	100.0
1955-6	141.3
1960-1	161.8
1964-5	171.0

Source: Commonwealth Bureau of Census and Statistics, Australian National Accounts, National Income and Expenditure, 1948-49 to 1964-65, and 1953-55 to 1965-66.

(3) The effects of inflation on the profitability of firms is most extensively discussed by R. Mathews and J. McB. Grant. They show the causes and the effect of the divergence between the accounting profit and current income during a period of rising prices and suggest measures to counteract the accounting effects of inflation. Mathews and Grant, op.cit.

1. Companies with new assets - they include firms which were formed after 1956 and firms a large part of the assets of which were acquired after 1956. The year 1956 is chosen because the most rapid post-war inflationary trend appeared to have ceased by the end of this year (see footnote (2) on p.49 above).
2. Companies which have revalued all or a large part of their assets at least once since 1956.
3. Companies which were first listed on the Sydney Stock Exchange after 1956. The assumption here is that when a firm requests and obtains quotation on the Exchange it may usually be expected to re-value its assets in line with their current values so as to improve its asset backing ratios as well as to minimize the danger of unexpected take-over bids. Companies which were taken over by other firms within five years after their first quotation in the Exchange are excluded.(1)
4. Companies which have issued at least once since 1956 a relatively large sum of new share, i.e., equal to more than two-thirds of the book value of already issued shares. The reasoning here is the same as that in (3) above concerning asset-backing ratios and the expected danger of take-over bids.

Of the grand total of 402 firms, 330 fall into one of these four categories. The following examination of the differences in the profitability of firms will look at both this group of 330 firms and the total population. It should be noted, however, that these 330 firms are not completely free from possible distortion of real profit ratios. In particular it must be borne in mind that we have not corrected the possible errors which may stem from the first two factors outlined on pages 47 and 48 above.

The differences in average post-tax profit rate per net asset between firms in various size groups were estimated for the three sub-

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(1) Such firms often obtain citation in the list of public companies so as to find suitable buyers for them. In that case, their valuation of assets are likely to be understated.

periods 1950-5, 1956-61, and 1962-7, as well as for the whole period of 1950-67. The firms are classified into 13 size groups according to their value of net assets in the initial year of each period studied.

Rank correlation coefficients were calculated between average profit rates on net assets and size-groups. These rank correlation coefficients are shown in Tables 3.1 and 3.2. Almost all are negative. In Table 3.1, which shows the profitability and size relations for the 'all-industry' group, ten out of 12 relations are observed to be negative and all but one of these inverse relations are statistically significant. In Table 3.2, which shows the relationship in eight major industrial groups, there are 81 negative relations out of the total of 96, and 48 of these are statistically significant (significant at less than 10 per cent level).(1) Although the degree of significance differs between industries and over time, it should be noted that our results as a whole indicate that profit rates tend to decrease with the size of firm. A particularly strong inverse relation is seen over the long period 1950-67 for the 'all-industry' group as well as for the eight major industrial groups. The negative correlation of profitability and size is more marked in our '330-firm' group than in the 'all company' group, and this strengthens the overall result because the former is based on more reliable information. It is also found that the inverse association is more pronounced in the 'income-firm' group, which excludes firms that failed to make profit in one of the years studied, than in the total population. This appears to indicate that the rate of profit is differently correlated with firm size among deficit-firms than among income-firms. This is shown and analysed in the next section of this chapter.

Closer study of Tables 3.1 and 3.2 gives us further information about size-profitability associations. Both tables show that the observed inverse relationship between profitability and size of firms is relatively weak in the sub-period 1962-67. Positive observations, though not many,

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(1) The results of the t-test are shown in both Tables 3.1 and 3.2 by the numbers of asterisks indicating different degrees of significance.

are mainly concentrated in this period. In order to examine further the differences in the degree of profitability-size associations between different years, the relationships are estimated for each year of the period studied and the rank correlation coefficients are shown in Table 3.3. In the '330-firm' group which shows better correlation results than the 'all-firm' group, there are seven positive and 11 negative relations. Of the latter only six (1950, 51, 52, 54, 59 and 63) are significant at, or less than, the 10 per cent level indicating that there is little correlation between firms' size and their rate of profit on a single year basis. Positive relations are observed in 1957-59 and 1964-67 in the '330-firm' group, and in 1953, 1957-59, 1962-63, and 1965-67 in the 'all-firm' group. It is interesting to note that a) all the post-war recession periods are included in the latter nine years, and b) the majority of these positive correlations are concentrated in the period from 1962 onwards when import licensing policies were removed from most manufacturing fields and entrepreneurs began facing increased overseas competition. We are now reminded of Crum's observation referred to earlier which indicated the positive association of profitability with size of American firms during the depression period of 1931 to 1936.(1)

Finally, let us recapitulate in brief our findings in this section. First, it is observed that profit rates of large firms as a whole are less than those of smaller firms in all three sub-periods and over the whole 18-year period studied. Second, on a single year basis, little association between profitability and size of firms is observed. Third, we have noted a trace of a weak, not statistically significant, positive association between profitability and size in years of generally sluggish economic activity. It is too weak, however, to modify our initial observation of an inverse relationship.

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(1) See pp.43-4 above.

Table 3.1

Mean Rates of Return and Rank Correlation Coefficients Between Size and Mean Rates of Return

	Size-Group[1] (£'000)	1950-55 No. of Cos.	1950-55 Profit Rates (%)	1956-61 No. of Cos.	1956-61 Profit Rates (%)	1962-67 No. of Cos.	1962-67 Profit Rates (%)	1950-67 No. of Cos.	1950-67 Profit Rates (%)
A)	All Companies								
1	0-49	4	12.6	1	12.0	..	..	3	12.1
2	50-99	10	14.6	4	14.6	2	9.3	9	9.2
3	100-199	26	8.4	19	10.4	7	2.7	15	7.2
4	200-399	51	10.4	33	7.9	32	9.4	31	8.3
5	400-799	46	8.6	56	8.4	42	6.2	32	6.7
6	800-1,599	29	7.6	59	7.6	44	6.6	25	7.8
7	1,600-3,199	12	8.2	25	7.5	52	6.2	10	7.2
8	3,200-6,399	11	12.2	26	6.0	33	7.3	11	10.5
9	6,400-12,799	6	6.9	11	7.5	24	7.0	6	6.5
10	12,800-25,599	2	6.1	6	7.3	15	7.5	2	7.4
11	25,600-51,199	2	5.3	5	10.7	6	6.9	2	5.8
12	51,200-102,399	..	..	1	8.8	3	11.1	..	..
13	102,400 and over	..	..	..	..	1	5.4	..	..
	Total[2]	199	9.3	246	8.0	261	6.9	146	7.9
	Rank correlation coefficients: Profit rates & Size-group:-		-0.87**		-0.42*		0.51		-0.65**

	Size-Group[1] (£'000)	1950-55 No. of Cos.	1950-55 Profit Rates (%)	1956-61 No. of Cos.	1956-61 Profit Rates (%)	1962-67 No. of Cos.	1962-67 Profit Rates (%)	1950-67 No. of Cos.	1950-67 Profit Rates (%)
B)	'330'-Firms								
1	0-49	1	24.1	..	..	..	..	1	16.2
2	50-99	7	16.2	2	25.3	..	..	6	11.7
3	100-199	11	10.1	14	9.9	2	-3.6	10	8.8
4	200-399	40	11.2	25	9.4	27	10.5	28	8.8
5	400-799	36	8.6	49	8.9	39	6.5	29	6.7
6	800-1,599	25	8.0	55	7.6	42	6.6	23	7.8
7	1,600-3,199	11	8.5	23	7.8	50	6.3	10	7.2
8	3,200-6,399	11	12.2	26	6.0	33	7.3	11	10.5
9	6,400-12,799	6	6.9	11	7.5	24	7.0	6	6.5
10	12,800-25,599	2	6.1	6	7.3	15	7.5	2	7.4
11	25,600-51,199	2	5.3	5	10.7	6	6.9	2	5.8
12	51,200-102,399	..	..	1	8.8	3	11.1	..	..
13	102,400 and over	..	..	..	..	1	5.4	..	..
	Total[1]	152	9.9	217	8.3	242	7.1	128	8.2
	Rank correlation coefficients: Profit rates & Size-group:-		-.85**		-.43***		.32**		-.72***

	Size-Group[1] (£'000)	1950-55 No. of Cos.	1950-55 Profit Rates (%)	1956-61 No. of Cos.	1956-61 Profit Rates (%)	1962-67 No. of Cos.	1962-67 Profit Rates (%)	1950-67 No. of Cos.	1950-67 Profit Rates (%)
C)	Income-Firms								
1	0-49	4	12.6	1	12.0	..	..	3	12.1
2	50-99	9	14.5	4	14.6	2	9.3	7	9.7
3	100-199	26	8.8	18	10.6	7	2.7	15	8.5
4	200-399	49	10.8	31	8.6	28	11.6	29	8.6
5	400-799	43	9.3	52	8.9	34	7.6	25	8.0
6	800-1,599	28	7.8	56	8.2	40	7.5	24	7.9
7	1,600-3,199	12	8.2	23	7.9	48	7.3	10	7.2
8	3,200-6,399	11	12.2	23	6.3	30	7.7	11	10.5
9	6,400-12,799	6	6.9	11	7.5	23	7.2	6	6.5
10	12,800-25,599	2	6.1	6	7.3	15	7.5	2	7.4
11	25,600-51,199	2	5.3	5	10.7	6	6.9	2	5.8
12	51,200-102,399	..	..	1	8.8	3	11.1	..	..
13	102,400 and over	..	..	..	..	1	5.4	..	..
	Total[1]	192	9.7	231	8.5	237	7.8	134	8.4
	Rank correlation coefficients: Profit rates & Size-group:-		-.87***		-.47**		-.23		-.75***

Notes: (1) The size of the firms is measured at the initial year of each period.

(2) Number of firms included differ between sub-periods because of the inclusion of 'Discontinued' firms.

* Significant at 10 per cent level
** Significant at 5 per cent level
*** Significant at 1 per cent level
**** Significant at 0.1 per cent level

Table 3.2

Rank Correlation Coefficients : Profit Rates and Size Group - 8 Major Industries

A) All-Firms

Industrial group[1]	1950-55	1956-61	1962-67	1950-67
1	.10	-.47	-.40	-.70
2	-.29	-.05	-.55	-.36
3	-.38	.15	.49	.00
4	-.89***	-.75**	-.76**	-.83**
5	-.95****	-.83**	.04	-.67**
6	-.50	-.24	.26	-.70*
7	-.28	-.82***	.30	-.73**
8	-.20	-.64*	-.49	-.94***
All industries	-.82***	-.42*	.51	-.65**

B) '330' Firms

Industrial group[1]				
1	.10	-.43	-.14	-.70*
2	-.40	-.08	-.38	-.36
3	-.23	-.09	.45**	.00
4	-.89**	-.75***	-.59**	-.57
5	-1.00f	-.83***	-.10	-.70***
6	-1.00f	-.68**	.68**	-.80**
7	-.70	-.82***	.14	-.82***
8	-.90**	-.57**	-.30	-.90**
All industries	-.85***	-.43***	.32**	-.72***

C) Income-Firms

Industrial group[1]				
1	-.60	-.43**	-.10	-.40
2	-.52**	-.17	-.72***	-.54
3	-.33	-.07	.44**	-.09
4	-.83***	-.57**	-.50	-.83***
5	-.88***	-.90***	-.12	-.73***
6	-.60*	-.24	.67**	-.89**
7	-.36	-.82***	.05	-.77***
8	-.77**	-.60**	-.49	-.94***
All industries	-.82***	-.47**	-.23	-.75***

* Significant at 10 per cent level
** Significant at 5 per cent level
*** Significant at 1 per cent level
**** Significant at 0.1 per cent level
f Perfect correlation

(1) For industry classification, see Appendix Table C.1.

Table 3.3

Rank Correlation Coefficients : Annual Profit Rates and Size Group

Years	A) All-Companies Rank Correlation Coefficients: Profit Rates and Size Group	B) '330' - Firms Rank Correlation Coefficients: Profit Rates and Size Group
1950	-.77***	-.93***
51	-.61**	-.73**
52	-.49	-.84***
53	.06	-.34
54	-.08	-.46*
55	-.19	-.28
56	-.13	-.24
57	.15	.15
58	.26	.36
59	.37	.44*
1960	-.04	-.21
61	-.43	-.38
62	.03	-.06
63	.07	-.42*
64	-.09	.20
65	.25	.18
66	.40	.33
67	.05	.04

* Significant at 10 per cent level
** Significant at 5 per cent level
*** Significant at 1 per cent level

SECTION III: Deficit-firms

Before discussing the possible explanations of the inverse association between profitability and size of firms in Australia we will first examine another feature of 'profitability' which may be of importance to entrepreneurs in addition to that expressed by annual average profit.

In the 18 years ended in 1967 there appeared to be a general declining trend in the average earning rates on net assets in our 402 firms. This trend is indicated in Table 3.4 below together with that of all Australian manufacturing companies which are listed in the Sydney Stock Exchange. Over our three sub-periods the profit rates of our companies declined from 8.7 per cent in 1950-55 to 7.3 per cent and then 6.8 per cent in the succeeding two periods.(1)

The decline in the average profitability is associated with a greater dispersion in profit rates between each of the 402 firms. In other words, as profitability declined the extent of differences in annual profit rates between firms became more pronounced. Further, the number of non-income firms rose from a minimum figure of four in 1951 to a peak of 28 in 1963. Altogether 123 firms have either made no profit or suffered a loss at least once in their operating years during the period studied. In fact the majority of these firms made a loss in more than one year. The following questions then arise: why did these firms fail to make profits; were they operating in particularly competitive markets; were their business structures quite different from those of profitable

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(1) For detailed discussion of overall trends in Australian manufacturing see for example, A. Hall, Australian Company Finance. Sources and Uses of Funds of Public Companies. 1948-1953, the Australian National University - Social Science Monographs 7, (Canberra: Australian National Univ. Press, 1956); and the series of survey articles on the Australian Economy published in Economic Record since 1956 and reprinted in H.W. Arndt and W.M. Corden (eds.), The Australian Economy, (Melbourne: F.W. Cheshire, 1963), Part One.

Table 3.4

Annual Average Profit Rates per Net Assets after Tax

Years	Our sample firms No. of cos.	Profit Rates (%)		Total Listed Companies in Manufacturing Industries(1) No. of cos.	Profit Rates (%)
1950	175	9.5		n.a.	
51	206	9.9			
52	235	7.7	six-year		
53	232	4.4	average		
54	228	10.6	8.7		
55	253	9.8			
56	286	8.2		555	8.2
57	290	7.6		551	8.2
58	292	6.1	7.3	540	8.1
59	280	8.0		521	8.6
1960	282	7.8		494	6.2
61	290	6.1		514	5.9
62	298	6.9		595	6.1
63	302	6.6		596	6.8
64	300	7.3	6.8	598	7.2
65	299	7.5		584	6.6
66	293	6.6		565	6.8
67	280	5.7		538	n.a.

Note: (1) This includes almost all companies for which data were given in the annual 'Investment Service' of the Research and Statistical Bureau of the Sydney Stock Exchange, and certain firms which have been taken over by these companies.

n.a.: not available.

Source: For total public companies in manufacturing industries - Reserve Bank of Australia, Statistical Bulletin, Company Supplement, February and November 1963, August 1968.

firms?(1)

In Table 3.5 the distribution of deficit firms in various types of market is shown. At first glance, it may appear that the proportion of deficit-firms becomes greater as the degree of business concentration declines. But the extremely large proportion of deficit-firms operating in high oligopolistic markets undermines any generalization about the relationship between income-firms and high concentration. Twenty one firms are observed to have failed to make profits in high-oligopolistic markets. Of these, nine are in cotton textiles, three in tobacco and cigars and two each in motor vehicles, confectioneries, and ice-cream, etc.

Traditional theory suggests that monopolists and oligopolists will have very high rates of return insofar as they can preserve their position under favourable demand and cost conditions they earn only as much as competitive industries.(2) The cotton textile industry, in which nine deficit firms are recorded, is one of the examples in which demand conditions were unfavourable. On the other hand tobacco and cigars, motor vehicle manufacturing, confectioneries, and ice-cream etc. represent industries in which considerable changes in the market structures were observed (see Table 2.4 on p.28). In these four industries, the largest firm or firms expanded their market shares rapidly and at the same time made profits continuously while the nine observed deficit firms failed to do so.

Although market control may be a factor it seems more likely that large size is of more importance in enabling monopolists and oligopolists

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(1) It is often suggested that a relatively poor profits record is likely in the few years immediately following the establishment of a firm. Only eight firms out of the total 123 deficit firms were in their first five years of operation. However, since our sample firms include only listed public companies and they represent relatively large-size firms, we are not able to draw any general conclusions concerning the relationship between poor profit performances and the 'infant stage' of firms' operations. See, for example, W.L. Crum, The Age Structure of the Corporate System, (Univ. of California, 1953), Chapter V.

(2) G.J. Stigler, Capital and Rates of Return in Manufacturing Industries, National Bureau of Economic Research (Princeton Univ. Press, 1963).

Table 3.5

Distribution of Deficit-firms by Various Concentration Groups; 1950-1967

Market Structure	(1) No. of Deficit-firms	(2) Total No. of Firms	(1) as a proportion of (2) (%)
1 Monopolistic and duopolistic industry	2	16	12.5
2 High-oligopolistic industry	21	66	31.8
3 Moderate-oligopolistic industry	17	77	22.1
4 Low-oligopolistic industry	21	81	25.9
5 Unconcentrated industry	33	91	36.2
6 Competitive industry	7	23	30.4
7 High-competitive industry	22	48	45.8
Total	123	402	30.6

Table 3.6

Distribution of Deficit-firms by Net Assets; 1950 1958 and 1967

Size Group(1)	1950 No. of Deficit-Firms	1950 Total No. of Firms	1958 No. of Deficit-Firms	1958 Total No. of Firms	1967 No. of Deficit-Firms	1967 Total No. of Firms
1	..	4	2	2	..	..
2	2	7	1	4	1	3
3	10	20	10	23	7	9
4	10	43	14	45	6	18
5	5	45	16	53	11	50
6	3	27	13	61	11	42
7	..	11	14	44	8	50
8	1	11	5	30	4	43
9	..	6	1	15	2	26
10	..	1	1	7	..	21
11	..	2	..	5	..	9
12	..	..	..	2	..	5
13	..	..	..	..	..	3
Total	31	177	77	291	50	279

Note: Some firms are included in more than one of the selected three years thus the aggregated figure exceeds the grand total of 123 deficit-firms.

(1) For size classification of the firms, see Appendix Table D.5

to minimize or completely avoid losses over time. Table 3.6 shows the distribution of deficit firms in different size groups. Deficit firms are all small or medium sized firms and no large firms with their 1967 value of net assets exceeding, for example, £25.6 million failed even once to make a profit during their operating period.(1) This may be partly due to the accounting conventions which large firms commonly adopt: for public relations purposes they seek to minimize fluctuations of reported annual earnings rates by distributing high profits over years of low profit. But more so is this attributable to the deliberate policy of large firms which organize themselves in the areas of production, marketing and finance so as to minimize dangers of making losses and of failing to attain continuous growth in time of recession. As one of the devices for pursuing this goal large firms often diversify their production lines and invest in other companies so as to be able to offset losses for one source of profit by income from others.(2)

The observed concentration of deficit firms in smaller size groups leads us to consider the extent of fluctuation of annual profit rate over time in relation to size of firms. Variability of profit rate of individual firms is measured by the value of the standard deviation of its average annual profit rates over time and is shown in Table 3.7. Fluctuations of annual profit rates appear, on the whole, to decrease with size of firms. This declining trend is not systematic but a marked difference can be seen between size groups 1 to 6 and 7 to 11 inclusive. Increase in stability of annual profit rates is pronounced in the largest five size groups.(3)

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(1) A similar observation is made by Galbraith in the United States. He states that 'In 1957, a year of mild recession in the United States, not one of the one hundred largest industrial corporations failed to return a profit. Only one of the largest two hundred finished the year in the red.' Furthermore one of the largest firms in America, the United States Steel Corporation, '. . . has not had losses for a quarter of a century'. Galbraith, The New Industrial State, op.cit., p.82.

(2) The aspect of diversification in large firms is further examined in Chapter V.

(3) Similar observations were made by Stekler, Samuels and Smyth, Singh and Whittington, and others. See, Stekler, op.cit., Chapter VI, Samuels and Smyth, op.cit., Section III, and Singh and Whittington, Chapter 6.

Firms whose net assets exceeded £1,600,000 in 1950 are mostly monopolists or high and moderate-oligopolists (see Table 2.5 in Chapter II), and their market control may certainly contribute to the relatively stable nature of their profitability.(1)

Table 3.7

Standard Deviation of Annual Profit Rates per Net Assets of Firms in each Size Group, 1950-67

Net Asset Size Groups (1950 basis)		Standard Deviation of Profit Rates
Size Groups	~~Upper limit~~ (£'000)	%
1	0-49	9.6
2	50-99	18.2
3	100-199	12.9
4	200-399	8.8
5	400-799	14.2
6	800-1,599	8.6
7	1,600-3,199	7.0
8	3,200-6,399	6.6
9	6,400-12,799	4.7
10	12,800-25,599	2.2
11	25,600-51,199	2.9
12	51,200-102,399	..
13	102,400 and over	..

Note: There are no firms whose size exceeded £51,200,000 in 1950.

In the previous section we observed that annual profitability averaged over a number of years does not increase with size, and large size itself does not usually appear to provide any advantages so far as

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(1) Variability of profit rates of firms was also calculated in various types of market for the period 1950-67 and is shown below:

	Concentration groups	Standard Deviation of annual profit rates (%)	
1	Monopolistic and duopolistic industries	5.9	Average 9.0
2	High-oligopolistic industries	9.9	
3	Moderate-oligopolistic industries	8.1	
4	Low-oligopolistic industries	12.4	Average 12.1
5	Unconcentrated industries	12.0	
6	Competitive industries	11.5	
7	High-competitive industries	12.5	

ability to obtain high profitability is concerned. But the investigation in this section suggests that the certainty of profit increases with size and large firms in general rarely fail to make profits which are also usually stable, though not necessarily high, over time. On the other hand smaller firms seem to take higher risks in exchange for the chance of high profit in case of success. If we assume that certainty is preferred to higher but riskier profit, a stable average profitability of large firms would make large size attractive and provide some inducement for firms to grow. Having noted this point we may now turn to a consideration of the observed inverse association between average profitability and size.

In order to explain empirical observations which indicate higher average profitability for smaller firms than large ones, several reasons have been offered:

1. J. Steindl argues that the observed declining relationship between size and profitability of firms could be the result of an increase in capital intensity with increasing size.(1) Large firms usually employ capital intensive techniques and consequently the capital sales ratio $(\frac{K}{S})$ is high. This hypothesis is often quoted in order to explain the lower earning rates per capital invested observed in larger firms, but we are still left in doubt as to why profit rates should increase less than assets with increasing capital intensity.(2)

2. R.C. Osborn suggests that many large corporations are old and have developed the traditional conservatism of age and large size. Thus their expansion process may be slowed down and hence rates of return tend to be lower.(3) This argument assumes that the more rapidly expanding small and medium-sized firms are more profitable in part because they are

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(1) Steindl tested his hypothesis with evidence based on 1939 data and found that asset-sales ratios increased with size up to the third largest of his ten size classes (assets less than $US5,000,000) and thereafter remained fairly constant. Steindl, op.cit., Chapter III.

(2) See J.S. Duesenberry, Business Cycles and Economic Growth, (New York; McGraw-Hill, 1958), pp.58-9.

(3) Osborn, op.cit., p.77.

expanding, and that when they come to the end of the expansion period their profitability will also be at a lower level.

3. There is a traditional view of risk premiums which proposes that investors demand and obtain a higher rate of return from those firms that have greater fluctuation of earning rates. Investors normally assume that risks of making a loss decrease with size; therefore smaller firms are expected to obtain higher profit in successful years.(1)

4. It has also been suggested that large firms are in reality a composite of several small firms each of which may be regarded as an independent profit centre.(2) If this is the case, there is little reason to expect that large firms would make markedly higher profit than smaller ones.

What other possible explanations can we provide for the observed inverse associations between profitability and size of firms in Australia? As we have seen earlier, the smaller and medium-sized firms are less likely to have diversified income sources and hence a failure in the one area, or in one of the few areas, in which they are operating is likely to result in an overall loss. If such errors are made repeatedly these firms are likely to go bankrupt or be forced to accept take-over bids and consequently excluded from our study. Large firms, on the other hand, are likely to be diversified, to operate in different product and geographical markets, and they might experience a loss in one or several fields without making an overall loss. This helps explain the particular behavior of the 'income-firm' group noted above on pp.51-2 which indicated a stronger inverse relationship between profitability and size as compared with that of the 'all-firm' group. If less diversified smaller firms are likely to experience an over-all loss through one or a few failures, those mismanaged firms will be consequently excluded from the list of profitable firms,

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(1) See, for example, Steindl, op.cit., Chapter IV.

(2) See for example, S. Alexander, 'The Effect of Size of Manufacturing Corporation on the Distribution of the Rate of Return', Review of Economics and Statistics, Vol.31 (August 1949), pp.229-35.

i.e., the 'income-firm' group. The result is that the profitability of the remaining successful small firms would be fairly high because few, or even no, unsuccessful projects are included to dilute their income from profitable ventures. Thus it may be expected that smaller successful firms report higher profit than large firms among the 'income-firm' group as is indicated in Tables 3.1 and 3.2 by a higher inverse correlation in this group compared with that in the 'all-firm' group.

In addition, when studying a period in which a rapid expansion took place in various areas of manufacturing industry, we must not neglect the important effects of such factors as market growth, changes in market structures and overseas competition which differs between markets according to the federal Government's tariff and import restriction policies. In a growing market excess demand provides higher profits and capital - sales ratios will decline. Thus, in spite of the 'capital requirement barriers' suggested by Baumol, large firms and capital intensive industries may not necessarily obtain higher profit rates if the less capital intensive markets are growing more rapidly than the capital intensive markets. Large firms in our sample are mostly monopolists or high-oligopolists(1) and, theoretically, might be expected to obtain higher profit rates through their market control. Market structure in the post-war period, however, proved to be ~~very~~ unstable. As we have seen in Chapter II mergers changed market structure in many industries and in particular, large oligopolists competed to expand their market share and consequently concentration was further increased in already highly concentrated industries. It has been shown in the U.S.A. that average profit rates in concentrated industries were considerably higher than those in less concentrated industries and hence large monopolists and oligopolists were making higher profit than smaller competitive firms.(2) Such relations

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(1) See pp.36-9 above.

(2) Using 1950-60 U.S. data, Mann found that there was a distinct difference between the average rates of return in less concentrated industries and in industries where the top eight firms accounted for more than 70 per cent of output. The average profit rate for the concentrated group was reported to be 13.3 per cent as compared with 9.0 per cent in the former group. Similar results were previously found by Bain for the period 1936-40 and 1947-51. Mann, op.cit.

are found to be less obvious in Australia in the period studied. In Table 3.8 below we have estimated differences in post-tax profit rate on net assets for firms operating in various types of markets for the periods 1950-58 and 1959-67. We find that profit rates are higher for firms in concentrated markets compared with those in the less concentrated markets but the difference appears to be marginal.

Table 3.8

Average Post-tax Profit Rates per Net Assets per Annum in Various Concentration Groups: 1950-58 and 1959-67

Concentration Groups	Average Profit Rates per Annum 1950-58 %		1959-67 %	
Monopolistic and duopolistic industries	10.1		7.8	
High-oligopolistic industries	10.5	Average 9.7	8.9	Average 7.7
Moderate-oligopolistic industries	8.6		7.2	
Low-oligopolistic industries	9.7		6.7	
Unconcentrated industries	8.2		5.7	
Competitive industries	8.9	Average 8.8	7.0	Average 6.3
High-competitive industries	9.3		6.2	

Notes: Rank correlation coefficients between average profit rates and degree of concentration were also calculated for each of the 18 years studied. Eleven negative and seven positive relations are reported, only six (five positive) of them are significant at the 10 per cent level. This indicates that there is little association between profit rates and degrees of concentration.

As we have seen, economic theory assumes that certain factors which are associated with size such as technical, marketing and financial opportunities will work in the direction of higher rates of return for larger corporations. This anticipation is, however, realized only under the assumption that all firms are pursuing a profit maximization goal. If the assumption does not hold equally for firms of different sizes, and larger firms are pursuing other maximizing objectives such as fast growth, then there is little reason to expect that larger firms would record higher profit rates. In particular, from the point of view of firms' investment decisions, growth and profit goals can not be regarded as identical criteria for the selection of investment programmes,(1) but rather fast

(1) See Chapter VI, Section II.

growth often depresses firms' earning power as we will see later.(1) Therefore contrary to the prediction of economic theory we might expect larger firms to report lower profit rates than smaller firms. This explains our previous observation (p.52 above)that the theoretical proposition, which suggests higher profit rates for larger firms, is supported to some extent only in sluggish years when firms growth rates are restrained. This is the argument we will put forward in the succeeding chapters, but here we note simply that our observed inverse relationship between size and profit rates does not support the generally suggested theoretical proposition.

SECTION IV: Profitability Persistency

In the previous three sections, our attention was focussed on the differences in profitability of firms in various size classes. Firms were grouped according to their size and the study was conducted on inter-class differences in average profit rates. No mention was made of inter-company differences in profitability. The discussion in this section will be therefore directed towards the level of profit of each company over time.

In an economy which is fundamentally characterized by continuous growth and change, individual firms organize their activities in the way which they regard as best suited to these processes of growth and change. They aim to build up market control, or to diversify products, or to grow fast or to increase their shareholdings in firms in various markets, etc. It cannot be assumed that there is a fixed path by which equilibrium is reached, for entrepreneurs encounter continuous changes in the environment in which they operate such as shifts in demand and costs, introduction of new techniques and changes in the structures of the market. The types of internal organization which are employed by each firm are varied, and in practice it is difficult to estimate their effect on the resulting changes in business performance.

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(1) See Chapter V.

Without giving any rigid description of the maximizing object of each firm, we may however roughly indicate whether a firm is successful or not by ascertaining if it continuously makes high profits (above average in its industry?) throughout a given period. This line of thought has led several economists to enquire whether there is such a thing as 'good' or 'bad' management.(1) The criteria employed differs between scholars, but they generally emphasize the importance of the internal conditions of firms as being an explanatory factor of profitability differences.

To begin with let us examine the relationship of the average profit rates of our firms in and between the three sub-periods 1950-55, 1956-61, and 1962-67. Our aim will be to see if there is any tendency for the rate of profit of individual firms to persist over the sub-periods studied and further to find if firms which made a relatively high (or low) rate of profit in a given six-year period also tend to make high (or low) profit rates in the following six years.

The relationships between the average post-tax profit rates on net assets in the two successive periods are plotted in Diagrams 3.1 and 3.2 for the period 1950-55 and 1956-61, and 1956-61 and 1962-67. The results of the simple linear regression analysis are given in Table 3.9 for firms in different industrial groups, and different market structures. The results show that there is a positive relationship (the b coefficient is positive in each case in Table 3.9) between the rates of return in the two successive six-year periods in all the '8 major industrial groups' as well as in the 'all industries' group. In other words, firms with relatively high profitability in one six-year period are likely to maintain their good performances in the subsequent six-year period. This

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(1) See for example, T. Barna, Investment and Growth Policies in British Industrial Firms, Occasional Papers XX, National Institute of Economic and Social Research, (Cambridge Univ. Press, 1962), I.M.D. Little and A.C. Rayner, Higgledy Piggledy Growth Again, (Oxford; Basil Blackwell, 1966), and its review by W.B. Reddaway, Economic Journal, Vol. 77 (Sept. 1967) pp.595-8, and A. Singh and G. Whittington, op.cit., Chapter 6.

relationship is particularly pronounced in the Iron and steel, and Electrical engineering industries for both successive periods, and in industries such as Chemicals, Saw mills etc., and Newspapers for one of the two subsequent periods. In statistical terms it may be said that the average rates of return on net assets in the Iron and steel industry, for example, in the period 1950-55 explains more than 46% ($r^2 = 0.462$, see Table 3.9) of the variance of average rates of return in the succeeding period of 1956-61.

In the rest of the cases the relationship appears to be relatively weak, though positive, and there seems to be little relationship between rates of return on net assets in the two periods. However, a study of Diagrams 3.1 and 3.2 suggests that such weak relationships may be partly due to the inclusion of extreme observations which made a loss in one of the periods (observations plotted in the second and fourth quadrants of the diagrams). Thus a relatively large number of deficit-firms in the Cement etc., Textiles, Clothing and footwear, Food, tobacco and beverages industries may partly explain their weak regression results.

Diagrams 3.1 and 3.2 require a further comment. If we assume 'good' or 'bad' management continues for a certain period, we should expect to find some persistency in both the high profitability, and low profitability or even loss-making of firms over successvie time-periods. In the case of continuation of 'bad' management, we must note that few firms can stay in business when they make a loss persistently over a number of years. Concerning our sample firms, most of the badly managed deficit-firms were either liquidated or taken over by other firms before they recorded a persistent loss throughout two successive sub-periods (i.e., for 12 years). This is shown in the diagrams in which there are only a few observations plotted in the third quadrants indicating firms making a persistent loss over the two successive periods.

In their survey of 357 British quoted companies, Singh and Whittington found a similar but slightly stronger persistence of average profit rate on net assets between the two successive periods 1948-54 and

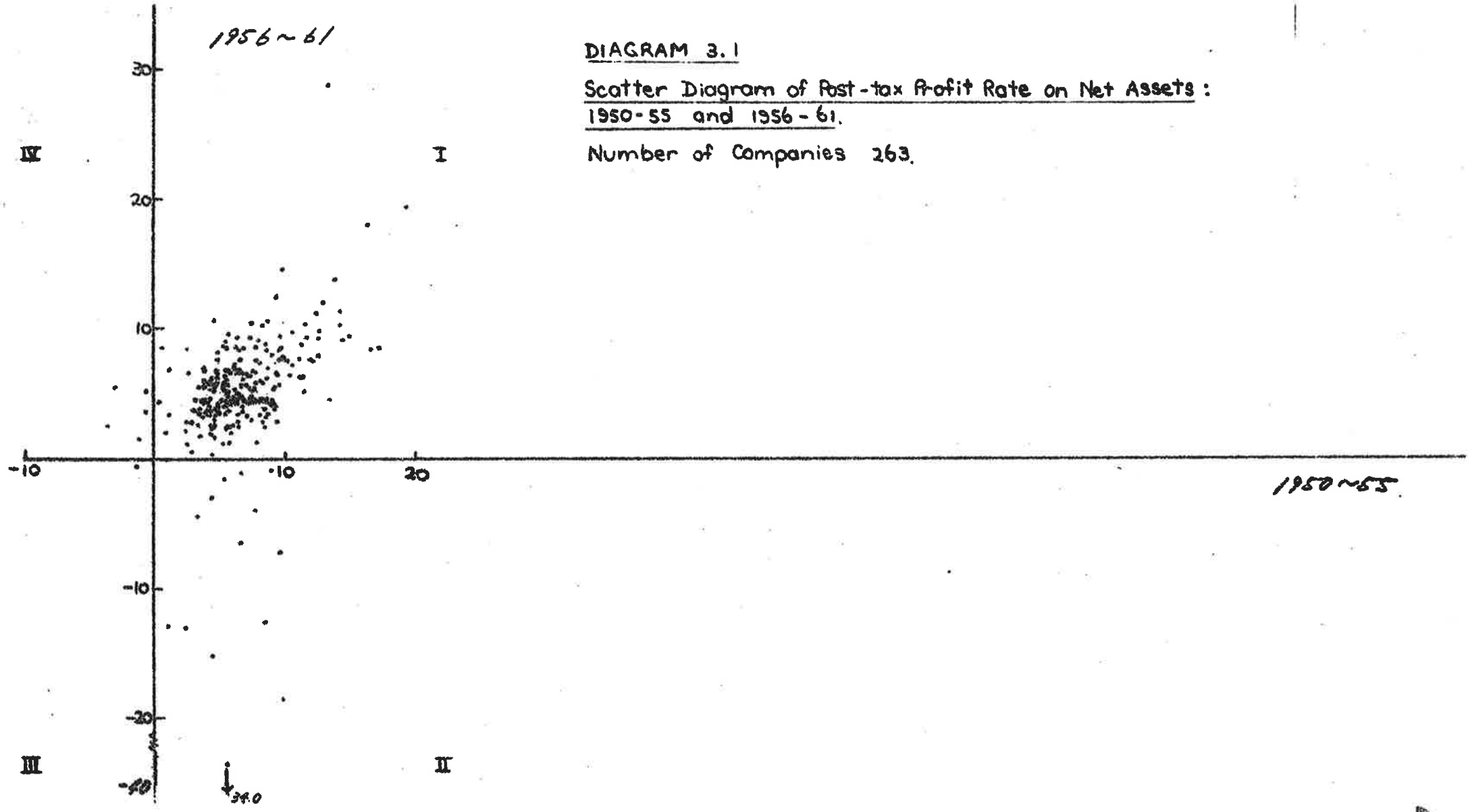

DIAGRAM 3.1

Scatter Diagram of Post-tax Profit Rate on Net Assets : 1950-55 and 1956-61.

Number of Companies 263.

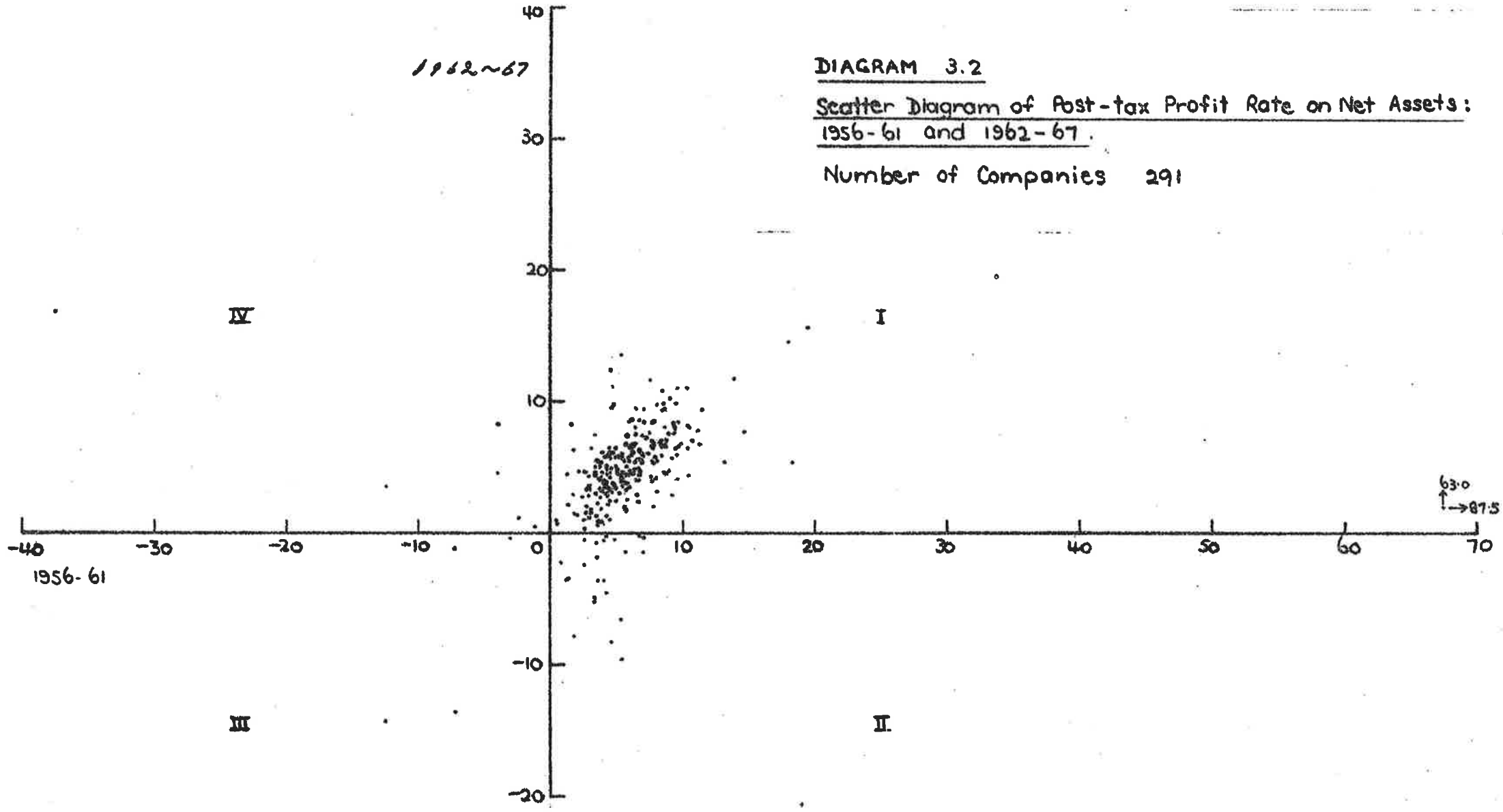

DIAGRAM 3.2

Scatter Diagram of Post-tax Profit Rate on Net Assets: 1956-61 and 1962-67.

Number of Companies 291

Table 3.9

Results of Regressions of Rate of Return on Net Assets

i) in 1956-61 on that of 1950-55
ii) in 1962-67 on that of 1956-61

Regression coefficient r^2
Regression equation,

$$P_{t+1} = a + bP_t + \epsilon$$

Where a and b are constant terms

ϵ, the standard error term
P, profitability on net assets (%)
t, 1950-55 in Column (i)
1956-61 in Column (ii)
t+1, 1956-61 in Column (i)
1962-67 in Column (ii)

Industries	(i) Regressions of Rate of Return in 1956-61 on that of 1950-55				(ii) Regressions of Rate of Return in 1962-67 on that of 1956-61			
	r^2	a	b		r^2	a	b	
8 major industrial groups								
1 Cement, etc.	.00002	10.07	.003	.80	.05	8.86	.16	.52
2 Chemicals	.10	6.72	.31	1.11	.43	6.48	.37*	.63
3 Iron and steel, etc.	.46	7.58	.59*	1.39	.25	7.06	.39*	.75
4 Electrical engineering	.42	8.83	1.01*	.92	.26	6.05	.60*	.78
5 Textiles, clothing and footwear	.02	7.39	.19	1.09	.07	3.93	.23+	.89
6 Sawmills, etc.	.33	8.10	.19+	.65	.03	4.84	.41+	1.10
7 Food, tobacco and breweries	.15	8.42	.38*	.70	.04	8.02	.17	.59
8 Newspapers	.02	9.12	.07	1.07	.65	9.16	.52*	.85
Concentration groups								
1 Monopolistic and oligopolistic industries	.37	7.65	.24*	.74	.09	8.77	.30	.81
2 High-oligopolistic industries	.30	9.36	.44*	1.10	.17	7.22	.48*	1.04
3 Moderate-oligopolistic industries	.02	8.30	.09	.56	.45	8.08	.53*	.50
4 Low-oligopolistic industries	.15	7.37	.61*	.80	.27	5.80	.42*	.50
5 Unconcentrated industries	.07	5.94	.22+	.66	.06	4.79	.31+	.79
6 Competitive industries	.08	9.31	.24	1.54	.05	4.79	-.14	.84
7 High-competitive industries	.02	10.16	.26	2.57	.05	5.16	.15	1.13
All industries	.10	7.97	.32*	.43	.11	6.26	.31*	.34

* Significantly different from zero at the 5 per cent level.
\+ Significantly different from zero at the 10 per cent level.

1954-60.[1] In examining the implication of the observed persistence, they suggest the following explanations as alternatives to the continuity of 'good' or 'bad' management.[2]

1) There may be no real persistence of profitability at all and the observed trend merely arises from persistent growth of assets.

2) The profitability of firms can be also ascribed to the monopoly power which they wield. In this case the observed persistence of profitability may merely indicate the continuity of the monopoly power of profitable firms.

3) Persistent profitability may arise from the different accounting conventions used by various firms. For example, if a firm continuously undervalues its assets, its profit rate expressed on assets would be continuously overstated throughout the period studied.

How important are those objections in our present study? Concerning the first factor, we also conducted in Chapter IV an enquiry to see if there is also a persistence in the growth of firms as measured by annual rate of increase in value of net assets during the period studied. Generally we found only a small association between the rate of growth of firms in the two successive periods, and firms which made continuously high or low profit rates over successive time periods do not coincide with these firms which had a similar experience in growth rates. Therefore we may expect only a minor degree of false persistence of profitability to arise from this factor.

These last two factors present more complicated problems. Our observations show that there is a persistence of profitability in each of the eight major industrial groups, but the degree varies widely between industries and periods concerned. Although these major industries are aggregations of firms manufacturing products of a roughly similar nature, they

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(1) Singh and Whittington, op.cit., Chapter 6.

(2) Ibid., pp.140-4.

include firms operating within different market structures, of different sizes and employing different accounting conventions. In order to confirm whether the observed persistence of profitability reflects a real association of profitability in two successive periods, we made further detailed examinations of successful firms within each identifiable sub-industry group.

We have calculated annual profit rates on net assets for each of the operating years between 1950 and 1967 for all of our 402 firms and they are classified into our '51' industries. The first question to ask is whether there is any discernible pattern in the level of profit rates of each firm on a single-year basis. Are there any firms which persistently reported noticeably higher profit rates over a number of years? General-Motors Holden is one firm which fulfills our offhand expectations in this direction and we also found quite a number of other examples in various industries. The patterns of the profit rates of these constantly successful firms were further studied in relation to the market structures in which they operate. Several interesting discoveries are made which may be summarized as follows:

In several industries we observed a definite leader which continuously made the highest profit over the whole or the majority of the 18 year-period studied but such a marked leadership in terms of profitability is only found in 'high-oligopolistic' industries. These leader firms are; S.A. Rubber Holdings in rubber products manufacturing, G.M.H. in motor vehicles manufacturing, Cellulose Australia in paper making, and Big Sister Foods in biscuits etc. manufacturing industry.

In many of the less concentrated industries, we have also found a successful firm or firms which continuously reported extremely high profit rates compared with other members of their industries. However, the duration of the high-profit period of successful firms appears to shorten as concentration ratios decline. Where the concentration ratio is as low as in group 5 ('unconcentrated' industries), the leading firm or firms usually rarely did well for longer than five years and in some

industries a few firms took turns to show the highest profit rates over the period. This association of declining trend of the success period of highly profitable firms with decreasing concentration ratios is also presented in Table 3.9 on the basis of firms grouped into each concentration class. The table indicates smaller regression coefficients between profit rates in two successive sub-periods in less concentrated industries. In Figures 3.1-3.6 below we demonstrate roughly the general differences in the pattern of behavior of leading profitable firms in various types of industries.

Another important feature is that leading profitable firms vary in relative size. Some are the largest in their industry while others are medium sized or small. This indicates that the persistent high profitability observed in successful firms was not entirely derived from their monopoly power. We have also investigated whether this high profitability is brought about through undervaluation of assets employing the method outlined on p.50 and found that the observed high profitability seems to have been ascribed solely to such accounting conventions only in a limited number of cases.

We may now recognize the great importance of internal factors in explaining the wide differences observed between firms in their capacity or ability to sustain high profit rates. As we have noted earlier these internal factors might be grouped under the general heading of 'managerial qualities' or alternatively 'good' and 'bad' management. Different managements have different driving forces and abilities for profit making and perhaps for growth as well as varying flexibility in the face of changing external conditions. Such internal factors may be more important under certain circumstances than firm size or demand and cost conditions of the market.

The observed differences in the length of persistence of high profit rates shown by successful firms in concentrated and less concentrated industries should attract our attention. Differences between 'good' and 'bad' management are revealed by sustained high profit or a persistent loss

Average Profit Rates per annum in Several Selected Industries, 1950-67.

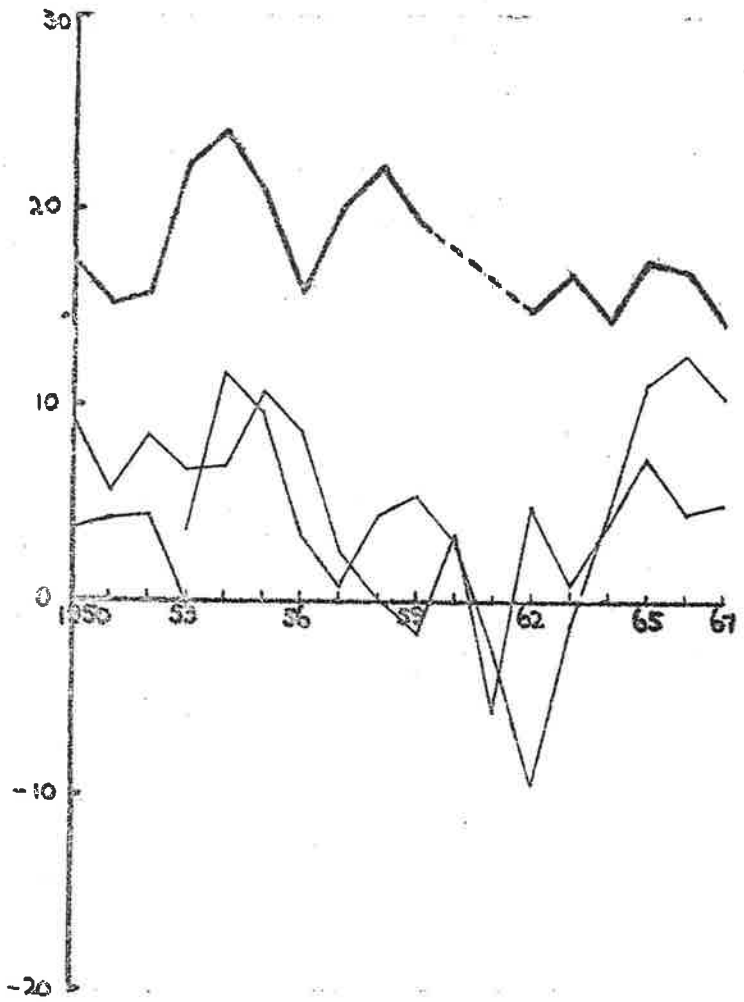

Fig. 3.1 High-oligopolistic industry
Motor Vehicle manufacturing

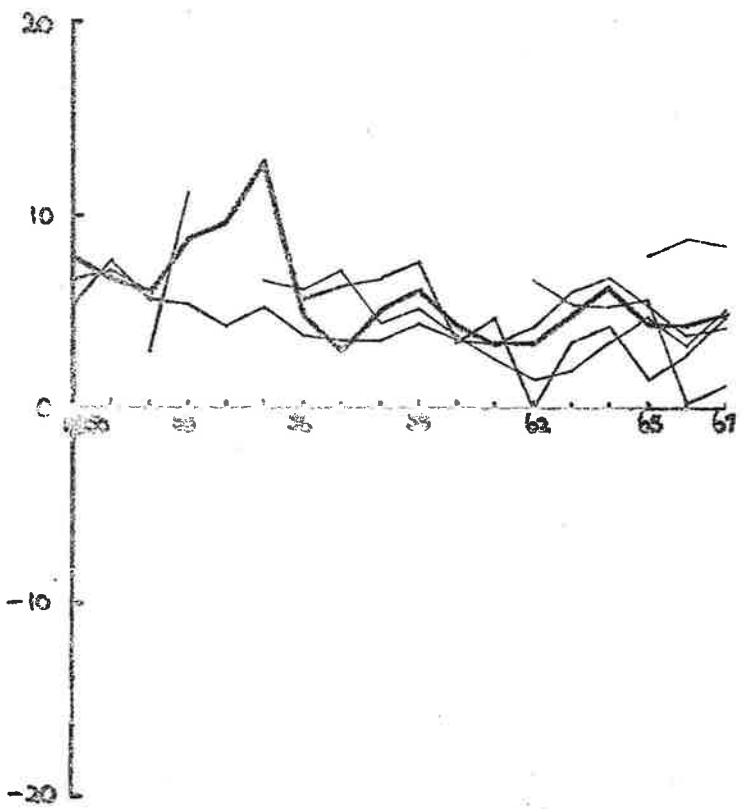

Fig. 3.2 Moderate-oligopolistic industry
Leather manufacturing

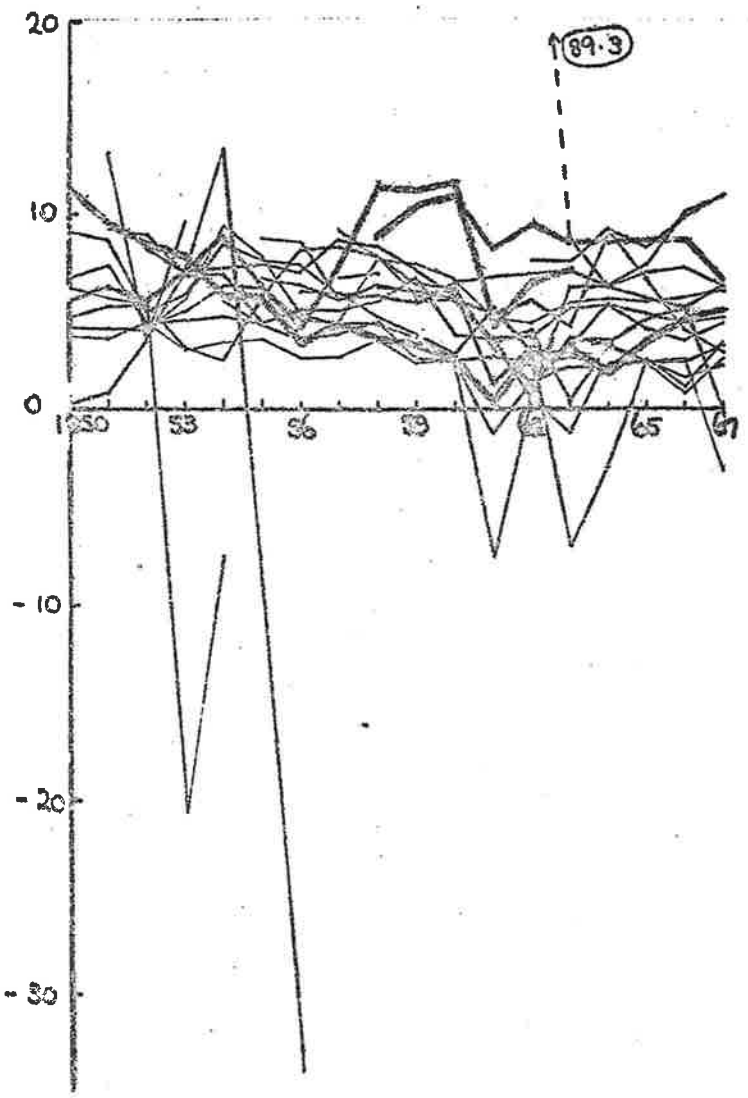

Fig. 3.3 Low-oligopolistic industry
Electrical engineering

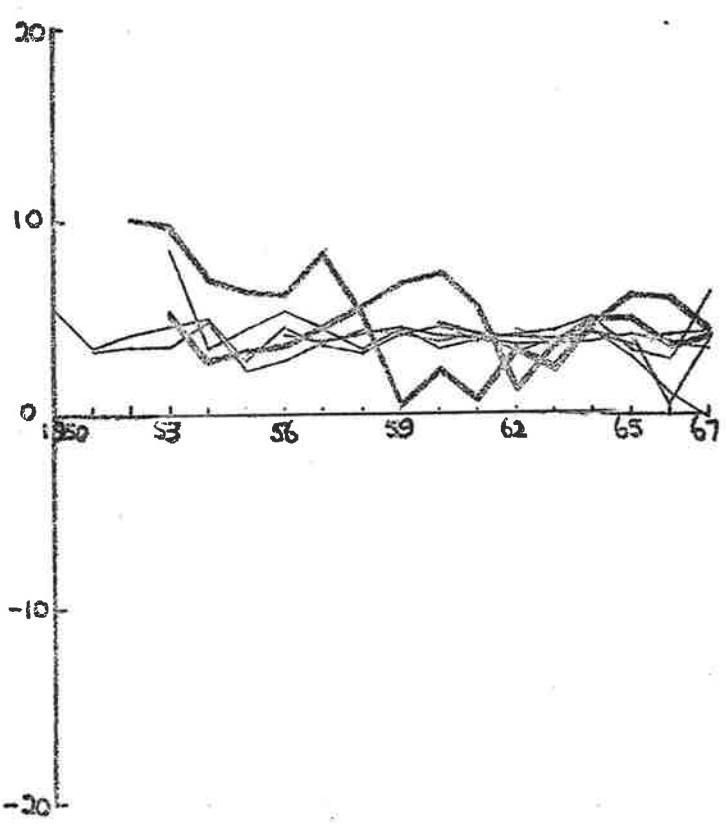

Fig. 3.4 Unconcentrated industry
Flour milling

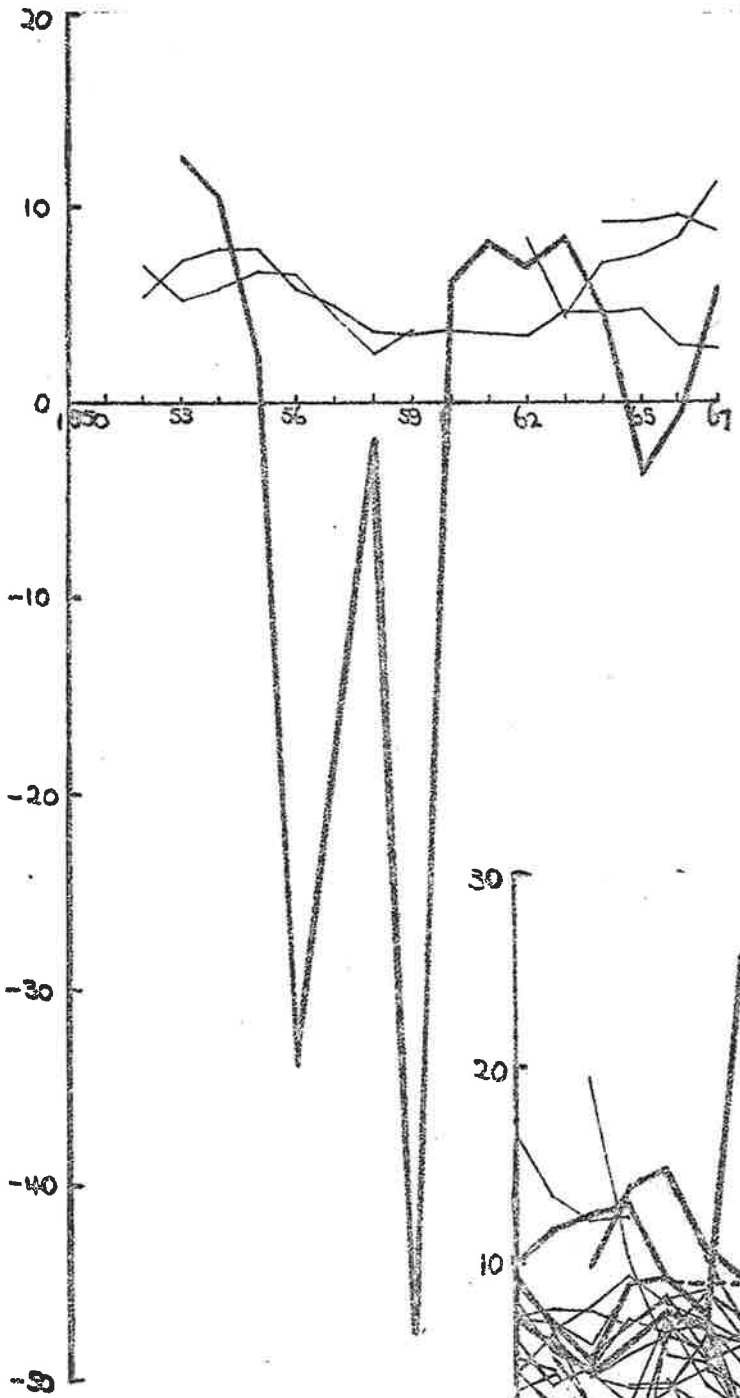

Fig. 3.5
Competitive industry
Footwear (leather)
manufacturing

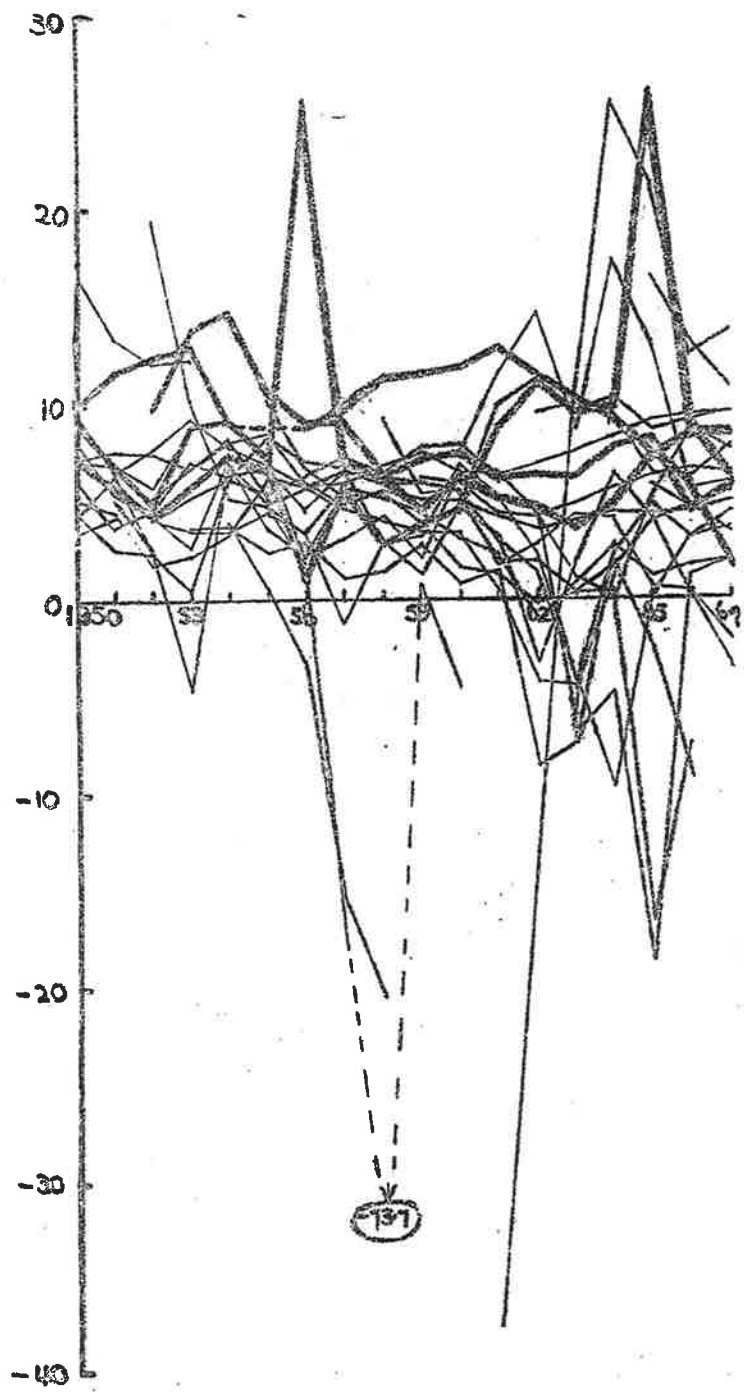

Fig. 3.6
High-competitive
industry
Clothing

in both concentrated and unconcentrated industries. But changes in investment in response to market changes and other disequilibrating elements occur more rapidly and to a greater extent in unconcentrated industries than in monopolistic and oligopolistic industries. In unconcentrated industries good managements make higher profits than their competitors but their advantage may persist only for a short while until less successful firms recognize their faults and reorganize so as to better deal with the situation. This creates a constantly changing hierarchy of groups of successful firms. In monopolistic and oligopolistic industries, on the other hand, successful firms usually are able to maintain their profitable positions for a considerable period of time since they may be protected from new competitors by high entry barriers while the inter-company competition may be mild because of various mutual agreements within their industries.

The essence of our argument here is to suggest that in addition to economic factors such as demand and cost conditions, market structures, etc., internal factors broadly termed 'managerial qualities' also play a very important role in business success. This idea was originally put forward by Marchall who presented the view that the growth of the firm is greatly influenced by the personal characteristics and attitudes of management.(1) Since the days of Marshall, the theory of the firm has been developed in several new directions as joint-stock companies emerged and grew into modern industrial giants. Recently several new hypotheses have been suggested to make the theory of the firm more realistic and relevant to the observed world. As we have noted earlier, economists such as Downie, Penrose, and Marris, for example, look at profit not as the final maximizing goal of firms, but a means to reach other maximizing objectives such as growth.(2) If we accept this view the implication of our findings in this chapter should be examined in the light of the growth behavior of firms. This question, however, will be left until Chapter V.

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(1) A. Marshall, Principles of Economics, (London; Macmillan, 1961) Eighth ed., Book IV, Chapters XI and XII.

(2) Downie, op.cit., Penrose, op.cit., and Marris, op.cit.

APPENDIX TO CHAPTER III

A. Size

The size of firms is measured by book values of net assets (share capital, reserves and long-term liabilities) shown in balance sheet reports. All measures based on the book value of assets are, however, subject to difficulties arising from the differing valuation practices of firms. Usually most firms value their assets on an original cost basis and from time to time they may revalue their assets as price levels change. But all firms do not either revalue simultaneously or on the same basis and this poses difficulties in making any accurate size comparisons of firms.

In order to overcome this problem of conservative estimation of value of assets, Barna, for example, used fire-insurance values in his 1955 estimate of the replacement cost of fixed assets in British manufacturing industry. His general logic was that most firms insure assets against fire and strong incentives can be expected to ensure that valuations for insurance purposes are realistic. In case of over-valuation, premiums are unnecessarily high and recompense for loss will be on the market value and not insured value, while in case of under-valuation premiums may be low but insurance companies will only pay up to the insured value and the firm may lose.(1) Such information is not, however, available for our Australian companies.

There are several alternative measures of the absolute size of firms such as employment, annual turnover (sales), value added and pay-roll (or cost of labour), but book values, such as total employed capital, fixed capital, net assets and value of issued capital are the only readily available source of information on a relatively comprehensive basis in Australia. Net assets figures are chosen because they exclude more volatile elements, such as bank overdraft and credit, and in a sense they represent the continuous growth element in the assets of firms.

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(1) T. Barna, 'The Replacement Cost of Fixed Assets in British Manufacturing Industry in 1955', Journal of the Royal Statistical Society, Vol.120, (1957), pp.1-36.

Preference for a particular size measure of firms should be based on the purpose of the study in view, but in practice it should be noted that most of the measures are usually highly correlated with each other and it does not seem to much matter which measure is used.(1) Rank correlation coefficients between three different book values of asset size were calculated for our 402 firms in four periods. The results are shown below:-

Correlations between -	Rank correlation coefficients:- 1950	1956	1962	1967
Total employed capital and net assets	.989	.994	.997	.998
Total employed capital and fixed assets	.946	.953	.987	.986
Net assets and fixed assets	.951	.950	.989	.990

B. Profitability

For several reasons profitability of firms is one of the most difficult economic quantities to measure. Various concepts have been suggested for the measurement of net income from both the accountants' and the economists' viewpoint. Profits are the difference between 'revenue' and 'cost' but these two items are also subject to much controversy as to what should be included in them and how they should be measured.

Concerning the items of revenue and cost, questions are asked whether costs should include the wages paid for managerial work - i.e., 'officers' compensation'; whether, if these wages go to the owners of the firm, they should be considered as profit; whether rent and interest are 'costs' or part of the return on total capital; whether 'capital gains' which arise from the sales of capital assets should be included in revenue.

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(1) See also J. Bates, 'Alternative Measures of the Size of Firms', in P.E. Hart, Studies in Profit, Business Saving and Investment in the United Kingdom, 1920-1962, University of Glasgow Social and Economic Studies, (George Allen and Unwin, 1965), in particular Chapter 8 and Table 8.2.

Many answers have been offered to these and other problems,[1] but the preference for one particular measure over others and the criteria to determine what items should be included in profit depends largely on the purpose of the investigation undertaken, as well as on the availability of reliable statistical data.

Since our object is to compare profitability of firms of different sizes, accounting comparability appears to be the most important issue. Meaningful comparison of 'profits' among firms of varying sizes and over time requires comparable treatment of costs and revenue. In order to avoid any serious distortion caused by different accounting practices between firms, we measure 'profit' by including only those items which are relatively clearly comparable and identifiable in the balance sheets of all the firms studied. 'Profit' thus is measured by 'net profit after tax' which includes trading profits, income from investment and other income including windfall losses and gains, and which excludes provisions for depreciation, other provisions and tax paid (on current income and adjustments for previous years). Post-tax profit is used because in our total 402 firms, only a limited number, mostly larger firms, reported the value of 'tax paid' for the years before 1962.[2] When required in succeeding chapters, however, pre-tax profit is also calculated for this limited number of firms in order to make comparison with the after-tax figures.

Because we are trying to measure some systematic differences between various sized firms' profit performances it is necessary to estimate

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(1) See for example, F. and V. Lutz The Theory of Investment of the Firm (Princeton Univ. Press, 1951), Mathews and Grant, op.cit., Stigler, Capital and Rates of Return in Manufacturing Industries, op.cit., W. Paton, Corporate Profits. Measurement. Reporting. Distribution, Taxation. A Survey for Laymen and Accountants, (Homewood, Illinois: Richard D. Irwin, 1965), and H.J. Sherman, Profits in the United States, An Introduction to a Study of Economic Concentration and Business Cycles, (New York: Cornel Univ. Press, 1968), Chapter I.

(2) The New South Wales Companies Act of 1961 introduced fairly detailed requirements as to the minimum specific items to be shown in company accounts. For details of these legal requirements, see L.C. Voumaid, 'The Victorian Companies Act 1958' in Australian Accountant, Vol.29, (Jan. 1959) pp.3-9.

the total profit of each firm against some base, i.e., some measure of firm size. Sales value is often used as a base and profitability is gauged by the profit rate on sales. This is because different industries utilize the same amount of invested capital to produce very different values of sales and consequently capital turn-over differs considerably from industry to industry. For this reason profit rates on sales may be preferred to other measures in the consideration of a firm's investment and profitability in a given short period such as within one year. But in the longer period of our study, the post-tax profit rate on net capital is a more appropriate measure of 'profitability' of firms. This is because i) the rate which managers would seek to maximize, if they were acting in the owners best interest, would be the post-tax rate of return on net capital assets, and ii) in spite of the differences in rates of borrowing between industries, depending on stability and growth prospects and differences in tax structures, post-tax rates of return on net capital assets are expected to move towards equality between industries.

The rate of return on total employed capital (including borrowed capital) and the rate of return on total capital stock issued are also often used to indicate 'profitability' of firms. The first rate measures the total return on property to indicate the operational efficiency of firms. In this case interest and rent should be included in total profit. The second rate indicates income prospects for shareholders. Both measures diverge from our concept of 'profitability' of firms which concerns, briefly, the inducement to the investors to put more capital into a firm, and particularly the internal profit available for investment by the firm.

Some difficulties remain which are mainly associated with 'capital erosion' effects in times of rising price. In such conditions firms fail to maintain the real value of capital and original capital funds contributed by owners of a firm does not command the same value of stock and fixed assets. With 'capital erosion' profitability measured by net profit on net capital funds will be overestimated since the former

(numerator) is measured by high current prices while the latter (denominator) is based on low historical costs.

In the period we studied this defect caused some serious problems. In order to mitigate the effect of rising price on the 'profitability' measure, we selected and studied 330 firms out of the total 402. These 330 firms appear to have adjusted the value of their assets in response to rising prices. The method of selection of the firms is explained on p.50 above.

CHAPTER IV

GROWTH

The object of this chapter is to examine the relationship between the size and the growth of firms. The chapter consists of four sections. In Section I we consider the empirical investigations into the relationship between size and growth of firms which have been conducted mainly in the last one and a half decades, and briefly review the economic implications of the observed results. In Section II we present a statistical study of the size and growth relationships of those 146 of our 402 firms which operated throughout the whole 18 years studied. The approach is technical and the economic significance of the results obtained are discussed in Section III. In Section IV we discuss the experience of the remaining 256 firms.

SECTION I: Previous Studies of the Size and Growth of Firms.

The association between size and growth of firms has long intrigued economists and several statistical studies have been made, mainly in the United States of America and the United Kingdom.(1) One of the earlier statistical works on this problem dates back to the beginning of 1930's when Gibrat put forward his stochastic hypothesis, the 'Law of Proportionate Effect'.(2) This law states that the probability distribution of growth rates is independent of firm size and the proportionate change in the size of a firm (growth or shrinkage of size) during any period of time is a stochastic phenomenon. Thus it suggests that large, medium and small-size firms have the same average proportionate growth in a given period.

Apart from its intrinsic importance as an explanation of the growth process of firms, Gibrat's hypothesis has several interesting

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(1) For detailed reference to studies on the size and growth of firms, see, for example, P.E. Hart (with two chapters by J. Bates), Studies in Profit, Business Saving and Investment in the United Kingdom, 1920-1962, (London: George Allen and Unwin, 1965), Vol.I, 'List of Works Cited'.

(2) R. Gibrat, Les inégalitiés, économiques, (Paris: 1931).

implications.(1) The first of these has already been noted, i.e. that the growth rate of firms is independent of the absolute size of firms. The second implication is that the dispersion of growth rates around the mean value of growth is also independent of the size of firms; thus it should be the same for large, medium and small size firms. The third implication is that the distribution of proportionate growth-rates is symmetrically distributed around the mean growth, i.e., if x per cent of the total firms double their size, the same percentage of firms halve their size. From this it follows, as a fourth implication, that ceteris paribus the dispersion of the sizes of firms tends to increase over time. In other words, in spite of the fact that large firms have the same average growth rate as smaller firms, the size distribution of firms becomes more unequal over time.

In recent years many writers have studied this problem in order to test and clarify the validity of the basic hypothesis and its related implications. In 1956 P.E. Hart and S.J. Prais conducted a statistical survey of the size distribution and growth of firms with the aim of testing Gibrat's hypothesis.(2) The survey was based on the data of quoted public companies in the United Kingdom for the selected years of 1885, 1896, 1907, 1924, 1939 and 1950. In this study they found that the typical size distribution of firms in an industry (size measured by market value of issued capital) approximated a normal curve on a logarithmic scale. Since, statistically speaking, a normal curve is generated when a large number of small independent random factors act on a variate in an additive manner, a lognormal curve may be regarded as being generated when these independent small random factors act multiplicatively. In an economic context this means that the determinants of the growth of firms change the size of firms by randomly distributed proportions and that there is no tendency for them to act in favour or disfavour of firms of any particular size. Thus Hart

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(1) For further details, see J. Bates, 'Growth and the Size of Firm', Chapter 9 in Hart, op.cit., and P.E. Hart, 'The Size and Growth of Firms', Economica, New Series, Vol.29, (Feb. 1962), pp.29-39.

(2) P.E Hart and S.J. Prais, 'The Analysis of Business Concentration: A Statistical Approach', Journal of Royal Statistical Society, Series A, Vol. 119, (Oct. 1956), pp.150-191.

and Prais found empirical support for Gibrat's hypothesis (which implies this process of equi-proportionate growth).

In 1958 the approach of Hart and Prais was extended by H.A. Simon and C.P. Bonini who argued that although the observed size-distributions of firms often approximate to log-normal distribution, it is also the case that some size-distributions of firms do not fit this simple curve.(1) Simon and Bonini pointed out the importance of the process of new entry into the population of firms in changing the size-distribution from time to time. Basing their study on the ingot capacities of ten leading American steel producers, they claimed that the hypothesis of log-normal size-distribution of firms should be modified. In their view the Yule distribution, which allows for entry of new firms into the business population, is preferable for explaining actual size-distribution. In summary, they suggested that the law of proportionate effect is generally present in the growth of firms, but that some 'birth process' (entry of new firms) is also at work. In order to integrate the birth process into their hypothesis of a Yule distribution they assumed that entry of new firms normally occurred in the smallest size-class.

There are, however, several examples of the establishment of large new firms, especially when they are subsidiaries of foreign enterprises. On the other hand, several studies have noted that we cannot neglect the effect of firms which cease their operations and consequently change the size-distribution of the total business population.(2) It has been suggested that the chances of discontinuation of business firms through liquidation and mergers often decrease with increasing absolute size.(3)

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(1) H.A. Simon and C.P. Bonini, 'The Size Distribution of Business Firms', American Economic Review, Vol.48, (Sept. 1958), pp.607-17.

(2) For example Hart and Prais, op.cit., Singh and Whittington, Growth Profitability and Valuation, op.cit., pp.86-90.

(3) See, for example, R. Ma, 'Births and Deaths in the Quoted Public Company Sector in the United Kingdom, 1949-1953', Yorkshire Bulletin of Economic and Social Research, Vol. 12 (Nov. 1960), pp.90-6.

As we will see later in Section IV this inverse relation between size and likelihood of discontinuation cannot be accepted as a general rule. Unfortunately, due to paucity of published information we do not know much about the relationship between new entry and exit of firms and the size of firms.(1) However, we should at least note here that the effect of new entry and exit of firms demands some modification of the law of proportionate effect which states that the growth rates of firms are independent of their absolute size.

Granted then that the composition of the business population is continuously changing with an uncertain effect on the size-distribution and growth of firms, how far is Gibrat's hypothesis acceptable for 'continuous' firms (i.e. those firms which were in continuous operation throughout the period concerned)?

In 1960 in the United States of America C. Ferguson estimated the rank correlation coefficients between asset size and growth rates of 12 firms in each of 15 American industries for the years 1947-56.(2) He found that in all but four industries the coefficients were very low, indicating that size of firms had little systematic effect on their rate of growth. Similar results were found by several other economists such as S. Hymer and P. Pashigian, and E. Mansfield in the United States of America, and Singh and Whittington, and J. Bates in the United Kingdom.(3) On the other hand, one writer questioned the validity of Gibrat's hypothesis. In his study of 400 British listed public companies, J.M. Samuels showed that

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(1) Only a limited number of works have examined the 'birth and death' processes of firms in relation to their absolute size. It is also unfortunate that because balance sheet information is normally readily available only for quoted public companies, most works have been based on these companies. The majority of both newly established firms and those which fail to continue their operations are not quoted public companies.

(2) C. Ferguson, 'The Relationship of Business Size to Stability: an empirical approach', Journal of Industrial Economics, Vol.9, (Nov. 1960), pp.43-62.

(3) S. Hymer and P. Pashigian, 'Firm Size and Rate of Growth', Journal of Political Economy, Vol.70, (Dec. 1962), pp.556-69, E. Mansfield, 'Size of Firm, Market Structure, and Innovation', Journal of Political Economy, Vol.71, (Dec. 196), pp.556-76, Singh and Whittington, op.cit., and Bates, op.cit.

the hypothesis did not apply during the period 1951-60 and that large firms were growing at a significantly faster proportional rate than small firms.(1)

Ferguson also estimated the rank correlation coefficient between asset size and variation of assets for the same firms over the same period. He found that the dispersion of proportionate growth around the common average was roughly the same for firms in all size groups. This result supports the second implication of the law of proportionate effect noted above (see p.85). However, these findings have been countered by many other studies including those by Mansfield, Singh and Whittington, Bates and Hart.(2) For example, Singh and Whittington found that the dispersion of growth rates (measured by standard deviation of the growth rate around mean value) generally declined with the size of firms, though not regularly.(3)

In 1962 the validity of the third implication of Gibrat's hypothesis was tested by Hart when he examined 1,981 British quoted public companies in the period 1950-55.(4) He found that the distribution of growth rates appeared to tail off fairly symmetrically on either sides of the central tendency (mean value). That is, 722 firms out of the total 1,981 stayed in the same size class, 513 firms doubled in size, 308 firms halved in size, 261 quadrupled in size and 59 fell to one-quarter of their size.(5) He failed, however, to confirm whether this result of rough symmetry is sufficient to justify the third implication of Gibrat's hypothesis which suggests that the distribution of proportionate growth is normal after

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(1) J.M. Samuels, 'Size and the Growth of Firms', Review of Economic Studies, Vol. 32, (April 1965), pp.105-12.

(2) Mansfield op.cit. Singh and Whittington op.cit. and Bates op.cit., and Hart, 'The Size and Growth of Firms', op.cit.

(3) Singh and Whittington, op.cit., p.80.

(4) Hart, 'The Size and Growth of Firms', op.cit.

(5) The distribution of the 1,981 firms by their proportionate growth is as follows:

Proportionate growth (size in 1955/size in 1950)	1/32	1/16	1/8	1/4	1/2	1	2	4	8	16	32	Total
Number of firms	3	6	18	59	308	722	513	261	79	9	3	(1,981)

Ibid., p.34.

logarithmic transformation.

If the third implication is established, inequality of the size distribution of firms must increase. But some empirical examinations do not necessarily agree with the suggestion that the relative dispersion of the size of firms tends to increase over time. I.G. Adelman argues that the size-distribution of firms tends towards an equilibrium position after attainment of which there will be no tendency for its dispersion to change. She suggests that this is because a size-distribution in any year is linked to size-distribution of previous years by a matrix of transition probabilities, a process which may be regarded as an example of a Markov chain. She presented in support of her hypothesis observations on the U.S. steel industry during the period 1929-56 and calculated an equilibrium size distribution which roughly approximated to the observed distribution in 1956.(1)

In summary, we have seen that most previous statistical studies suggested that the average rate of growth is the same for firms of all sizes. However, there was a general indication that not all of the properties of Gibrat's hypothesis are applicable to the growth processes of firms. We can now turn to the examination of the size-growth relationships of our 402 Australian manufacturing firms.

SECTION II: The Association between the Size and Growth of our 146 Continuous Firms.

Our interest in Gibrat's law in this section is primarily confined to its ability to explain growth behavior of firms and so we are not concerned with its (fourth) implication for size distribution of firms *per se*.

In order to avoid the possible distorting effects of entry and exit the firms studied here are 146 companies which were in continuous operation during the entire period, 1950 to 1967. To test the requirements of the law of proportionate effect which states that the average proportionate

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(1) I.G. Adelman, 'A stochastic Analysis of the Distribution of Firms', Journal of the American Statistical Association, Vol.53, (Dec. 1958), pp.893-904.

growth rates are the same for all size groups, we calculated a regression of the logarithm of firm size in 1967 on the logarithm of firm size in 1950. In terms of regression equation the relationship between the sizes of the firm at the two dates is given by

$$\log (\text{net assets in 1967}) = a + b \log (\text{net assets in 1950}).$$

When $b = 1$, this means that for all firms, irrespective of size, the average of the logarithms of proportionate growth is the same. If $b > 1$, the large firms grow proportionately faster, if $b < 1$, the smaller firms grow proportionately faster. The parameter a is a constant term.(1) The size of firms was measured by net asset value at the beginning of each period. The reliability of net asset valuation for the 146 firms was tested by the measure outlined on p 50 above. On this basis it was found that the valuation of the great majority of these firms (135 out of 146) appears to be relatively reliable.(2) The result of the regression analysis is shown in Table 4.1 below.

In the table we find that $b > 1$ at a statistically acceptable level (significant at less than the 5 per cent level) in the majority of industries as well as in the aggregated 'All-industries' group. A reverse relationship $b < 1$, is observed in the textile industry (industrial group 5) in the first sub-period, but the relationship appears to be extremely weak and statistically insignificant at any acceptable level. Thus, based on our observation in Table 4.1 we found that among our 146 firms the larger ones grew faster than the smaller during the period 1950 to 1967.

The same relationship between initial and closing sizes (sizes in 1950 and 1967) is shown graphically in Figure 4.1 by plotting the average size of each size group (there were no firms which fell into size groups 12 and 13 in 1950, i.e. net assets exceeding £51,200,000) It indicates a rough linear relationship between the 1950 and 1967 sizes.

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(1) Regression analysis of size relationship between two dates is used by Bates and others. For a detailed explanation of the analysis, see for example, J. Bates, op.cit., pp.150-180.

(2) It is often suggested that larger firms revalue their assets more frequently than smaller firms. If this is usually the case it will cause a systematic bias towards overestimation of growth rates in the larger firms group.

Table 4.1

Spearman's Rank Correlation Coefficients between Average Growth Rates and Opening Size of Net Assets : 1950-67

146 Continuous Firms

Industrial[1] Group	1950-55	1956-61	1962-67	1950-67
1 Cement	.32	-.70*	-1.00+	-.20
2 Chemicals, etc.	-.54	.11	.64**	-.14
3 Iron and Steel, etc.	.50	.15	-.32	.29
4 Electrical Engineering	-.77**	-.40	-.80*	-.94***
5 Textiles, etc.	-.58	-.19	.62	.23
6 Saw mills, etc.	.09	.43	1.00+	.60*
7 Food, Tobacco, etc.	-.62**	-.38	.38	-.22
8 News papers	.26	-.54	.77**	-.49
All industries	-.72**	-.17	.85***	.31

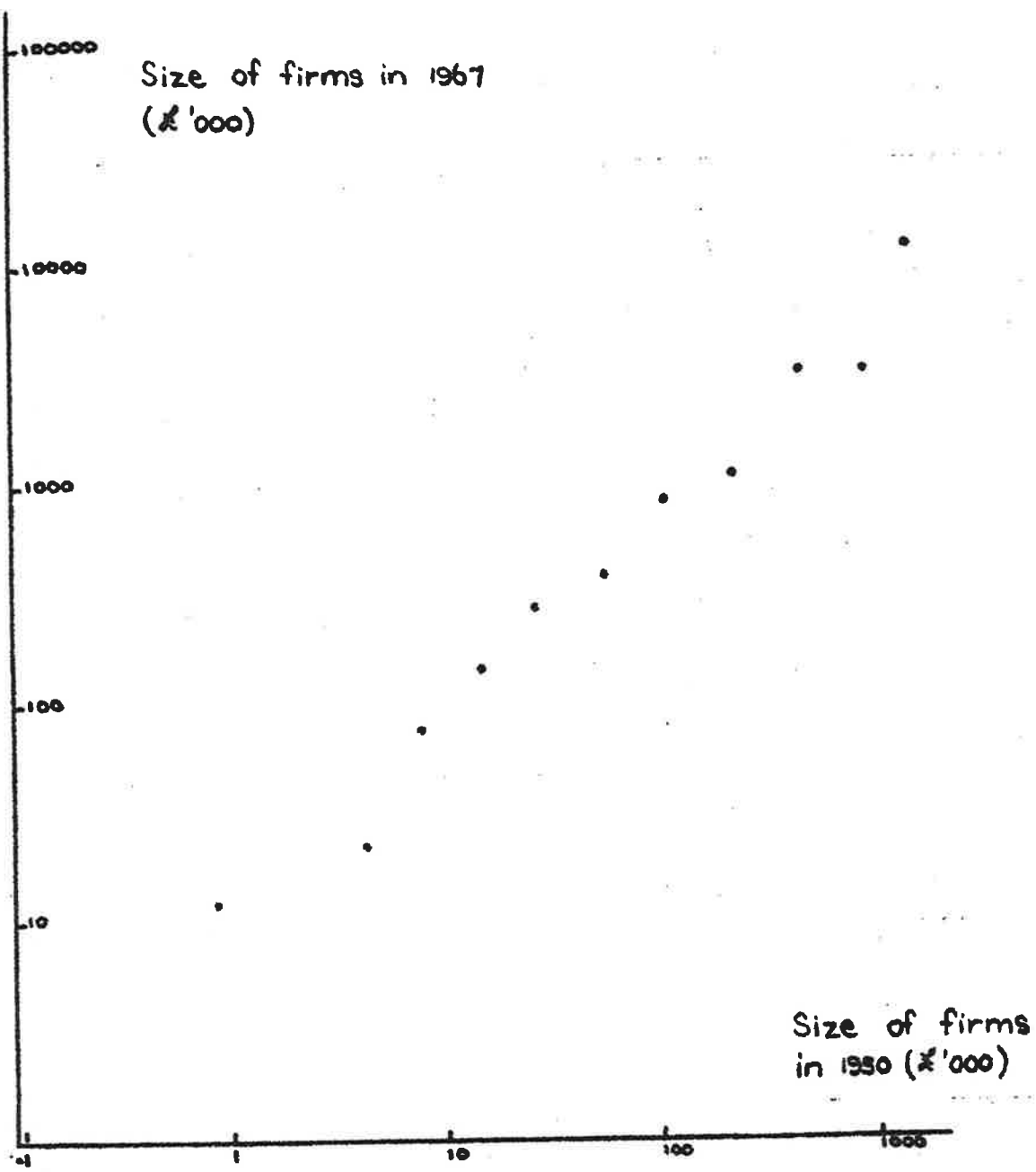
* Significant at the 10 per cent level
** Significant at the 5 per cent level
*** Significant at the 1 per cent level
\+ Perfect correlation

Note (1): See Appendix C.

Source: From Appendix Table F.1 ~~at the end of this chapter.~~

Figure 4.1

Regression of Firm Size in 1967 on Firm Size in 1950 : 146 Continuous Firms (logarithmic scales)



Before we attempt to offer any hasty verdict on the validity of the law of proportionate effect, we will proceed to examine the second implication of the law. In Appendix Table F.1 at the end of this study we find, in contrast to the average growth rates, quite considerable difference in dispersion of growth rates between different size classes in almost every industrial group. At first glance this dispersion of growth rates (measured by standard deviation around average growth rates) appears to vary with size. But further careful observation tells us that the dispersion of growth rates does not decline continuously with size; that is, although large firms (size groups 9 and over) have more uniform rates of growth than firms of smaller sizes, the largest dispersion is often seen among firms of the medium size groups (size groups 5-8) in each industry.(1)

Such observations conflict with the second implication of the law of proportionate effect, but they agree with our commonsense economic expectations. On a priori grounds, we would expect that the smaller firms often grow extremely fast when market prospects are good, and shrink, or stop growing, in adverse conditions. On the other hand, large firms rarely shrink in size and they also less frequently achieve spectacular growth rates. This could partly be attributable to the common characteristics of most large firms, for example wide diversification of products. We are still left with the problem of why medium size firms, rather than the smallest firms, have the largest dispersion of growth rates. The answer is sought in the last section of this chapter.

The third implication of Gibrat's law is that the distribution of proportionate growth rates of firms tends to be symmetrically distributed around the mean growth rate. From Appendix Table F.2 , we compiled Table 4.2 below in order to show the distribution of our 146 continuous firms by average growth rates over the 18 years studied.

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(1) A similar observation is reported by Singh and Whittington, op.cit., p.80.

Table 4.2

Distribution of 146 Continuous Firms by Growth Rates of Net Assets, 1960-67.

Growth rate per annum (%)	No. of Companies	Percentage distribution of companies (%)
less than 5.0	19	13.0
5.0 - 9.9	46	31.1
10.0 - 14.9	38	26.8
15.0 - 19.9	24	16.2
20.0 and over	19	12.8
Total	146	100.0

The annual average growth rates of net assets range from -2.0 per cent to 100.5 per cent among our 146 continuous firms, but the majority of the firms grew at a rate between 5 to 20 per cent per annum (see Appendix Table F.2). The frequency distribution is neither normal nor log-normal in any strict sense, but as Table 4.2 indicates it is roughly symmetrical suggesting that around the common average growth rate of 10.1 per cent, about 30 per cent of the total population grew at more than 5 per cent below average, while 26 per cent of the firms grew at more than 5 per cent above average growth rates. The remaining firms with extreme growth rates also appear to tail off fairly symmetrically on either side of the central tendency.(1)

So far we have examined the first three implications of the law of proportionate effect. Our observations for the 146 Australian manufacturing firms are found not to be consistent with the law. We found that large firms in general have a tendency to grow faster than smaller ones, and that large firms have more uniform growth rates than firms in smaller size groups. These statistical observations are not consistent with Gibrat's hypothesis.

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(1) From the information given in footnote(2) on p.49 of Chapter III, we may guess that prices for fixed capital assets rose at 3½ to 5 per cent per annum in the period between 1950 and 1967. If those percentage figures are acceptable, we may suggest that in real terms about 13 per cent of the total 146 firms shrank in size while roughly the same proportion of firms expanded their net assets by more than 15 per cent per annum throughout the 18 years ended in 1967.

However, unlike previous writers who have examined the law of proportionate effects, we feel that it is insufficient to weigh the hypothesis on statistical grounds alone. It is also essential critically to examine the economic implications of the law.

The basic rationale of supporters of Gibrat's Law may be summarized as follows.(1) The law of proportionate effect suggests that large, medium and small size firms have the same average proportionate growth in a given time period. This may imply that the chances of growth or shrinkage in the size of each firm will depend on the quality of its management, on the taste of its consumers, the range of its products, the availability of materials and capital funds, the economic climate, political conditions, technical development and so on; but the influence of these factors may account for a relatively small part of the proportionate growth of firms. There may be a long list of causes other than those named above, some making for growth, some for decline, but together acting randomly on the size of firms. The combined effect would yield a probability distribution of the rates of growth or decline for firms of each given size and this probability distribution is the same for all size classes of firms. We may call such an approach formulated in Gibrat's hypothesis as a 'stochastic explanation' because it emphasizes the importance of stochastic elements in the determination of growth of firms.

It is widely observed that the complex of economic and political forces which influence a firm's growth is ever growing as economic systems and economic frameworks become more sophisticated. Thus it is extremely difficult to ascertain the most important factors which generally determine the growth of firms. Yet despite this, we are not persuaded by purely stochastic explanations. Further study of possible explanatory factors of the growth of firms must be undertaken and the next two sections are devoted to this task.

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(1) The following summary is largely based on Singh and Whittington, op.cit., p.73, and Hart, 'The Size and Growth of Firms', op.cit.

SECTION III: 'Fastest-growing' and 'Slowest-growing' Firms

In Appendix Table F.2 we see that during the 18 years between 1950 and 1967, the average annual growth rates of each individual firm ranges from -2.0 per cent to 100.5 per cent among the 146 continuous firms. Even excluding one extremely fast growing firm, News Ltd., the differences in growth rates still exceed 40 per cent from -2.0 per cent to 40.6 per cent. We have found that large firms as a group appear to possess advantages in expansion of their size over smaller firms. We should, however, note that the differences of average growth rates between large, medium and small size groups were not as large as those observed between individual firms. In Appendix Table F.1, we find rather small differences in mean growth rates between the 13 size groups. They range from the smallest value of 8.2 per cent in size group 2 to the largest of 12.3 per cent in size group 11. The size differences of firms appear to explain only a small part of difference in growth between individual firms. How far then can we explain this wide range of growth rates of individual firms by differences in firms' products and differences in the market structures in which they operate?

In Tables 4.3 and 4.4 below we show the average growth rates and their variances (measured by standard deviation around the common mean value) of firms in the eight major industrial groups, and seven different concentration groups over the whole period 1950-67.

The largest inter-industry difference in growth rates of firms is seen between the cement and textile industries; firms in the former grew more than twice as fast as those in the sluggish textile industry. In spite of this, the inter-industry differences in average growth rates are not large enough to explain the observed considerable differences of growth rates between individual firms. In the textile industry group, for example, Valley Worsted Mills, Onkaparinga Woollen Co., Western Australia Worsted and Woollen Mills, and Ballarat Woollen and Worsted Co. are all engaged in manufacturing wool textiles but the growth rates of their net assets differ considerably in the 18 years studied. The first three firms increased their net assets by 16 per cent, 11.1 per cent and 5.9 per cent per annum

Table 4.3

Average Growth Rates per annum and the Variances:
146 Continuous Firms, 1950-67
Industrial Groups

Industrial groups (1)	No. of companies	Average growth rates per annum (%)	Variances of growth rates (%)
1 Cement, etc.	10	15.5	5.1
2 Chemicals, etc.	14	14.2	6.7
3 Iron and Steel, etc.	19	13.2	4.4
4 Electrical Engineering	12	13.6	3.8
5 Textiles, etc.	44	5.4	4.1
6 Saw mills, etc.	12	9.9	3.9
7 Food, Tobacco, etc.	24	10.1	5.4
8 Newspapers	11	10.8	6.4
All-industries	146	10.1	5.9

Table 4.4

Average Growth Rates per annum and the Variances:
146 Continuous Firms, 1950-67
Concentration Groups

Concentration groups (2)	No. of companies	Average growth rates per annum (%)		Variances of growth rates (%)
1 Monopolistic and oligopolistic industries	12	9.8		2.5
2 High-oligopolistic industries	27	11.6	Average 11.5	7.7
3 Moderate-oligopolistic industries	29	11.5		6.0
4 Low-oligopolistic industries	23	13.1		4.3
5 Unconcentrated industries	34	7.6		5.8
6 Competitive industries	5	10.4	Average 8.4	2.8
7 High competitive industries	16	7.0		3.2
All-groups	146	10.1		5.9

Notes: (1) See Appendix C
(2) See Appendix C

respectively while the remaining firm's net assets in fact decreased by 2.0 per cent per annum during the period. The size of these four firms' net assets are not very different, being £733,000, £348,000, £430,000, and £248,000 in 1950 respectively. Let us quote another example. In paper making both Tasmanian Board Mills and Cellulose Australia are relatively small[1] firms in the industry with their net assets of £631,000 and £474,000 in 1950 respectively, and they both manufacture paper boards of similar nature. Yet the former managed to increase its net assets by only 7.5 per cent per annum while the latter expanded nearly twice as fast at 14.0 per cent per annum during the 18 years ended in 1967. As for differences in market structure, both British Tobacco Co. and General Motors - Holden are oligopolists dominating their principal markets with market shares exceeding 50 per cent of the total. Yet the former expanded its net assets by 7.5 per cent per annum, while the latter achieved a 32.6 per cent annual growth rate over the same 18 year period. In short, the larger part of the observed differences in average growth is attributable to the differences in growth performances between individual firms in each industry, and is not due to their general trading prospects nor to any market control that they may possess, nor to their absolute size.[2]

In Appendix Table F.2 our 146 continuous firms are listed according to their average growth rates over the period between 1950 and 1967. We have already observed in the previous section that the distribution of these firms by growth rates is symmetrical around the mean rate of 10.1 per cent. The 19 fastest growing firms whose annual growth rates exceed 20 per cent contrast with an equal number of slowest growing firms whose growth rates are below 5 per cent per annum.

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(1) In absolute terms they fall into our 'medium' size category.

(2) A similar observation is reported by Barna in his study of 74 British manufacturing firms for the period between 1949 and 1959. Barna, Investment and Growth Policies in British Industrial Firms, op.cit. A detailed discussion of the causes of differences in profit and growth performances between individual firms will be presented in the last chapter of this study.

Let us first focus our attention on these firms in the two extreme groups, and then extend our examination over the rest of the firms which we will call the 'middle' firms. Are there any factors, the presence of which made the first 19 firms grow at such rapid rates, and the absence of which on the other hand, was responsible for the other 19 firms' poor growth performance?

1) Despite the fact that average growth rates do not differ considerably between concentrated and less concentrated industries, it is noticeable that 16 out of the 19 fastest-growing firms are oligopolists (operating in concentration groups 2-4 inclusive). Among the slowest-growing firms the ratio is roughly reversed and 14 out of these 19 firms are operating in less concentrated industries (concentration groups 5-7 inclusive). Concentration ratios do not seem, however, significant in the ranking of the middle firms.

It is important to note that six of the 19 fastest-growing firms were operating in industries where market concentration increased during the 18 years studied. In fact these six companies were, through their acquisitions of other firms in their industries, one of the causes of the increase in concentration ratios. Five of the six were oligopolists.(1) Another six firms,(2) all oligopolists, undertook considerable product diversification in both vertical and horizontal directions. In addition there are two more oligopolistic companies which both acquired other firms and diversified their activities.(3) Although it is difficult to generalize about differences in the nature and direction of investment decisions of firms in different concentration groups our observations here roughly indicate that a growth maximization policy(4) appears to be more

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(1) They are Life Savers in biscuits, etc. manufacturing, S.A. Rubber in rubber products, M.B. John in electric machinery, Union Carbide in industrial chemicals, Carpet Manufacturers in carpet making. The sixth firm was Borg-Warner in automobile parts manufacturing.

(2) They are Allied Mills in flour manufacturing, Chrysler and G.M.H. in automobile manufacturing, Blue Metals in cement and cement products, Boral in petroleum refining and Simpson-Pope in electric appliances.

(3) They are News Ltd. in the newspaper industry, and Petersville in ice-cream manufacturing.

(4) For definition of this term, see pp.132-3 below.

frequently found among oligopolistic firms. In order to grow faster than the average rate of sales expansion in their principal market oligopolists, who are already large relative to their market, often acquire other rival firms, and expand into other prosperous fields.

2) In order to measure the extent of the contribution of mergers to growth, the size of firms acquired should be measured on the same basis as the size of our sample firms, i.e. by value of net assets. Unfortunately such information is extremely hard to obtain unless the acquired firms are also listed public companies. Since quite a number of firms which were taken over by our firms were not listed public companies the only available estimate of their value on a comprehensive basis is the amount paid either in cash, or by exchange of shares (i.e., the market value of the shares offered).(1) In the case of the exchange of shares an additional complication arises in determining the real market value of shares offered. The market value fluctuates from time to time because of chance factors and speculation - which is often stimulated by the take-over bid itself. Hence there arises the problem of deciding which date should be chosen for the valuation of the market price of shares; before the take-over bid is made, at the time when the shares are actually exchanged, or some other time between? In practice it is difficult to discover relevant dates. In order to avoid any serious underestimation or overestimation of the market value of shares exchanged, we used an average of the highest and lowest prices recorded in the calendar year when acquisition was made.

In Appendix Table F.2, column 9, we show the percentage proportion of growth of net assets contributed by acquisition. Such percentage comparisons of the value of acquisition at the time of take-overs with the total net asset growth of the firms over the 18 years usually underestimate the true extent of the contribution of take-overs. This is because the acquired subsidiaries would normally have grown pari passu with

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(1) For a detailed discussion of the pros and cons of alternative methods of valuing mergers, see Bushnell, Australian Company Mergers 1946-59, op.cit., particularly pp.10-25, and 107-12, and J.F. Weston, The Role of Mergers in the Growth of Large Firms, (Univ. of California Press, 1953), Chapter 2.

the rest of the firms during the period. Perhaps we may even expect the newly acquired part of a firm to grow faster than the rest of the firm when take-overs were made in order to expand into a new market.(1)

During the period 1950-67 the absolute value of acquisitions by our 146 firms amounted to £187m. representing 11.5 per cent of the growth of total net assets. Among the 19 fastest-growing firms all but three acquired at least one other firm and in fact many of them took over several firms during the period. As a result mergers contributed one quarter of their net asset growth. In contrast, among the 19 slowest-growing firms only two were involved in merger activities. Although it is by no means general or systematic there also seems to be a tendency among the middle firms for more frequent acquisitions by firms with relatively faster growth rates.

Mergers are most frequently seen in the fastest-growing firms but we cannot conclude from this that firms are able to grow rapidly solely because they acquired other firms. Mergers cannot, for example, explain how Borg-Warner (Australia), North Australia Cement and General Motors-Holden's grew so fast for these firms made no acquisitions during the period. Further study is required before we can provide comprehensive reasons for the growth of firms. At present we simply suggest that acquisition is an observed characteristic of many fast growing firms (and lack of it a characteristic of the slowest growing firms).

3) In the previous chapter we found that there was a persistence of profit rates over a number of years. A similar approach was used to examine whether firms which grew rapidly in a sub-period (six years) continued to do so in the following sub-period, and whether, on the other hand, firms which grew slowly in one sub-period also showed relatively poor results in the subsequent six-year period.

Regression coefficients of annual average growth rates of net assets between one sub-period and the following sub-period were calculated

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(1) There may also be cases where acquisitions cause a decline in the overall profitability of a firm. Bushnell reported Cox Bros. (Aust.) Ltd. and Holeproof Ltd. as two firms whose growth was adversely affected in this way. Bushnell, op.cit., p.117.

for the 146 continuous firms on the basis of each industrial group as well as for the 'All-industries' group. The results are shown in Table 4.5 below.

Unlike profitability, we found no strong relationship between average growth rates in any of the two periods for the 'All-industries' group. This indicates that in most cases relatively successful growth performances in one sub-period was not followed by similar successes in the subsequent five-year period. Moreover slow-growing firms in one sub-period often managed to improve their growth rates in the following sub-period.

However, the extent of growth persistence differs considerably within each industrial group. Relatively strong relations are found in the Newspaper industry in average growth rates between 1950-55 and 1956-61, and 1956-61 and 1962-67. Statistically speaking, in this industry the growth in the first sub-period provides 59 per cent of the explanation ($r^2 = 0.59$) of the variance of growth in the second sub-period, and similarly the percentage is 29 ($r^2 = 0.29$) between the second and the third sub-periods. In addition to this, growth persistences, although weaker than that in the Newspaper industry, are observed in the Cement, Iron and steel, and Electrical engineering industries between the first and second sub-periods, and in the Saw mills, etc. industry between the last two sub-periods. On the whole, as we have already noted, persistences of average growth rates of firms are not strong in comparison with those of profit rates in any of the individual industries.

Turning from the total 146 firms to the firms in the two groups of extreme growth rates, we made an important discovery. It is observed that the persistence of growth rates is particularly strong among the 19 fastest-growing firms. In fact all but four firms in this group grew at rates well over 20 per cent per annum throughout two subsequent sub-periods.(1) What

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(1) The four exceptions are Warburton Franki, Chrysler Australia, North Australian Cement and General Motors-Holden's.

Table 4.5

Results of Regressions of Net Assets Growth, 146 Continuous firms

i) growth in 1956-61 on that of 1950-55
ii) growth in 1962-67 on that of 1956-61

Regression coefficient r^2

Regression equation : $g_{t+1} = a + gb_t + \epsilon$

where a and b are constant terms
ϵ, the standard error term
g, growth of net assets (%)
t, 1950-55 in Column (i)
1956-61 in Column (ii)
t+1, 1956-61 in Column (i)
1962-67 in Column (ii)

	(i) Regression of Net Assets Growth in 1956-61 on that of 1950-55				(ii) Regression of Net Assets Growth in 1962-67 on that of 1956-61			
	r^2	a	b	ϵ	r^2	a	b	ϵ
8 major industrial groups (1)								
1 Cement, etc.	.13	18.48	-.42	5.72	.05	11.15	-.09	2.46
2 Chemicals, etc.	.01	11.65	.13	3.03	.01	10.07	.08	2.13
3 Iron & Steel, etc.	.26	14.02	-.56*	2.65	.01	9.35	-.06	2.42
4 Electrical engineering	.28	17.21	.56+	2.55	.01	4.99	-.04	1.32
5 Textiles, etc.	.00	5.59	-.001	.85	.06	-.08	.33	1.25
6 Saw mills, etc.	.02	10.02	-.15	2.43	.17	1.90	-.18	1.39
7 Food, Tobacco, etc.	.02	10.74	.12	1.37	.05	4.10	.20	1.29
8 Newspapers	.59	13.61	-.98*	4.20	.29	5.97	.21+	1.47
Concentration groups (2)								
1 Monopolistic & duopolistic industries	.17	13.07	-.94	2.69	.07	4.78	-.13	1.29
2 High-oligopolistic industries	.01	10.33	.04	1.40	.03	7.10	.30	2.34
3 Moderate-oligopolistic industries	.01	14.61	-.10	3.06	.01	6.88	.04	1.26
4 Low-oligopolistic industries	.10	13.98	.44	2.07	.0001	5.05	.01	1.36
5 Unconcentrated industries	.01	7.76	.08	1.53	.13	1.28	.33*	1.41
6 Competitive industries	.09	7.36	-.19	2.44	.37	8.77	.39	2.79
7 High-competitive industries	.13	5.99	-.18	1.30	.003	1.18	.04	1.09
All-industries	.001	11.01	-.03	.86	.04	4.62	.16	.70

* Significantly different from zero at less than the 5% level.
\+ Significantly different from zero at the 10% level.

Notes: (1) See Appendix Table C.1
(2) See Appendix Table C.2

is more, several of them grew continuously over the whole three sub-periods at rates as fast as 20 per cent per annum. In contrast to this the poor growth performances of all the 19 slowest-growing firms persisted throughout at least two sub-periods.

Let us briefly recapitulate our discussion in this section. We have observed that there are large differences in annual growth rates between our 146 continuous firms. Only a small part of the differences seem to be attributable to the differences in the absolute size of the firms or to the industries and the market structures in which they operate. A large part of the differences is between individual firms operating in comparable situations. What are the comparable situations? We have divided our 146 firms into three broad categories; fastest-growing, slowest-growing, and middle firms. The majority of the fastest growing firms operated in oligopolistic markets, and a substantial part of their growth was brought about by acquisitions of other firms. It is, however, important to note that in most cases acquisitions are not the sole cause of such rapid growth. Most fastest-growing firms were involved in mergers, but even excluding growth caused by acquisitions they would certainly still rank in the list of rapidly growing firms. These firms grew continuously over a number of years (two sub-periods or longer); a part of their growth was derived from take-overs, but the rest must be attributed to internal growth. The slowest-growing firms offer contrasts in every respect. They operated mostly in less concentrated industries, were involved in practically no merger activity and their poor growth performance was continuous, persisting over at least two sub-periods.

This last aspect concerning the growth persistence of firms carries very important implications. Unlike profitability most of our firms do not usually maintain continuously higher (or lower) growth rates over a number of years. Growth seems to be a less continuous process than profit. A firm may undertake an expansion programme in one year and it may last a few years as a 'carry-over' process, but the growth process of

the firm then often ceases until the next expansion scheme commences.(1) Firms such as those in our fastest-growing group which have a high growth rate persisting over a number of years must have launched, with only a short interval, into one expansion scheme after another.

It is of course possible to argue that differences in growth experience between firms are due to chance elements. Some firms may continuously succeed in expanding their size and market by sheer luck. However, luck is unlikely to persist and given the strong growth persistences observed among firms in both fastest- and slowest-growing groups, we are convinced that chance factors are only marginally important in determining the growth of firms. Thus, we are led to believe that the differences in growth rates between individual firms are mainly attributable to a systematic cause or causes which exist within each firm. Although general economic conditions external to firms influence their success and failure in making profits and expanding their size, it seems that it is internal factors within individual firms which initiates the difference in growth experience of individual firms. We may roughly call such internal factors, 'managerial' differences.(2) The speed and extent of utilization of expansion opportunities appear to differ considerably between firms in comparable situations, e.g. firms of same size, and/or same industry, and/or similar market structure. Such differences are caused by the varying quality of management. We do not, therefore, accept stochastic approaches of any form as an explanation of the growth of firms.

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(1) A firm which grows fast in one year is likely to grow relatively fast in the following year. Expansion schemes may not be completed within a year, and effects of associated innovation, re-organization, etc. may last more than one year.
An integration of such 'carry-over' effects into stochastic models embodying various forms of the law of proportionate effect is proposed by Y. Ijiri and H.A. Simon 'A Model of Business Firm Growth' Econometrica, Vol.35, (April 1967), pp.348-55.

(2) In the present discussion the term 'management' includes the whole body of decision making of a firm. It thus encompasses not only executives and top management, but also, where relevant, the group of people who are called 'technocrats' by Galbraith. See Galbraith, The New Industrial State, op.cit. A further discussion of managerial contributions is presented in Chapter VI below.

The importance of the role of management in the growth of firms is further confirmed by our study in Section IV of firms entering and leaving our sample.

SECTION IV: 'Critical point(s)'

Out of the total 402 firms which are included in our study, 113 firms discontinued their activities during the period 1950-67 either through liquidation, take-over or some other reason. At the same time 143 firms entered our sample by obtaining quotation on the Sydney Stock Exchange.(1) In Table 4.6 below the size distribution of the total 402 firms is shown grouped into three categories of continuous, discontinued and newly entered firms.

In this section we examine the relationship between size and growth of firms in the groups of discontinued and newly entered firms.(2) Our main purposes here are to find whether the stochastic explanations described in Section II can acceptably account for the growth processes of the firms in those two categories. If not, we must ascertain what are the most important factors which allow firms to enjoy sustained growth, or which induce them either to accept takeover offers or to liquidate their assets. In the case of newly entered firms, we will also ask why they were converted into listed public companies.

In their study of British firms referred to above Singh and Whittington observed that the size of new firms (newcomers to the British stock exchanges) is usually considerably smaller than that of already listed

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(1) Eleven discontinued firms were also new additions to the sample after 1950. To avoid double counting these firms are not included in the group of the 143 newly entered firms. See p.9 above.

(2) It should be noted that our study of newly entered and discontinued firms included in Table 4.6 must be an imperfect analysis of the birth and death processes of firms. Our 143 newly entered firms include only those which were newcomers to the Sydney Stock Exchange list some time between 1950 and 1967. They include, therefore, firms which already had a business history before being listed. On the other hand, the 113 discontinued firms in our sample were delisted from the Sydney Stock Exchange during the period mainly because of take-overs and liquidation. However, our discussion of discontinued firms is handicapped by the lack of data concerning non-listed firms.

firms, and also that small firms are more subject to discontinuation.(1) Our study indicates, however, that neither discontinued firms nor new firms are confined to small size groups. In fact their size ranges rather widely (see Table 4.6 below).

Looking first at the 113 discontinued firms we find that 48 had very poor business records. They were either very slow growing firms the net assets of which never increased by as much as 5 per cent per annum, or those which, while managing to grow between 5 per cent and 10 per cent per annum, mostly earned profit rates below the average of our 402 firms and which, moreover, failed to make a profit at least once in their years of operation. In fact in most of the latter cases the firms made a loss more than once. General explanations for liquidation or the acceptance of takeover offers by these 48 firms may therefore be sought in their business difficulties.

Business records as quoted public companies are extremely brief for six of the remaining discontinued firms. They entered our sample after 1950 by obtaining quotation in the Sydney Stock Exchange, but were delisted when acquired by other firms before 1967. Among other reasons, it is possible to assume that these six firms obtained quotations in the Exchange in order to find suitable buyers.

The remaining 59 firms had relatively satisfactory business records until the date of their acquisition. They managed to make continuous profits almost every year which often exceeded the average of our 402 firms, and also to expand their net assets at annual rates higher than 5 per cent; in fact all but ten firms expanded their net assets at rates exceeding 10 per cent per annum (see Table 4.8 below). Why then did they give up independent operations? Many reasons have been suggested as possible explanations for mergers.(2) What were the most important factors

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(1) Singh and Whittington, op.cit., pp.86-90.

(2) See, for example Bushnell, op.cit., Chapter II, and J.K. Butters, J. Lintner, and W.L. Cary, Effects of Taxation - Corporate Mergers, (Cambridge, Mass.: Harvard Univ. Press, 1951).

Table 4.6

Size Distribution of 402 firms; Continuous, Discontinued and Newly-entered firms. 1950-67

Size Classes(1)	Number of Continuous Companies		Number of Discontinued Companies		Number of New Companies	
	Size in 1950	Size in 1967	Size in 1950	Size when it discontinued	Size at the time of entry	Size in 1967
1	4	..	1	4	..	..
2	8	3	6	1	2	..
3	15	5	26	17	18	4
4	32	10	39	21	32	12
5	31	16	25	25	49	32
6	25	15	10	21	10	29
7	10	27	5	13	18	26
8	11	20	1	9	8	24
9	6	20	..	1	3	8
10	2	15	..	1	2	6
11	2	7	..	..	1	2
12	..	5	..	..	..	..
13	..	3	..	..	..	..
Total	146	146	113	113	143	143

Note: (1) See Appendix Tables D.1 - D.4

influencing this group of firms with relatively satisfactorily business records to accept take-over offers?

One clue may be obtained from their size and growth structures which are shown in Tables 4.7 and 4.8. In these two tables we see that the majority of these 59 discontinued firms are of 'medium' to 'small-large' size with net assets between £400,000 and £12,800,000 (size groups 5-9 inclusive) at the time of acquisition. Mostly they began as smaller firms with net assets of less than £400,000 in 1950. Because of their relatively rapid growth they moved by the time of acquisition into the medium to small-large size groups which seems from Tables 4.7 and 4.8 to experience particular difficulties. Of course we have seen that several of our 146 continuous firms successfully managed to grow continuously and to eventually shift from medium or small-large size groups to higher size categories.(1) Some firms were fortunate enough to grow from small to large size firms, but quite frequently some others appeared to encounter difficulties when they reached the medium to small-large size ranges and were unable to sustain their independent growth further. Why?

Penrose makes important suggestions concerning the possible reasons for acquisitions and mergers,

> '. . . growth is not for long, if ever, simply a question of producing more of the same product on a larger scale; it involves innovation, changing techniques of distribution, and changing organization of production and management. Accounting control and budget-making and forecasting techniques must be refined and adapted to replace many of the quasi-instinctive judgements of one or two individuals that may predominate in the simpler form of organization suitable for small-scale operations. Tax calculations become more complicated and tax experts may have to be hired; if invention and innovation are important, patent problems arise and a special staff of patent experts may be called for; labour and personal relations may require the creation of a specialized personnel section. There is no need to elaborate the details: the growing small firm inevitably reaches a <u>critical point</u> where the managerial services appropriate for the efficient organization of production and distribution on a small scale are no longer sufficient . . . The additional managerial resources required to set up and control a more complicated administrative organization can of course be hired, but for the transformation in the structure of the firm to take

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(1) From Appendix Table F.3 we are able to calculate that there are 59 firms which were small in size (size groups 1-4 inclusive) in 1950, and which continuously grew over the 18 years. Of these, only 2 firms grew very rapidly and moved into large size groups (size groups 10 and over) by 1967. Similarly, of the 83 firms which were in the medium to small-large size groups (size groups 5-9 inclusive) in 1950, 24 firms moved into the large size groups by 1967.

Table 4.7

Size Distribution of Selected 59 Discontinued Firms: 1950 and last operating years

Size Class(1)	Size in 1950	Size in last operating year
1	..	..
2	5	..
3	9	3
4	21	8
5	15	2
6	4	15
7	4	10
8	1	10
9	..	9
10	..	1
11	..	1
12	..	..
13	..	..
Total	59	59

Note: (1) See Appendix Table D.5

Table 4.8

Distribution of Selected 59 Discontinued Firms by Growth Rates of Net Assets per annum

Growth rates per annum (%)	Number of Firms with Net Assets -	
	exceeding £400,000	£400,000 and less
5.0 - 9.9	10	..
10.0 - 19.9	22	8
20.0 and over	16	3
Total	48	11

> place an understanding of what is happening and what is needed, and a willingness to accept substantial changes in the old ways of doing things are required of the original management.'(1) (My italics)

Thus when a firm reaches this 'critical point' it should reorganize itself introducing substantial changes in management, financial structure and other important aspects of its organization so as to operate efficiently through the transformation process of moving from the 'small' into the 'large' size categories. Otherwise, it has either to stop growing, or to become gradually more inefficient, or to accept a takeover offer.

A similar line of thought was suggested earlier by Robinson when he described the 'pessimum size' of a firm which 'combines the technical disadvantages of smallness with the managerial disadvantages of being too large for individual "control"'.(2)

In Australia firms usually appear to reach this 'critical point' or 'pessimum size' in two ways. Many owner-managed businesses or partnerships grew so rapidly with the general expansion of the economy during the post-World War II period that their managers were unable to cope with the increased complexity of production techniques and administration.(3) Some other firms find their operation size too small to obtain economies of scale by specializing in limited ranges of products, but their management capacity is insufficient for an expansion from local markets to the national market. In most cases in Australian manufacturing industry these two disadvantages of smallness are combined and the easiest and quickest answer is often negotiation of a merger with another company.

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(1) Penrose, op.cit., pp.161-2.

(2) Robinson, The Structure of Competitive Industry, op.cit. pp.105-6.

(3) Bushnell suggests that most owner-managers in Australian manufacturing industries only have training and experience in the technological aspects of their work and not in management. Bushnell, op.cit., p.49.

Turning now to newly entered firms, we see in Table 4.6 a concentration of relatively large numbers of firms in the medium to small-large size groups (size groups 4-8 inclusive) at year of entry.(1) An explanation for such a size distribution may again be sought in the particularly strong demand for management in firms of medium to small-large size groups. Of the total 143 new firms 117 may be classified as medium and small-large firms (initial size groups 4-8 inclusive). We have already noted that most of the newly entered firms had already been in operation for some years.(2) As they grew and reached the 'critical point' they required a well rounded management team in order to jump over, or rush through, the pessimum point and sustain growth. Obtaining quotation on the Sydney Stock Exchange and moving from owner control towards management control may be one sign of internal re-organization.

Concerning the 'pessimum size', Robinson suggests that in several industries there are two sizes '. . . which can be regarded as optima, separated by intervening sizes which seem to be less efficient than either of the two optima',(3) and in some other industries there may be a number of minor optima and one large major optimum. We do not know exactly at what size firms do reach the 'critical point'. Neither do we have, at present, any information to indicate if there is more than one single 'critical point' in manufacturing industries in post-war Australia. However, from our study we may at least suggest that 1) most firms certainly reach a critical point where a change in managerial structures, inter alia, must take place, and 2) such a point appeared to become of critical

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(1) Size was measured at the last operating years for discontinued firms, and at the year of entry for newly entered firms. Since discontinuation and new entry occurred almost every year between 1950 and 1967, the size of these two groups of firms are not strictly comparable. We classified firms which were in size groups 5-9 inclusive in 1967 as 'medium to small-large' firms. However, since a firm of given size might be regarded as relatively larger in earlier years than a firm of the same size in 1967 we classified as 'medium to small-large' those newly entered firms which at first listing fell into size groups 4-8 inclusive.

(2) See footnote (2) on p.106 above.

(3) Robinson, op.cit., p.105.

importance for firms reaching a net asset size somewhere between £400,000 and £10,000,000 in the period 1950 to 1967.(1)

As far as discussion in later chapters is concerned the important fact emerging from our argument in this last section is that firms do not grow with steady progression. In order to survive and sustain growth, firms should possess sufficient power to carry themselves through the 'critical point' or points. Furthermore, possession of such power does not necessarily guarantee further sustained growth on the larger scale of operations consequently obtained. The problem of growth for firms is the problem of how flexibly the management teams are able to adjust their organization to the complexities of administration, production and distribution which accrue with increased size. A good management is one which leads a firm through the critical point(s) and initiates further continuous growth. The importance of good management seems obvious. Firms do not grow through stochastic processes.

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(1) We must, however, hasten to add that in general terms the size of firms reaching the critical point must differ greatly from industry to industry and from period to period because of differences and changes in market sizes, production techniques, etc.

CHAPTER V

PROFITABILITY AND GROWTH

The central issue of this chapter is the examination of the relationship between the profitability and the growth of firms. The knowledge concerning the determinant factors of profit rates and growth rates which was acquired separately in the two preceding chapters is brought together and examined in terms of the systematic influence of each variable on the other.

The chapter consists of three sections. In Section I, a brief survey is made of several theories of investment which provide relevant background knowledge for our present study. In Section II, the association between rates of profit and rates of growth of our 146 continuous firms is examined. The examination is further developed in Section III with particular reference to differences in size, production structure and market control of firms as well as to the different aims which each management appears to pursue.

SECTION I: Previous Studies

The theory of the investment of capital is probably one of the most complex and confused terrains in the whole field of economics. The familiar question, 'What are the causes of variations in investment outlays of firms?', has been asked because knowledge of the investment process is essential if policy makers are to smooth business cycles and stimulate economic growth. Together with the importance of technical progress, the secular growth of capital, i.e., investment in assets, has been considered a prime determinant of the progress of an economy. Yet despite substantial theoretical and empirical studies the essential links in the chain of causes and effects of investment have still to be discovered.

Decisions by firms to invest in capital assets involve a number of economic considerations including expectations about future demand, prices and profitability, anticipations of changes in technology, current

rates of capacity utilization, availability of capital funds, cost competitiveness of the market and anticipated reactions of rival firms. The problem of investment is therefore intrinsically multi-dimensional and it has stimulated economists to attempt different analytical approaches depending on their varying interpretations of underlying business motivations.

Of the many theories and empirical surveys of investment of firms, we discuss below only a selected number of approaches which particularly interest us in the context of our present study.(1) These works may conveniently be classified under four general headings: profit maximization theories, acceleration theories, market structure approaches, and profitability-growth hypotheses.

1. Profit Maximization Theories

Profit maximization or 'marginal' analyses were among the first to be offered as explanations of the investment decision of business firms.(2) In these theories the entrepreneurs are assumed to seek nothing but the maximization of possible profitability from business activity by maximizing the difference between discounted revenues and costs. The volume of investment, therefore, is determined by the anticipated rates of profit on investment and the market rates of interest. Interest rates once played the central role in profit maximization theories and the determination of the influence of changes in interest rates on the volume of investment was one of the important objects of many empirical

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(1) In the present study we are not concerned with the effects of government policies on investment behavior. Tax devices, for example, are certainly frequently employed to stimulate or to alter investment behavior. For a detailed discussion of this subject, see for example, R.E. Hall and D.W. Jorgenson, 'Tax Policy and Investment Behavior', American Economic Review, Vol. 57, (July 1967), pp.391-414, and G.C. Harcourt, 'Investment-Decision Criteria, Investment Incentives and the Choice of Techniques' Economic Journal, Vol. 78, (March 1968), pp.77-95.

(2) The basic principles of profit maximization theories are outlined with relevant references in F. and V. Lutz, The Theory of Investment of the Firm, op.cit., Chapter II, and F. Lutz, 'The Criterion of Maximum Profits in the Theory of Investment', Quarterly Journal of Economics, Vol. 60,(Nov. 1945), pp.56-77.

surveys as well as of model builders. In the field of economic policy the manipulation of interest rates was believed to be a key strategic factor for promoting general economic growth.(1) Most of the empirical findings, however, did not support the importance of interest rates in determining investment of firms.(2) Several reasons were suggested. Capital markets are usually imperfect and the supply of capital funds is limited at the given rate of interest. Alternatively, interest rates may be set too low and, since interest rates cannot be negative, the range of the changes in the rates are too marginal to influence entrepreneurs' decisions on the purchase of additional capital assets.(3)

One major modification of the profit maximization theories resulted from the recognition of the factor of 'uncertainty' and it led the marginalists to re-examine the motives of modern entrepreneurs. They recognized that businessmen are seeking not only larger profits but also protection against uncertainty by placing premiums on the long-term interest rates corresponding to the anticipated risk.(4) The element of uncertainty was further developed into the 'mini-max' solution in the theory of games which implies that businessmen try to maximize their possible profit by estimating future expected gain based on probability calculations.(5)

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(1) In Britain in the 1930's, for example, the maintenance of cheap money, i.e., low interest rates, was the central feature of proposed remedies for general economic recovery. H.D. Henderson, 'The Significance of the Rate of Investment', Oxford Economic Papers, No. 1 (Oct. 1938), pp. 1-13.

(2) The results of various empirical studies concerning the effects of interest rates on investment are summarized by Meyer and Kuh in their book, The Investment Decision, An Empirical Study, op.cit., Appendix to Chapter II.

(3) See, for example, L.R. Klein, The Keynesian Revolution (New York: Macmillan, 1947), Chapter II, and A. Leijonhufvud, 'Keynes and the Keynesians: A Suggested Interpretation', American Economic Review, Papers and Proceedings, Vol.57, (May 1967) pp.401-10. See also, the Committee on the Working of the Monetary System, Final Report, Cmnd. 827, (London: Her Majesty's Stationery Office, Aug. 1959) pp.129-89.

(4) See, for example, F. and V. Lutz, op.cit., Chapter XV.

(5) J. Von Newman and O. Morgenstern, Theory of Games and Economic Behavior (Princeton Univ. Press, 1947).

In short, the original profit maximization theories were modified so that entrepreneurs behave optimally, but the ex post result does not coincide with optimal profit maximization since an element of uncertainty is at work.

Recently a revival of interest in these theories has occurred.(1) Several quantitative works have synthesized the effects of expected rates of profit with those of expected output in order to explain the cyclical path of investment.(2) In other words marginal theories are used with acceleration theories in the explanation of the gradual adjustments of the capital stock to an equilibrium level.

2. Acceleration Theories.

In these theories the investment decision of firms is treated in a very simplified form. That is, changes in the capital stock of firms are determined by the changing rates of output. A lasting increase in demand for the product overtaxes the capacity of current machines and leads typical entrepreneurs to order new assets so as to increase production capacity.(3) Accelation theories are subject to several weaknesses which necessitate many qualifications and re-formulations of the original hypotheses.(4) Technically the theories deal only with net investment. Neither replacement investment nor 'autonomous' investment, i.e., the net investment which does not depend on the immediate short-run behavior of output, is integrated in the hypothesis. Further the theories

(1) See, for example, D.W. Jorgenson, 'Capital Theory and Investment Behavior', American Economic Review, Papers and Proceedings, Vol.53, (May 1963), pp.247-59.

(2) For example, R. Eisner, 'A Distributed Lag Investment Function', Econometrica, Vol. 28 (January 1960), pp.1-29. See also E. Kuh, 'Theory and Institutions in the Study of Investment Behavior', American Economic Review, Papers and Proceedings, Vol. 53, (May 1963), pp.260-68.

(3) See, for example, F. and V. Lutz, op.cit., pp.147-54, J.M. Clark, 'Business Acceleration and the Law of Demand; A Technical Factor in Economic Cycles', Journal of Political Economy, 25, (March 1917), pp.217-35.

(4) Modifications of the theory were made by introducing the age-distribution of machine stocks and describing the pattern of machine installations over time, or by determining the replacement investment in terms of level of output. See Lutz, op.cit. p.154 and Clark, op.cit., and D.J. Smyth, 'Empirical Evidence on the Acceleration Principle', Review of Economic Studies, Vol. 31, (June 1965), pp.185-202.

assume that each firm has no excess capacity. Several revisions were suggested to remedy the deficiencies such as the introduction of a distributed lag pattern into the adjustment processes of capital stock to changes in output.(1) Although it seems oversimplified to assume that investment is a linear function of changes in output, the acceleration principle has been frequently used to explain the trade cycle and the growth of capital stock.(2) J.W. Nevile, for example, conducted an empirical study of the trend of post-war investment in Australia.(3) He found that real private domestic investment was closely related to changes in gross national product (lagged one year) for the period between 1947-8 and 1956-7. His study, however, revealed the fact that there was a large and stable amount of autonomous investment in Australia over the period examined. As we noted, the acceleration theories are, however, not equipped to explain the determinants of this autonomous investment and consequently a large part of investment behavior in Australia in the period is left unaccounted for. Thus the theories offer little explanation of investment behavior which depends on long-run growth prospects.

3. Market Structure Approaches

The importance of monopolistic and oligopolistic firms led several economists to examine the influence of various types of market structure on the investment decisions of firms.(4) One of the chief

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(1) See, for example, R.M. Goodwin, 'Econometrics in Business Cycle Analysis', in A. Hansen, Business Cycles and National Income, (London; Allen & Unwin, 1951), and Smyth, op.cit.

(2) For example, R.F. Harrod, Towards a Dynamic Economics (London: Macmillan, 1948), and J.R. Hicks, A Contribution to the Theory of the Trade Cycle, (Oxford Univ. Press, 1950).

(3) J.W. Nevile, 'Professor Hicks' Theory of Investment and Post-war Investment Figures in Australia and the United States', Economic Record, Vol. 34, (Aug. 1958), pp.249-53. A similar observation is obtained by Smyth for the period between 1947-48 and 1959-60, D.J. Smyth, 'Investment, Growth and the Trade Cycle: The Post-war Australian Experience', Economic Record, Vol. 38, (June 1962) pp.226-45.

(4) Works, both theoretical and empirical, are numerous in this field. See, for example, C. Kaysen, 'A Dynamic Aspect of the Monopoly Problem', Review of Economics and Statistics, Vol. 31, (Feb. 1949), pp.109-13, T. Scitovsky, Welfare and Competition, (London: Unwin Univ. Books, 1951), Bain, Barriers to New Competition, op.cit.

dicta of this approach is that monopolists and oligopolists manipulate (or restrict) output - and hence investment - in order to obtain long-run maximum profit. Thus investment levels are not determined simply by changes in demand as the acceleration theories suggest. When the monopolists or oligopolists face a rising demand, their investment decisions will be subject to a varying set of pull and push factors such as the threat of the potential entry of new firms and the possibility of increasing market shares in order to secure future profit-earning potential. The effect of monopolistic elements on the amount of capital invested in an economy has been extensively debated. General conclusions may be summed up as follows;(1) (i) given the same demand and cost conditions, in monopolistic and oligopolistic markets the rate of capital invested will be less than that in competitive markets, (ii) if, however, a cartel system is introduced there will be more capital per unit of output than under competition, (iii) if the fear of potential competition is strong, monopolists' and oligopolists' investment may exceed the level which competitive firms would achieve, and (iv) a fear of losing market shares and thus future profit-earning potential to aggressive rivals may lead oligopolists to invest heavily in additional capacity when demand is growing.

Another possibility is that monopolists and oligopolists, with generally higher profits and cash flow, are better able to finance investment programmes and therefore will respond to increases in demand with a sharper acceleration of investment. The importance of accessibility of capital funds and the recognition of the imperfect nature of capital market for financing capital outlays have been emphasized by several economists. We may conveniently classify these writers' works under the heading of 'profitability-growth hypotheses'.

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(1) See, for example, Scitovsky, op.cit., J.S. Bain, Industrial Organization, (Berkeley: Univ. of California, 1959).

4. Profitability-growth Hypotheses

In the theories surveyed thus far it is largely assumed, either implicitly or explicitly, that firms can obtain funds with little or no difficulties when the entrepreneurs wish to purchase additional assets. The problem of inadequate finance is not considered.

In various empirical surveys including direct inquiries to entrepreneurs through questionnaires, interview, etc., strong indications have emerged that there are varying inherent disadvantages in using outside debt and that investment outlays are largely determined by the volume of accumulated profit.(1) The heavy reliance on internal finance for growth of modern corporations may be explained in the following terms:

First, imperfections in the capital market are a commonly known fact, and the availability of finance is limited to all firms in varying degrees. For smaller and newer firms it is particularly difficult and expensive to raise funds in the capital market. Also smaller firms do not have easy access to long-term loan and overdraft facilities. As the size of a firm increases, its ability to raise investment funds in substantial amounts is likely to increase.(2) In fact it is true to say that all systems of disciplining rivals by imposing losses require that the rival have inferior access to capital.(3)

Secondly, the principal sources of long-term external finance - loans, preferred and common stock - have the following drawbacks. (a) Loans, whether bank overdrafts or other forms of credit from various financial

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(1) See, for example, J. Lintner and J.K. Butters, 'Effect of Tax on Concentration' in Business Concentration and Price Policy, op.cit., J. Duesenberry, Business Cycles and Economic Growth, op.cit., and Meyer and Kuh, op.cit.

(2) However, beyond some point further increments in size may have a diminishing effect on its command over capital funds. For further detailed study, see B. Tew and R.F. Henderson (eds.), Studies in Company Finance, (Cambridge Univ. Press, 1959), and R.L. Mathews and G.C. Harcourt, 'Company Finance' in R.R. Hirst and R.H. Wallace (eds.) Studies in the Australian Capital Market, (Melbourne: F.W. Cheshire, 1964).

(3) G.J. Stigler, 'Imperfections in the Capital Market', Journal of Political Economy, Vol. 75, (June 1967), pp.287-92.

institutions, virtually always require fixed interest payments regardless of profitability and hence restrict the freedom of management. In addition, dependence on loans invite outside intervention in management decisions on expansion schemes and other financial matters. (b) While dividend payments on stock and bond issues are more flexible than interest payments, they tend normally to be an expensive method of raising money and dilute the earning rates of firms. As already noted this method of finance is particularly costly for smaller firms which have not yet established a good reputation. Further, dividend payments are not deductible as an expense for tax purposes, while the issue of common stock frequently results in control of management by shareholders.

Thirdly, the increased tendency towards divorce of ownership and control in modern corporations implies that a professional management tends to be cautious about debt finance. With external finance any substantial deficits in a firm often leads to the loss of jobs for its managerial groups, while successful performance contributes little to the managers' personal income gain since they are usually only minor stockholders. Thus it is to be expected that management regards finance by retained profit as essentially risk-free and preferable.

A similar argument has recently been further advanced by J.K. Galbraith who is particularly concerned with the importance of the element of planning in modern corporations. He states that,

> 'Control of the supply of savings is strategic for industrial planning. Capital use is large. No form of market uncertainty is so serious as that in valuing the terms and conditions on which capital is obtained. Apart from the normal disadvantages of an uncertain price, there is danger that under some circumstances no supply will be forthcoming at an acceptable price. This will be at the precise moment when misfortune or miscalculation has made the need most urgent. And unlike supplies of raw material or even labor, the supplier of funds is traditionally conceded some degree of power. Money carries with it the special right to know, and even to suggest, how it is used. This dilutes the authority of the planning unit.
>
> All of these dangers and difficulties are avoided if the firm has a secure source of capital from its own earnings. It no longer faces the risks of the market. It concedes no authority to outsiders. It has full control over its own rate of expansion, over the nature of that expansion and over decisions between products, plants and processes.'(1)

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(1) Galbraith, The New Industrial State, op.cit., p.39.

Fourth, alternatively the strong preference for internal funds shown by most corporations may simply reflect their desire to make certain not to miss any favourable investment opportunities by keeping sufficient cash at hand.(1)

One of the earliest attempts to introduce the importance of retained profit as a determinant factor of firms' investment behavior was made by J. Steindl in the early 1950's. In the introduction to his book, Maturity and Stagnation in American Capitalism, Steindl suggested that, ' . . . entrepreneurs invest because they have saved in the past.'(2) He assumed that the increase in retained capital (in Steindl's terms it is 'entrepreneural capital' or 'internal accumulation') is an important inducement for the entrepreneur to invest. If there are firms which, owing to the adoption of any cost-reducing techniques, have greater gross profit margins than others, they have a natural tendency to expand relatively to other firms. Because firms with greater profit margins will accumulate greater internal funds this, in turn, enables and encourages them to invest to a greater extent so as to further increase accumulation of internal funds.(3)

A similar idea was later developed into a more refined theory of growth of firms by J. Downie.(4) He illustrated how the differences in production costs (efficiency) of firms - and hence profitability - create significant differences in the growth rates of firms (size of firms measured by sales value). Efficient firms can grow faster than the remaining firms in an industry and the differences in the rates of growth between efficient and less efficient firms accelerate over time through the

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(1) K. Borch suggests the introduction of some forms of the corporate 'liquidity preference' and 'propensity to save' may help explain this corporate preference for internal funds. K. Borch and others, 'Topics in economic theory: discussion; American Economic Review, Papers and Proceedings, Vol.53 (May 1963) pp.269-74.

(2) J. Steindl, Maturity and Stagnation in American Capitalism, (Oxford: Basil Blackwell, 1952), p. vii.

(3) Ibid., pp.40-55.

(4) Downie, The Competitive Process, op.cit.

process which Downie called the 'transfer mechanism'. The effect of this transfer mechanism is explosive and it can only be stopped by the introduction of new cost-saving techniques by less efficient firms.

In both Steindl and Downie's theories each firm is assumed to be a Schumpeterian innovator. In brief it seems to be assumed by both writers that for a firm to grow, it must have both the desire and the means. If all firms are consumed with an equal desire for growth without limits, then the most profitable firms grow fastest. It is, however, true to say that growth creates profit as well, i.e., firms which diversify continuously into new prosperous markets and cultivate all profitable opportunities grow fast and obtain high profit rates regardless of the saturation of demand in their part of the established market. Profits are necessary for growth, and growth in turn produces profits.

In a theoretical framework R. Marris has formulated a systematic association between the rate of return and that of growth of individual firms.(1) If we interpret him correctly he suggests that there is a 'necessary' level of profit for each firm which varies not only with risk but also with the rate of growth which each firm attempts to achieve. He depicts, therefore, a 'demand-growth' curve of a firm which indicates the set of combinations of the maximum growth rates of required capacity (capacity needed to meet all orders at a given rate of utilization) consistent with varying values of the rates of return.(2) Any management chooses the maximum sustainable growth rate on such a 'demand-growth' curve based on its particular preferred combination of growth and profit. Basically this model is a growth maximization theory with minimum (secured) profit constraint. As the title 'Managerial' Capitalism suggests, Marris takes great account of the flexibility of management decisions. The motivation of professional management is largely based on growth and expansion of the firm, but the fear of being taken-over discourages

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(1) See Marris, The Economic Theory of 'Managerial' Capitalism, op.cit., and Incomes Policy and the Rate of Profit in Industry, op.cit.

(2) See Marris, The Economic Theory of 'Managerial' Capitalism, op.cit. Chapter 6.

management from pursuing growth at the undue expense of profitability. A firm must distribute to shareholders sufficient of its income to keep the market value of shares high enough to avoid any take-over raids. In other words, a firm must secure a certain rate of return in order not only to sustain further growth, but also to maintain the valuation ratio (the value of its shares relative to their asset backing).

In support of his theoretical hypothesis, Marris estimated regression coefficients of rates of return on rates of growth of all British public quoted companies in selected manufacturing industries in the period 1950-60.(1) In fact, several statistical investigations have also been made by other economists to examine the relationship between the profitability and the growth of firms.(2) In spite of the differences in their definitions of profit rates, capital and growth of capital, and differences in statistical sources, the majority of these investigations identify a positive relationship (some linear and some non-linear relationships) between the two variables. However, the researchers differ in their interpretations of each observed relationship.

J.E.S. Parker, who finds a non-linear relationship between growth (of net book value of tangible assets) and rates of profit in 87 selected British public manufacturing firms in the period 1954-60, suggests that finance will be more readily forthcoming if firms seeking it are able to show high rates of profit. As a firm becomes successful (profitable) it gains a favourable reputation and money is more readily available for expansion. The forces leading to expansion are cumulative, i.e., success breeds success. Similarly, one would expect the effect to be cumulative in a downward direction.(3) A non-linear relationship of a different

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(1) Marris, Incomes Policy and the Rate of Profit in Industry, op.cit., Empirical Appendix.

(2) For example, T. Barna, Investment and Growth Policies in British Industrial Firms, op.cit., Parker, 'Profitability and Growth of British Industrial Firms', op.cit., and Singh and Whittington, op.cit., Chapter 7.

(3) Parker, op.cit.

pattern is found by Singh and Whittington in their selected 364 British manufacturing firms in the longer period of 1948 to 1960. They suggested that there should be a different relationship between profitability and growth for firms in the different ranges of profitability. For instance, high profitability is normally expected to lead to fast growth, but a firm with exceptionally high profit may not find external finance easy because the stock market may not expect such exceptional profitability to continue for long.(1)

Alternatively, T. Barna interprets his observed association between profitability and growth as a non-causal one. Rather both growth and profitability are reflections of the character of the firm, i.e., a good (successful) management is capable of maintaining high profitability while pursuing fast growth.(2)

Our survey of the theories of investment has so far been concerned only with the internal growth of firms. No doubt it is important to consider growth through acquisitions. By acquisition arranged through exchange of shares, firms may frequently obtain collections of production resources with little new outlay and finance. It is often said that growth through acquisitions is the fastest and most economical method. However, it is important to note that growth through external means must also be subject to dynamic limits. As Penrose argues, both the digestive capacity of the absorbers and the number of suitable firms available for acquisition at any given time are limited.(3) These problems of external growth will be discussed in the following sections in their relevant contexts.

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(1) Singh and Whittington, op.cit., pp.176-7.

(2) Barna, op.cit., pp.19-20.

(3) Penrose, The Theory of the Growth of the Firm, op.cit., pp.127-31.

SECTION II: Profitability and Growth of the Firms

In the preceding two chapters we found that there were considerable differences between individual firms in both the rates of return and the rates of growth. We also found that firms which displayed high profit and fast growth rates in one period tend to behave similarly in the next, and similarly a poor performance of firms with low profit and slow growth rates in one period tends to continue in the following period. The tendency, however, appears to be less in the case of growth rates. We suggested that the differences in profitability and growth performances reflect the differences in management of firms. By differences in management, we have referred so far simply to the differences between good (successful) and bad (unsuccessful) management.

In this chapter we pursue further the examination of differences in business policies chosen by management of different types and with varying skills and motivations. The performance of each firm must reflect differences in such internal factors. Our criteria of business performances was based only on profitability in Chapter III, and growth in Chapter IV. But the profitability-growth hypothesis which has been put forward by Marris and others suggests that there is a close association between the two. In the following we will, in turn, interpret the performance of firms by the combination of their profit and growth rates. We are assuming that motivations of firms are manifold, ranging from simple profit maximization to sales and growth maximization of various types and forms. The validity of this assumption will be examined; that is, we will ask what sort of motivations determine the business behavior and performance of individual firms of various sizes and operating in varying types of market structures.

To begin with let us examine the relationship between the two variables, rates of profit and rates of growth of firms, by means of regression and correlation analysis. Regression coefficients of annual average growth rates on rates of profit have been calculated for our 146 continuous firms for the 18 years from 1950 to 1967. Values of rates of profit and rates of growth are obtained from Chapters III and IV respectively.

Briefly, the results of the regression analysis in Table 5.1 indicate that:- If the regression coefficient, b, is positive ($b > 0$) the growth rate increases as profitability increases, and if b is larger than unity ($b > 1$) an increase in firms' profit rates is associated with a larger increase in growth rates. For example, if $b = 1.5$ this indicates that one per cent increase in profit rate is associated with a 1.5 per cent increase in the growth rate. If b is positive but less than unity ($1 > b > 0$), this indicates that an increase in the profit rate of firms is associated with a smaller increase in growth rates. Negative values of b ($b < 0$) indicate that an increase in profit rate is associated with a decrease in the growth rate. The regression correlation coefficient r^2 shows the actual degree of explanation, i.e., if $r^2 = 0.50$ this indicates that 50 per cent of the changes in growth rate of firms is explained by the changes in profit rate.

The result of the regression analysis of annual average growth rates on rates of profit for our 146 continuous firms for 1950-67 is very weak; a regression coefficient r^2 is estimated at 0.02 (statistically not significant) indicating that there is almost no relation between rates of profit and rates of growth (see Table 5.1 below, last row).

The same relationship is shown diagrammatically in the scatter diagram below (Diagram 5.1) in which observed combinations of profit and growth rates of each of the 146 firms are plotted. A glance at Diagram 5.1 shows that the weak relationship between the two variables is largely caused by several extreme observations with high rates of growth. We find a fairly strong relationship between profitability and growth among these firms whose annual growth rates do not exceed 20 per cent - i.e., among those firms termed 'middle' and 'slowest growing' in Chapter IV. The regression coefficient r^2 for these 127 'middle' and 'slowest-growing' firms is 0.24 (the regression relation is statistically significant at the 5 per cent level) which is much higher than that for the total population. No strong relation seems to exist among the 19 fastest-growing firms. The diagram roughly indicates a parabolic relationship between the two rates when the middle and slowest growing firms are combined. In other words it suggests that higher profitability tends to be associated with faster growth

up to a certain growth rate (20 per cent per annum), but beyond this level the relationship appears to be somewhat reversed and faster growth is associated with declining profitability.

The question now arises, which variable causes which? The observed statistical correlation can only indicate the association between the two variables and it does not tell us anything about causal relationships between the two. On a priori grounds the relationship may be either way: growth causing profits, or vice-versa.(1)

Let us first look at the 19 fastest-growing firms. In Chapter IV we found that these firms grew continuously over a number of years, and we argued that their extremely high rate of growth per annum did not result from a single once-for-all growth scheme, but from several continuously launched expansion projects spreading over the 18 years studied.(2) On these grounds may we call these firms 'growth oriented' firms?

Referring back to Marris' argument about firms which are extremely growth conscious he claims that they may yield not only faster growth but also greater profitability through heavier advertizing, research and development which leads to successful diversification into new markets. But on the other hand Marris points out that too fast growth may eventually prove increasingly expensive and affect profits adversely. Thus the relation between the two variables must inevitably reverse. As has been noted before, when the earning power of a firm becomes too depressed it may expose itself to take-over raids. Hence a management cannot therefore

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(1) In order to specify the expected 'feedback' relationship between profitability and growth of firms, we tested several correlations between the two variables using a six year time lag. The introduction of the six year time lag is based on our observation that most firms may be expected to plan, undertake, and obtain returns from their investment schemes within six years. The results are not improved compared with those in Table 5.1 below. They are shown in Appendix Table F.4. Information about the investment schemes of firms is obtained from Department of Trade and Industry, Developments in Australian Manufacturing Industry, op.cit., 1956-57 to 1966-68.

(2) See PP.104-5 above.

Table 5.1

Results of Regressions of Net Assets Growth on Profitability

Regression correlation coefficient : r^2
Regression equation : $g = a + bp + \epsilon$
where a and b are constant terms
ϵ the random error term
g, the growth of net assets (%)
p, net profit rate per net assets (%)

	No. of Companies	Regression of g on p for 1950-55				Regression of g on p for 1956-61				Regression of g on p for 1962-67				Regression of g on p for 1950-67			
		r^2	a	b	ϵ	r^2	a	b	ϵ	r^2	a	b	ϵ	r^2	a	b	ϵ
(1) 127 'Middle' and 'Slow-growing' firms																	
1 small firms	24	.003	17.19	.10	.36	.37	-.45	1.31*	.36	.72	-2.55	.80*	.11	.43	3.39	.76*	.19
2 medium-size firms	75	.001	18.03	.13	.51	.16	2.87	1.11*	.29	.41	-2.12	1.04*	.15	.20	4.64	.78*	.18
3 large firms	28	.000	14.43	.01	.55	.17	.13	1.44*	.62	.14	1.62	.70+	.34	.17	6.10	.56*	.24
Total 127 firms	127	.002	16.88	.12	.26	.19	1.81	1.20*	.22	.40	-1.70	.95*	.10	.24	4.79	.72*	.11
(2) Single-trade firms																	
1 'Middle' and 'slow-growing' firms	78	.001	16.82	.10	.33	.39	-3.08	1.57*	.23	.55	-2.55	.97*	.10	.34	2.84	.85*	.14
2 All firms	87	.000	19.30	-.01	.32	.24	-2.34	1.77*	.34	.32	-1.93	1.11*	.17	.21	3.80	.94*	.20
(3) Diversified firms																	
1 'Middle' and 'slow-growing' firms	49	.005	16.59	.20	.43	.12	6.14	1.01*	.39	.15	.44	.81*	.28	.11	8.00	.47*	.19
2 All firms	59	.08	14.06	.71*	.32	.09	8.62	1.11*	.48	.09	2.86	.64*	.26	.00	16.42	-.13	.42

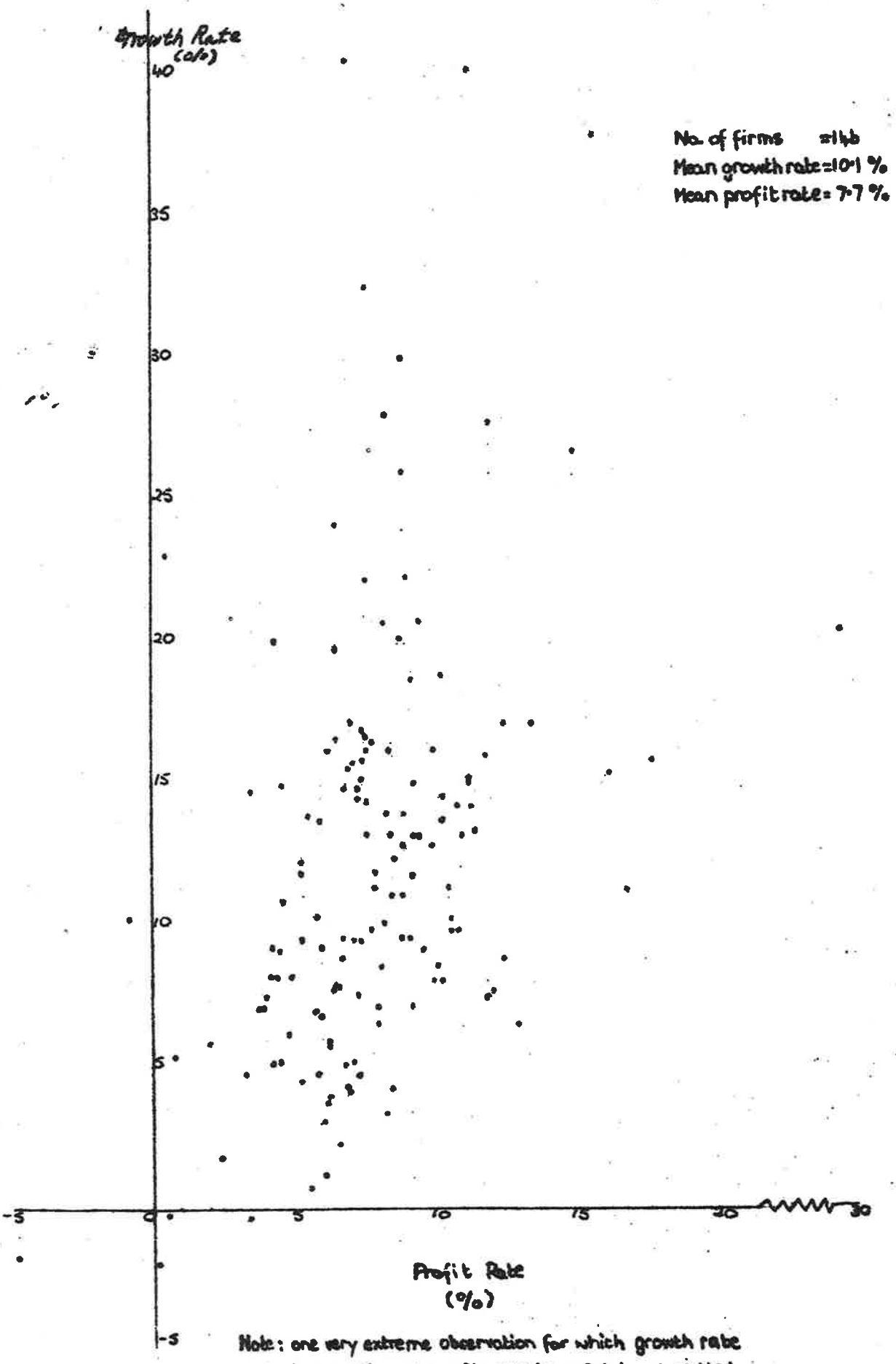
	No. of Companies	Regression of g on p for 1950-55				Regression of g on p for 1956-61				Regression of g on p for 1962-67				Regression of g on p for 1950-67			
		r^2	a	b	ϵ	r^2	a	b	ϵ	r^2	a	b	ϵ	r^2	a	b	ϵ
(4) Major industry groups - 146 continuous firms																	
1 Cement, etc.	10	.13	40.23	-1.76*	1.62	.04	4.09	1.55	2.69	.13	-3.10	1.74	1.59	.21	-2.35	2.18	1.50
2 Chemicals, etc.	14	.0001	25.48	.02	.61	.23	-2.99	2.13+	1.13	.13	-4.10	2.29+	1.68	.14	8.43	.93	.65
3 Iron and Steel, etc.	19	.0002	28.19	-.02	.42	.08	13.47	.48	.41	.02	8.20	.42	.65	.02	15.06	.12	.21
4 Electrical Engineering	12	.0001	20.47	-.04	1.38	.23	-10.56	4.30	2.52	.13	2.52	.44	.36	.08	9.64	.89	.99
5 Textiles, etc.	44	.001	16.16	.08	.53	.28	-.21	1.11*	.27	.45	-2.55	.98*	.17	.40	1.82	.85*	.16
6 Sawmills, etc.	12	.05	25.10	-.39	.52	.21	-6.40	2.33	1.43	.26	-.79	.67+	.36	.04	9.68	.24	.37
7 Food, tobacco, etc.	24	.09	4.45	1.35	.93	.55	-9.09	2.77*	.53	.34	-7.05	1.57*	.46	.18	.38	1.54*	.71
8 Newspapers	11	.37	3.59	.79*	.34	.02	25.63	-.72	1.67	.02	9.19	-.28	.62	.55	60.97	-5.00*	1.52
(5) Concentration groups - 146 continuous firms																	
1 Monopoly and duopoly	12	.000	10.99	-.01	.26	.26	-3.66	2.49+	1.34	.19	-1.78	.93	.61	.18	8.45	.37	.25
2 High-oligopoly	27	.04	18.08	.34	.33	.33	-.10	1.49*	.42	.21	3.39	.99*	.38	.24	7.81	.81*	.29
3 Moderate-oligopoly	29	.003	18.72	-.15	.51	.04	6.76	1.16	1.04	.10	.84	.90+	.51	.23	39.00	-2.92*	1.01
4 Low-oligopoly	23	.002	23.95	-.17	.77	.19	4.10	2.32*	1.05	.09	2.24	.60	.40	.10	10.08	.73	.49
5 Unconcentrated	34	.10	10.68	1.36+	.71	.05	5.69	.63	.48	.46	-3.30	1.18*	.22	.17	3.31	1.05*	.41
6 Competitive	5	.46	72.99	-3.83	2.40	.56	-4.10	1.75	.89	.31	-1.23	1.66	1.43	.01	11.79	.15	1.05
7 High-competitive	16	.001	15.25	.07	.56	.29	-1.24	1.11*	.46	.72	-2.97	.76*	.13	.47	2.12	.72*	.21
(6)																	
Total 146 firms	146	.01	16.83	.32	.23	.14	2.99	1.40*	.29	.25	- .58	1.01*	.14	.02	9.69	.41+	.23

* Significantly different from zero at less than the 5% level.
\+ Significantly different from zero at the 10% level.

Relationship between Annual Average Profit Rate and Growth Rate: 1950-1967.

Diagram 5.1

1146 Continuous Firms.



Note: one very extreme observation for which growth rate is 100·5% and profit rate is -0·9% is not plotted.

Diagram 5.2

Small Firms (Net Assets less than £200,000 in 1950)

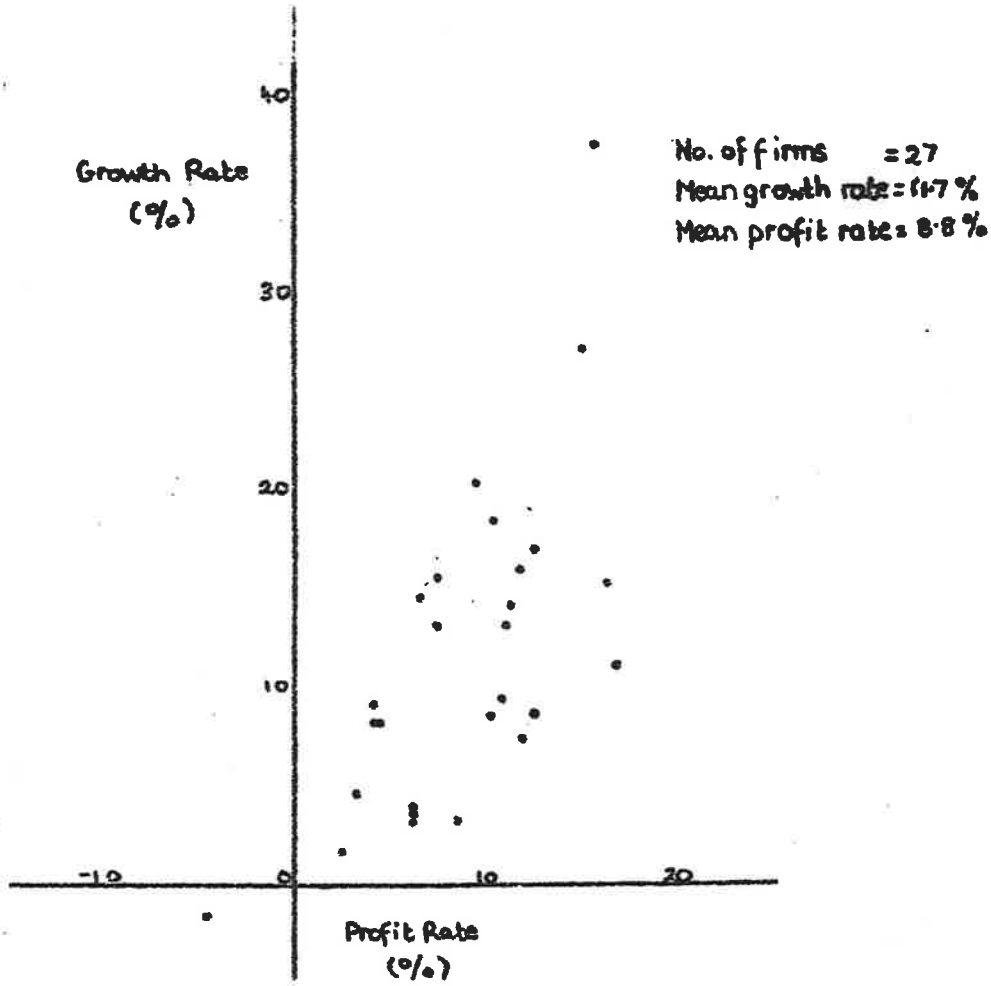
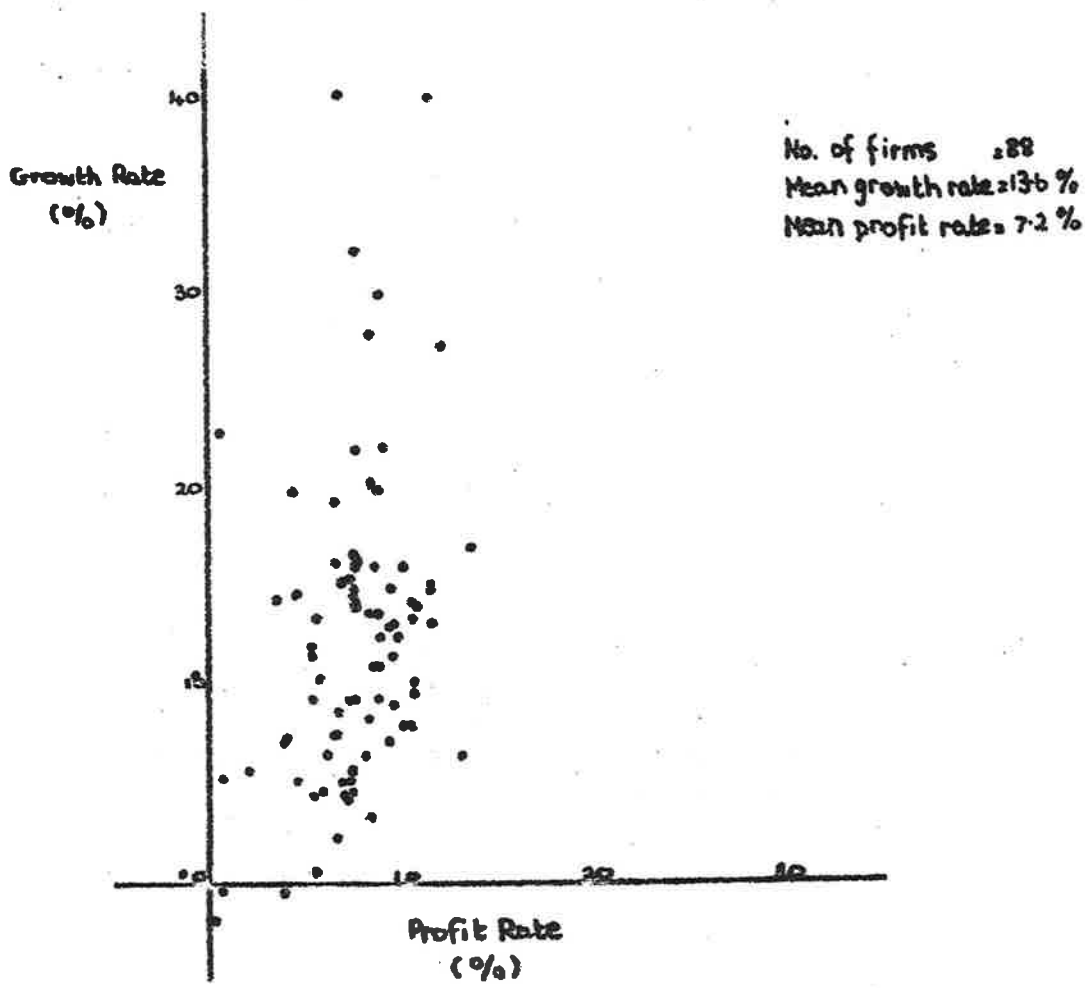


Diagram 5.3

Medium-size Firms (Net Assets between £200,000 and £1,600,000 in 1950)



Note: one very extreme observation for which growth rate is 100·5% and profit rate is -0·9% is not plotted.

Diagram 5.4

Large Firms (Net Assets greater than £1,600,000 in 1950)

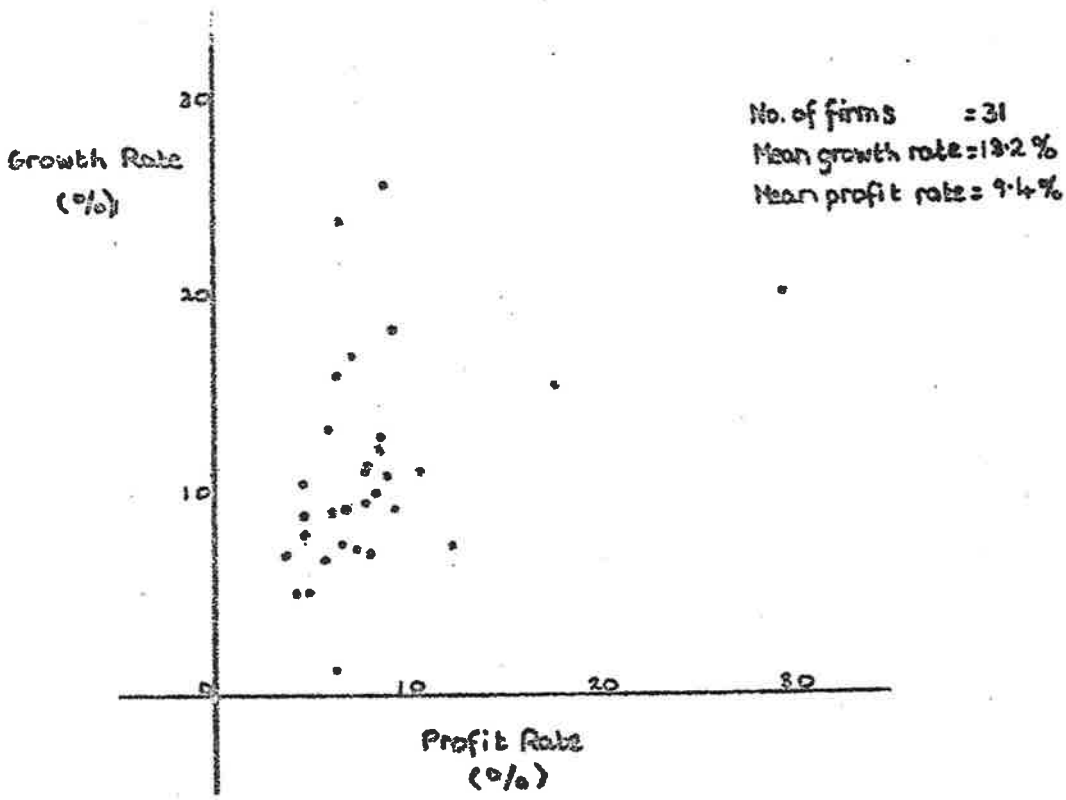


Diagram 5.5

Cement, etc.

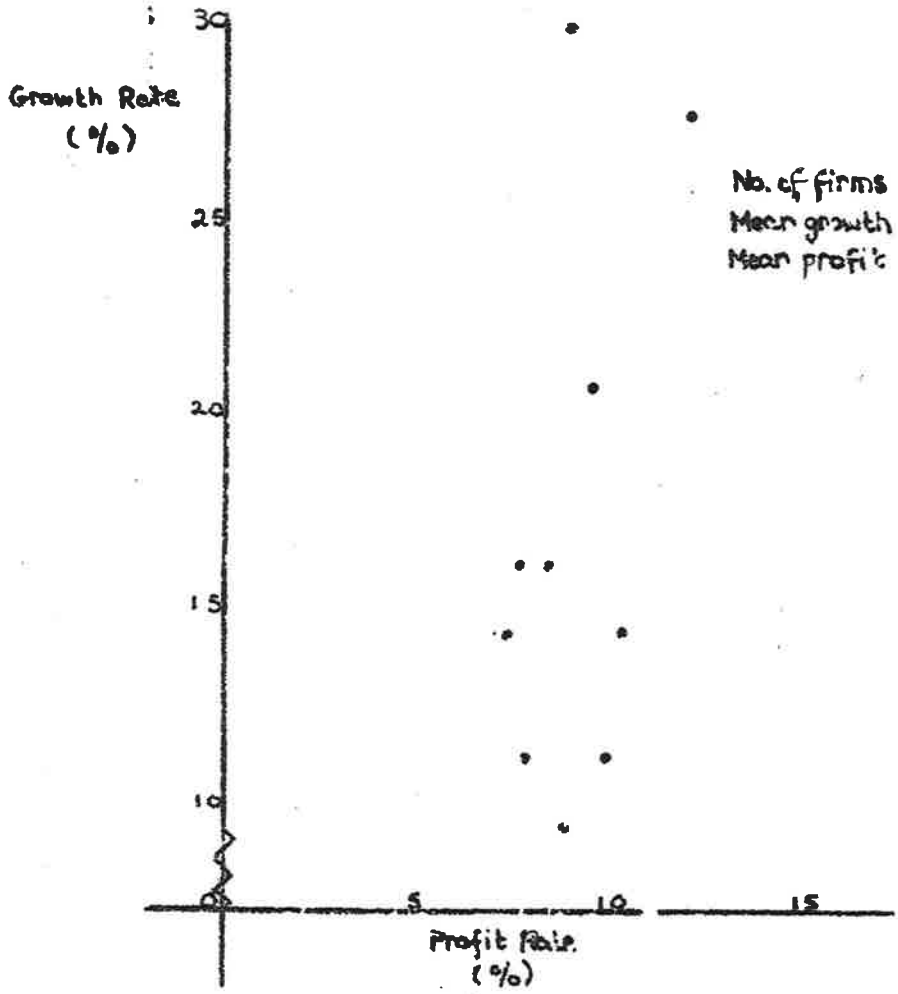


Diagram 5.6

Chemicals

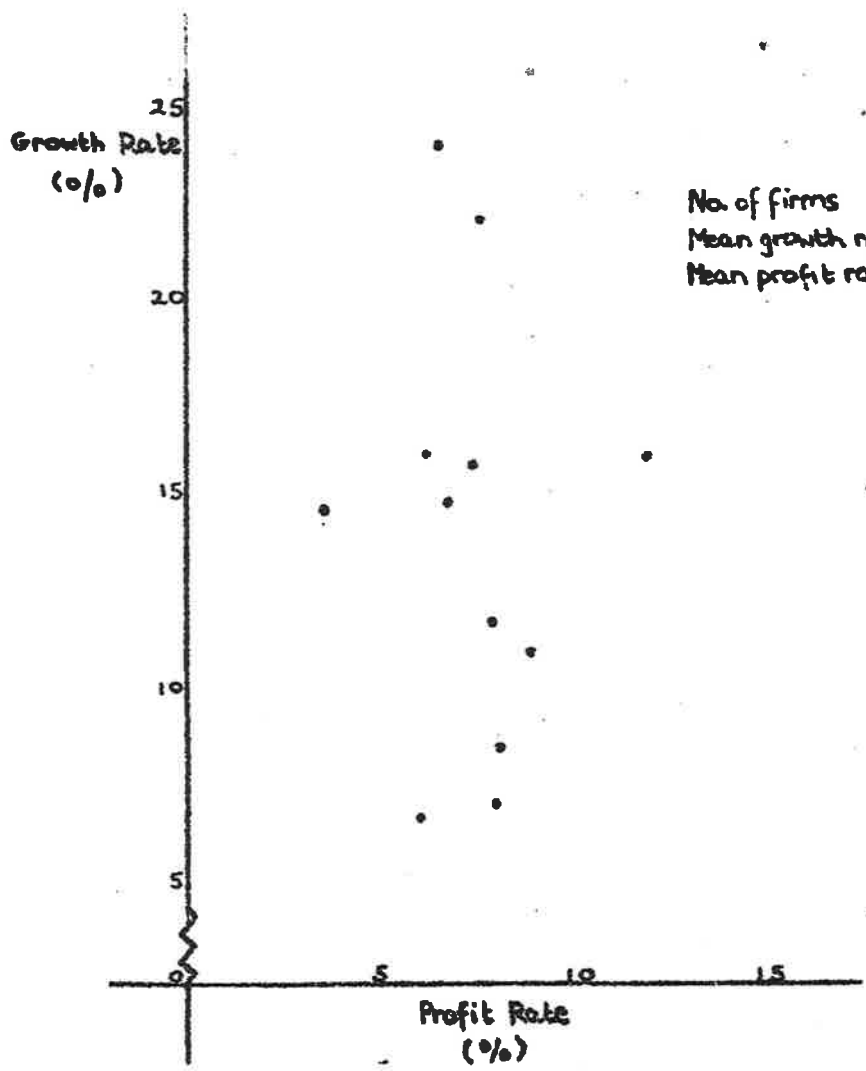


Diagram 5.7

Iron and Steel, etc.

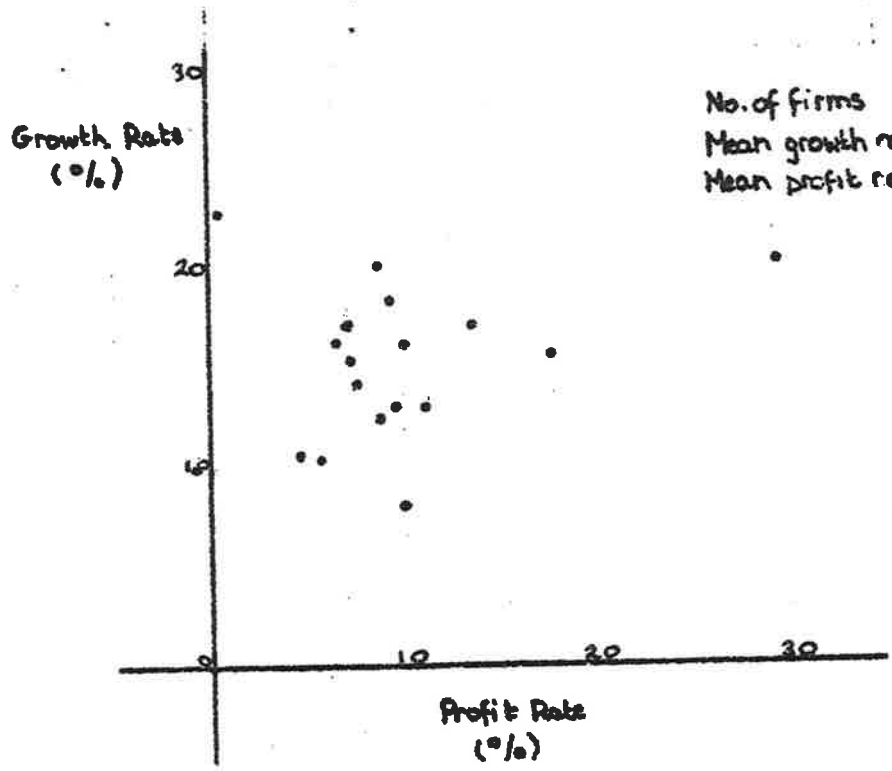


Diagram 5.8

Electrical Engineering.

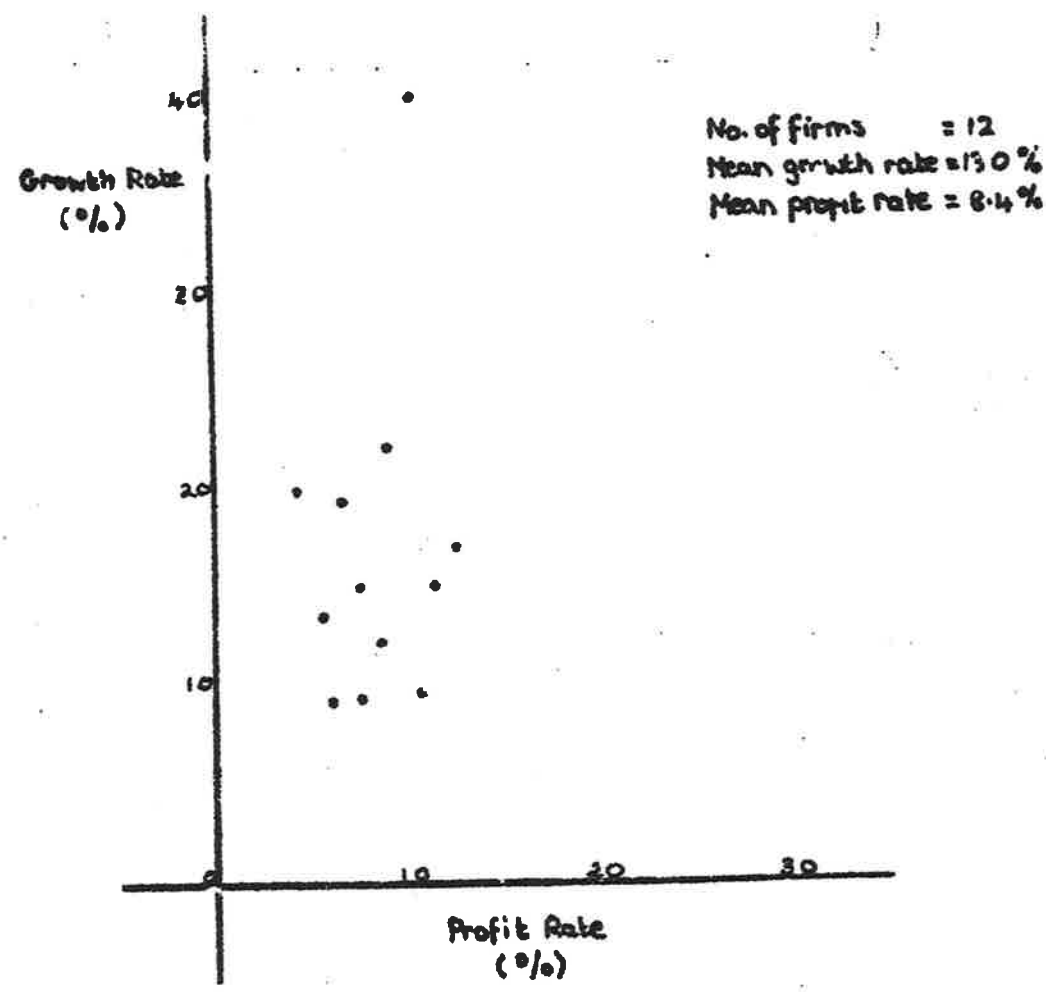


Diagram 5.9

Textiles, Clothing and Footwear.

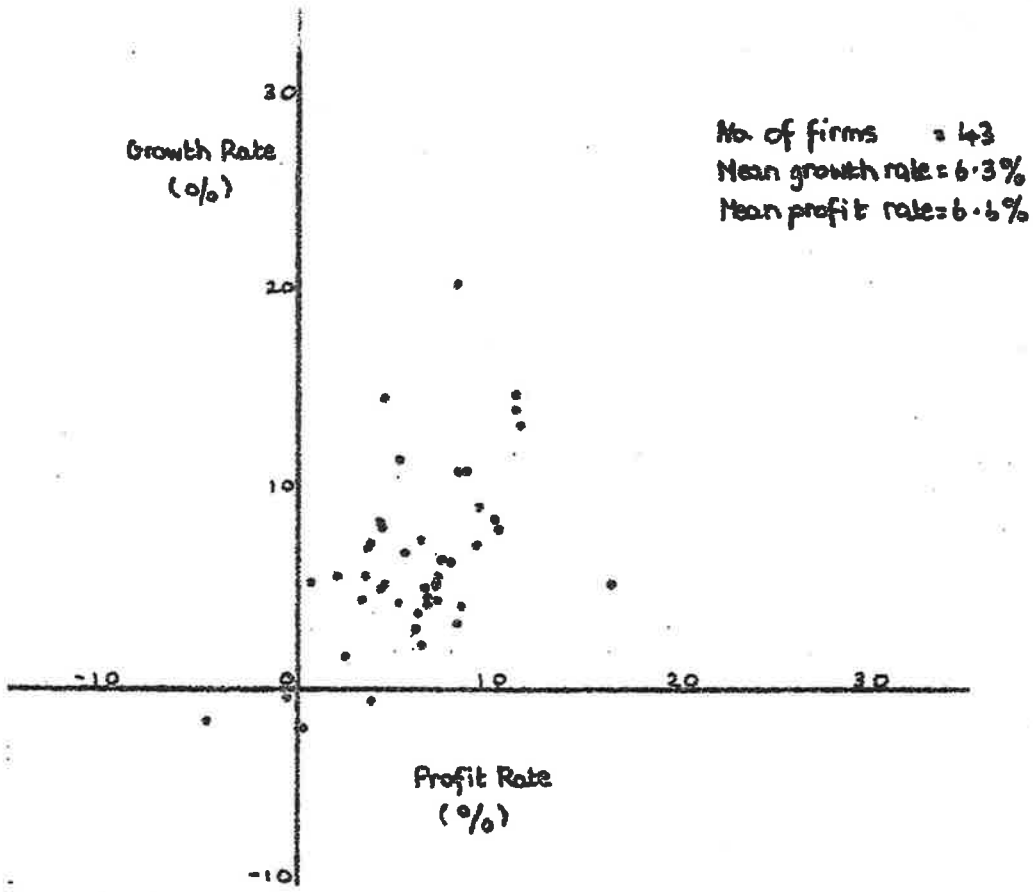


Diagram 5.10

Sawmills, etc.

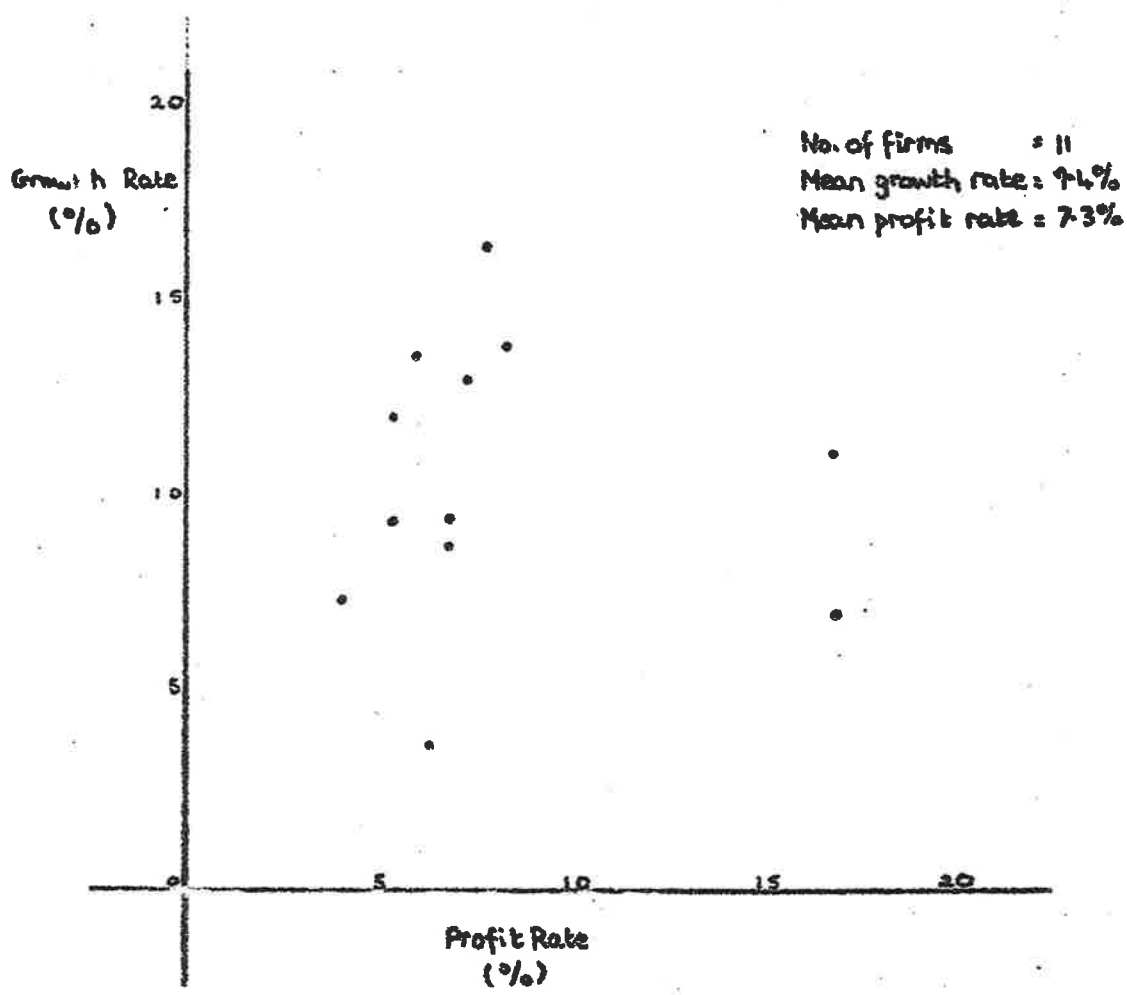
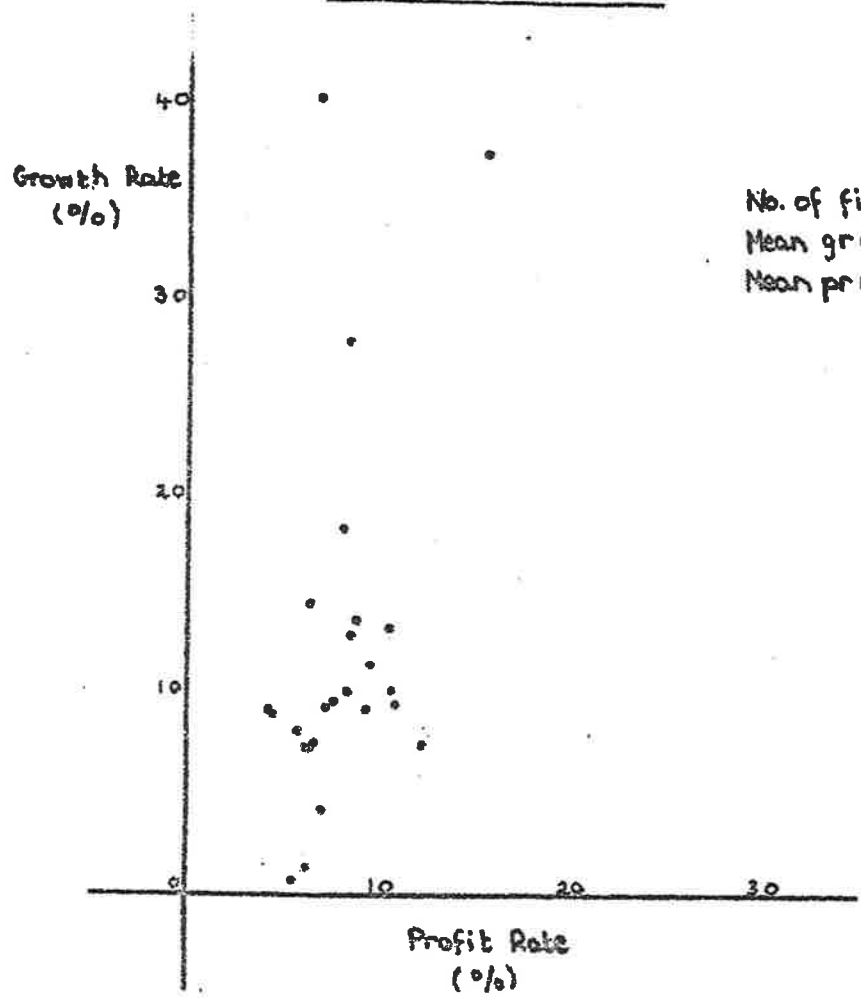


Diagram 5.11

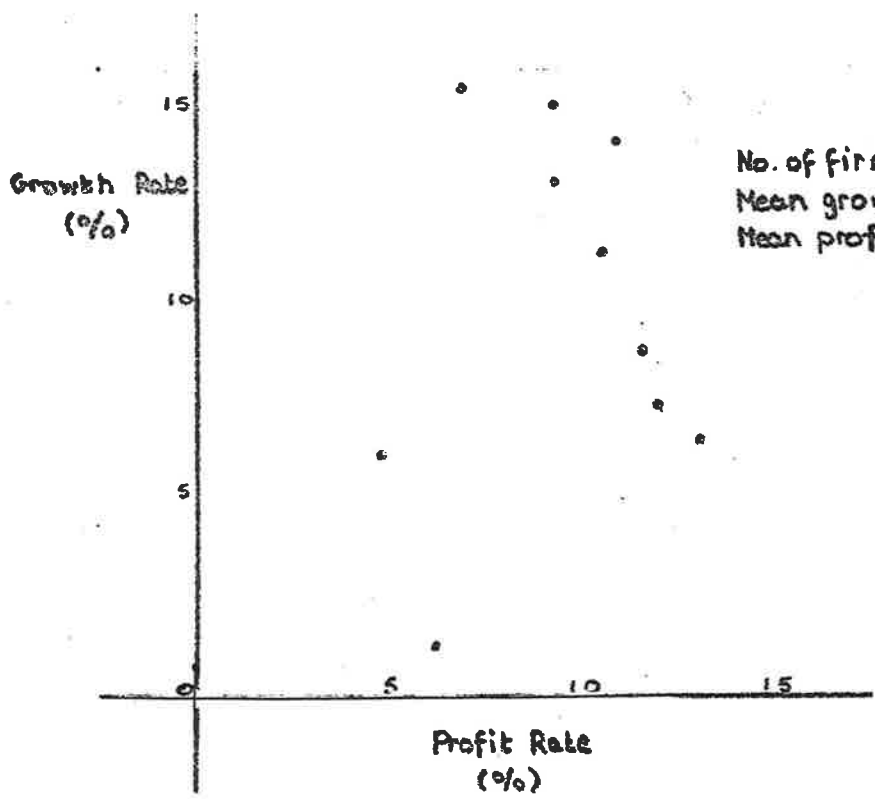
Food, Tobacco and Breweries.



No. of firms = 24
Mean growth rate = 9·7%
Mean profit rate = 8·2%

Diagram 5.12

Newspapers.



No. of firms = 11
Mean growth rate = 9·6%
Mean profit rate = 9·6%

Note: one very extreme observation for which growth rate is 100·3% and profit rate is -0·9% is not plotted.

force its firm to grow too fast.(1) Most modern corporations may be growing at faster rates than those which the owners would generally choose, but not so fast as to make the shareholders sufficiently dissatisfied to sell shares to take-over bidders.(2)

If Marris' argument is accepted, how do we interpret the performance of our 19 fastest-growing firms? Were they growing too fast at the expense of profitability? Were they exposing themselves to possible take-over raids? Certainly the rates of profit of several of these firms appear to be depressed. The rates of profit of four firms, for example, are well below the average of 7.7 per cent for all 146 continuous firms.(3)

Concerning the danger of take-over raids, in the case of 11 of these 19 firms, large parcels of voting shares were held by other companies; either domestic or overseas companies. According to information in 1965-67, in seven firms the shareholdings of other companies exceeded 50 per cent of the total, and in the remaining four, other firms held from 10 to 50 per cent. Following Wheelwright those 11 firms may be called 'company controlled' firms.(4) In addition, five out of the remaining eight firms are examples of Wheelwright's 'majority and minority controlled' firms in which more than 10 per cent of total voting shares are owned by a limited number of shareholders.(5) This eventually leaves only three 'management controlled' firms to which Marris's argument may be applicable. Because of this compact ownership of shares, the suggested fear of take-over raids

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(1) Marris, The Economic Theory of 'Managerial' Capitalism, op.cit., pp.175-84, and pp.259-60.

(2) Marris states that top management has three main motives; (i) growth, because growth provides job satisfaction, job expansion, higher salaries, higher bonuses and prestige; (ii) continuity of employment, which means for the management team as a whole, avoidance of involuntary take-over; and (iii) reaonsable treatment of shareholders and generally good relations with the financial world. This set of motives will be applied by management to the determination of growth and profit rates of the firm. R.L. Marris, 'Profitability and Growth in the Individual Firm', Business Ratios, Vol. 1, (1967) pp.3-12.

(3) These four firms are Ampol Petroleum, Borg-Warner, News, and Simpson-Pope.

(4) Wheelwright and Miskelly, Anatomy of Australian Manufacturing Industry, op.cit.

(5) Ibid.

in the 16 'company controlled' and 'majority and minority controlled' firms may have been minimal, or even non-existent in some cases. It is therefore possible that those 19 firms were primarily growth oriented. For instance some overseas controlled firms, such as Borg-Warner, continuously invested in large scale expansion schemes regardless of the firm's current earning power, obtaining financial support for expansion from the parent company. In quite a number of firms, as we will see later in this chapter, the fast growth in the period was contributed to by diversification into new markets and acquisition of other firms was often employed to pursue this end.(1) Such deliberate growth policies appear to have depressed the earning power in those 19 fastest-growing firms to varying degrees. These firms demonstrate the extreme case of growth maximization behavior under which profitability and growth have a reverse relationship, i.e., faster growth is associated with declining profitability.

The observed profitability and growth relationship appears to have given rise to two main types of confusion among economists. The first is seen in the argument which suggests that there is no practical difference between growth and profit maximization as criteria for the selection of investment programmes because growth is the best long-run strategy for maximizing profits.(2) The other confusion stems from the fact that beyond a certain growth level, profitability begins to decline because high outlays are required to promote sales and growth, while on the other hand further growth is prevented by too depressed profitability. Thus it is argued by Baumol, for example, that growth maximizing firms will grow as

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(1) There are at least seven out of the 19 firms which may be quoted as examples of growth through diversification in 1950-67; they are Allied Mills, Blue Metal Industries, Boral, G.M.H., News, Petersville Australia and Simpson-Pope Holding. See also p.101 above, Jobson's Investment Digest, op.cit., and Department of Trade and Industry, Developments in Australian Manufacturing Industry, op.cit., 1956-57 to 1966-68.

(2) '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 for the use of their capital or their "risk bearing", then, from the point of view of investment policy, growth and profits become equivalent as the criteria for the selection of investment programmes'. Penrose, op.cit., p.30. See also, S. Peterson, 'Corporate Control and Capitalism', Quarterly Journal of Economics, Vol.74, (Feb. 1965), pp.1-24.

fast as is possible within the constraint of securing a certain minimum profit rate.(1)

With regard to the first point there can be little doubt that in fact decisions on investment, output, price and cost made by growth maximizing firms must differ from those of profit maximizers within any reasonable time horizon. The best proof of this is provided by our 19 'fastest growing' firms accepting relatively depressed profitability over the whole 18 year period in pursuit of growth. Their fast growth policy may eventually bring high profit rates but to then conclude that their management strategy is hence identical to that of firms whose aim is to maximize profits would be fatally to warp any meaningful definition of the time horizon that firms actually have in view when making decisions on investment, output, etc.

As for the second argument, the confusion arises from the misuse of the term 'growth maximization' which should only be used to refer to a firm which is never prepared to forego an increase in net revenue.(2) A firm will not invest in expansion for the mere sake of growth itself if the return on the investment is negative because that would eventually decrease the funds available for further investment for expansion. But insofar as new investment yields a positive return, total profit (thus funds available for further expansion) will increase with every increment of investment. Hence a growth-maximizing firm continues to grow as fast as it can exploit such opportunities for expansion. In our 19 'fastest-growing' firms we may identify examples of such 'growth-maximizing' firms.

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(1) Baumol argues that '. . . the rate of growth of the firms' operation varies (directly) with investment, and (after a point) inversely with the profit rate . . .' and 'the optimal profit stream will be that intermediate stream which is consistent with the largest flow of output (or rate of growth of output) over the firm's lifetime. . . .we can then determine the optimal profit rate which from our long-run point of view enters into constraints just as one of the variables in the system'. Baumol, op.cit. p.1086.

(2) A similar definition is employed by Penrose, op.cit., p.30 and J. Williamson, 'Profit, Growth and Sales Maximization', Economica, New Series, Vol.33, (Feb. 1966) pp.1-16.

For the remaining 127 'middle' and 'slow-growing' firms, the motivations of management are not so obvious. What does the observed association between profitability and growth indicate in this group of firms? Again we must ask, does growth cause profitability or vice-versa?

In fact the answer is both, or rather on a priori grounds we suggest that the relationship between growth and profitability is that of 'feedback' associations under which each variable affects the other. Suppose we assume that most firms want to grow fast and maintain high profitability at the same time: then the end result of how fast a firm grows and what rate of profit it makes depends, of course, on the skill and motivation of the management, as well as on the size of firm and the attendant economic environment such as demand conditions, market structure, etc. With equal rates of profit, a firm in a market with buoyant demand may be expected to grow faster than one in a less prosperous market. Similarly, in a market where competition among firms to increase relative market shares is keen, a firm is forced to accelerate its rate of growth as compared with a firm in a less competitive environment. As for the rate of return, market opportunities are not limited as the neo-classical theories suggest. A firm can create investment opportunities for itself through diversification into new profitable fields and can create new demand by research and marketing ventures.(1)

We have now ascertained that factors affecting both the firm's willingness and ability to grow are not predetermined and should be regarded as endogenous to the firm's management. The importance of the varying character of management must be considered. A firm which is conducted by growth-oriented management may be expected to grow faster than a firm with profit maximizing owner-management.(2) A skilful

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(1) This idea is put forward particularly strongly by Penrose in order to explain the characteristics of modern corporations. Penrose, The Theory of the Growth of the Firm, op.cit., Chapter VII.

(2) The importance of the non-pecuniary motives of managers as contrasted with the pecuniary motives of owner-managers has been widely discussed by several economists including Baumol, Cyert and March, Simon and J. Williamson. This problem of the motivational impact of the firm is discussed in Chapter VI below.

management can accelerate growth faster than other firms without affecting profit rate. On the other hand, an equally skilful management may obtain a higher profit rate than any other firms sustaining the same rate of growth. The former chooses to exploit a given opportunity by fast growth and the latter by a higher rate of return. It follows, therefore, that the magnitude and pattern of the association between profitability and growth may be expected to differ between individual firms according to the skill and the motivation of each management.

In Table 5.1 we list the regression correlation coefficients r^2 of average rates of growth on average rates of profit calculated for firms of different size groups (small, medium and large), of different degrees of concentration, and for different time periods. The 19 fastest growing firms are excluded from Part (1) of the Table because of their extreme performance already described.

There are of course, several different types of time period to which our observations may relate. One relationship is that in which the rate of return and of growth are expected to be associated in the same year. Another relationship perhaps is where the rate of growth is associated with profitability with two or three years' lag. Alternatively we may test a rather longer term relationship which would predict an association between the average of the variables over six to ten or more years. The first two relationships may be tested based on the profit maximization hypothesis referred to in Section I. In fact on an industry basis Stigler tested a set of regressions of relative increase in capital (book value of total assets) on both current and preceding years' profit rates for the period 1948 to 1957 for American manufacturing industries. In brief, he found that the current profit rate plays a negligible role in the regression equations but the relation between the preceding year's profit and growth is almost constantly positive and statistically significant. When the period of time lengthened and a two, three or four years' lagged relationship is examined, the correlation becomes either larger or smaller depending

on the period and industries studied.(1)

However, we are interested in the long-run association between profitability and growth. Accordingly, we are concerned with the relation between the long-run (each of our three six year sub-periods, and the whole 18 year period) average growth and the average profit rate of the same period.(2)

The magnitude of the association varies considerably between different size groups of firms and in different time periods. No association was found for any size group of firms in the first sub-period 1950-55 when firms in general grew fast and were enjoying high profitability.(3) Following the post-war boom there was still a high level of prosperity in the economy and an optimistic climate generally continued to exist in most manufacturing industries in the first half of the 1950's. The high level of immigration and the general confidence that a high level of activity would be maintained helped to provide businessmen with the anticipation of a continually growing market. This allowed the businessmen, in turn, to plan their investment programmes well ahead and permitted them largely to ignore short-run fluctuation in economic activity.(4) Bushnell states that radical changes were at work in the business environment. Expansion both within and between interstate market provided many firms with important opportunities for economies of scale which led to the introduction of new technology and advanced methods of management.(5) Under such unusually dynamic conditions business

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(1) Stigler, Capital and Rates of Return in Manufacturing Industries, op.cit., Chapter 4.

(2) We have also tested the relationship between growth rates (average of three six-year sub-periods and of the whole 18 years) and each year's profit rates for our 146 continuous firms. The relationship in general appears to be very weak.

(3) Average annual growth rates and profit rates of the three sub-periods and the whole 18 year period are:

	1950-55	1956-61	1962-67	1950-67
Growth rate (%)	14.8	15.3	5.6	10.1
Profit rate (%)	19.7	17.2	6.1	7.7

(4) Nevile, op.cit., and Smyth, op.cit.

(5) Bushnell, Australian Company Mergers 1946-1959, op.cit., pp.93-7.

motivations of management may differ from those holding under more stable and sedate circumstances.

It is expected that differences in motivation of management of monopolistic and competitive firms may be reflected in the varying association of profitability and growth. For example we thought that there is a greater necessity for firms in competitive markets to obtain external finance because their need for funds is likely to be more urgent than that of monopolists and oligopolistic firms operating various collusive agreements. But no obvious differences in the relationship are found between monopolistic and competitive firms.

Considerable differences are seen in the extent of profitability and growth association between firms of different size groups. (See Table 5.1 and Diagrams 5.2-5.4). The association is fairly strong among small-size firms for each time period except the first six years. But no such strong relation was found among firms on the medium and large size groups. Among large firms, in particular, the association was very weak in any period. Do these results suggest that there are some structural differences in the relationship between growth and profitability for large and medium sized firms as compared with small firms? If so, what are the economic implications of the observed differences?

SECTION III: Profitability-growth Association in Firms of Different Sizes

In testing the association between profitability and growth of firms, we are trying to examine the 'feedback' relationship between the two variables; how far does profitability cause growth, and in turn to what extent does growth cause profitability.

To begin with let us concentrate on the first part of the relationship and examine the importance of retained profit as a source for expansion of firms. Generally, firms finance their growth either internally, using retained profits, or externally, by raising money in the capital market or by obtaining loans from banks and other financial organizations. These are theoretically three major alternative sources of funds but in

practice the availability of the latter two sources is often limited from time to time depending on general economic conditions as well as the past business performance of the firm. Thus retained profit has been used as a major source of funds for the growth of industrial firms in Australia. Hall's study of Australian public company finance indicates that more than half the capital funds of his selected 253 public manufacturing firms in the period between 1946 and 1954 were obtained from retained profit and revenue reserves.(1) Similarly for more recent years, The Report of the Committee of Economic Enquiry indicates that aggregate company saving (undistributed profit and depreciation allowances) in the period 1953-54 to 1960-61 financed almost 65 per cent of fixed capital expenditure in Australia. If undistributed profits accruing to non-residents were included the figures would rise to 70 per cent.(2)

The importance of retained profit and other internally accumulated sources for financing investment outlays is also noted in our study. In Table 5.2 we calculated the proportional increase in net assets of our 146 firms in the period 1950-67 financed by (a) retained profit and (b) internal sources which include not only retained profit, but also other revenue resources of various forms and depreciation provisions. It is often suggested that firms regard revenue resources and depreciation provisions as another form of profit retention, or rather as methods to conceal profit for tax and dividend payment purposes. The latter information, (b), is therefore obtained in order to correctly measure the importance of profitability in financing the growth of firms, but it was available on a relatively comprehensive basis only for the third sub-period,

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(1) Hall, Australian Company Finance. Sources and Uses of Funds of Public Companies 1946-1955, op.cit.
The importance of retained earnings as a source of funds is also observed in studies of companies in the U.S.A. and the U.K. See for example, Lintner and Butters, op.cit., pp.252-264, B. Tew and Henderson, op.cit., and the Committee of the Working of the Monetary System, op.cit., pp.129-89.

(2) The Report of the Committee of Economic Enquiry, op.cit., Vol. II, H. 53, p.947. See also Mathews and Harcourt, op.cit. See also, P.J. Rose, Australian Securities Markets (Melbourne, F.W. Cheshire, 1969).

1961-67. In the table we see that on the basis of a six year average retained profit met roughly from one quarter to slightly over one third of capital requirements for the growth of net assets during the period studied. If we include other resources and depreciation provisions, the internally accumulated sources of funds substantially exceed actual net asset expansion in the 1961-67 period. The proportion of the increase in net assets financed by retained profit is highest in the third sub-period when both profitability and growth rates were considerably lower than in the preceding two sub-periods.(1)

An important feature revealed in Table 5.2 is that the extent of the expansion of the net assets financed by retained profit, and similarly by internal sources as a whole, differs considerably between small, medium and large sized firms. In spite of the widely suggested hypothesis that large modern corporations are particularly willing to rely on internal sources for expansion,(2) we find in the table that smaller firms tend to finance a larger part of their capital requirements for growth from retained profits and other internal sources.(3) This tendency appears to be more pronounced under less prosperous and less expansive conditions as in the period 1962-67.

It may consequently be expected that, ceteris paribus, the investment of smaller firms are more sensitive to profit than those of large firms, and that this is particularly so in periods of relative

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(1) It may be expected that, assuming short-run rigidity of dividend distribution, firms retain a relatively larger portion of profit in prosperous periods, and are thus able to finance a large part of their growth from retained earnings. Alternatively, however, it may be argued that under brisk economic circumstances external sources are likely to be more accessible to firms. Thus a management may rely to a greater extent for their capital requirements on new stock issues and loans. The latter view is more consistent with our results.

(2) See, for example, Galbraith, op.cit., Chapter IV.

(3) Similar observations are also noted in the United States of America and the United Kingdom by Lintner and Butters, and Tew and Henderson who suggest that retained earnings are a much more important source of expansion finance for smaller than for larger corporations. The explanation of such a trend may be found in Section I above. Lintner and Butters, op.cit., and Tew and Henderson, op.cit., Chapters 3 and 4.

Table 5.2

Retained Profit, and Revenue and Depreciation Provision as proportion of Net Assets increase: 1950-1967
146 Continuous Firms

Size in 1950(a)	(1) Net Retained Profit (£'000)	(2) Reserves and Depreciation Provision (£'000)(b)	(3) Increase in Net Assets (£'000)	(4) (1)/(3) (%)		(5) (1)+(2)/(3) (%)	
(i) 1950-55							
1	96		284	33.80			
2	411		1030	39.90			
3	872		4047	21.55	Average		
4	4183	(c)	15746	26.57	27.5		
5	7506		30568	24.56			
6	8241		43647	18.88			
7	5932		35477	16.72			
8	37503		65467	57.29			
9	11115		65829	16.88	Average		
10	2168		27211	7.97	22.2		
11	6188		49878	12.41			
All companies	84215		339184	24.83			
(ii) 1956-61							
1	170		421	40.38			
2	381		1077	35.38			
3	2334		6934	33.66	Average		
4	7398		42913	17.24	27.3		
5	8856	(c)	45978	19.26			
6	13229		73854	17.91			
7	9833		69387	14.17			
8	43779		84934	51.54			
9	24558		104167	23.58	Average		
10	8047		30873	26.06	26.1		
11	39074		256078	15.26			
All companies	157659		716616	22.00			
(iii) 1962-67							
1	222	205	276	80.43		156.77	
2	284	1308	349	81.38		364.10	
3	3444	5604	8291	41.54	Average	106.80	Average
4	8802	19867	13073	67.33	56.1	221.58	183.1
5	14820	23483	58735	25.23		128.87	
6	16939	36188	41782	40.54		120.67	
7	14875	32925	69753	21.32		75.92	
8	71558	32270	64953	110.17		116.26	
9	27043	89944	151550	17.84	Average	77.19	Average
10	10382	22703	36046	28.80	43.0	91.79	156.1
11	50835	530174	138608	36.68		419.17	
All companies	219204	794671	583419	37.57		183.40	
(iv) 1950-67							
1	488		981	49.75			
2	1076		2456	43.81			
3	6650		19272	34.51	Average		
4	20383		71732	28.42	33.9		
5	31182	(c)	135281	23.05			
6	38409		159283	24.11			
7	30640		174620	17.55			
8	152840		215354	70.97			
9	62716		321546	19.50	Average		
10	20597		94130	21.88	30.3		
11	96097		444564	21.62			
All companies	461078		1639219	28.13			

Table 5.2 Notes:

(a) There are no firms which fell into size groups 12 and 13 in 1950, i.e., net assets exceeding £51,200,000. For size classification see Appendix Table D.5.

(b) Includes all types of reserves (capital, revenue, etc.) and depreciation provision. Information is available for only 113 out of total 146 continuous firms.

(c) Information is not available for the majority of the firms in these periods.

stagnation. For this reason, it is therefore not surprising to find that the profitability-growth relationship is more pronounced among firms of small size than among medium and large size firms.

Let us now turn to the other side of the profitability-growth relationship, i.e. the effect of growth on profitability. In the preceding chapter we noted that the growth of firms is not a question of simply increasing production capacity along a smooth upward expansion path and producing more of the same products on a larger scale. It involves changes in various dimensions of a firm. The post-war economic growth in Australia witnessed such changes in both the nature and direction of expansion of firms in almost every industrial field.

It is generally believed that expansion into interstate markets, into new products and integration in both backward and forward directions have been achieved by firms after they succeeded in building up their trade positions and had obtained economies of scale in their principal markets.(1) Until towards the end of the 1950's the majority of firms in the manufacturing field had grown, more or less, simply pari-passu with the market expansion of their products.(2)

The Australian economy suffered its first serious problem of excess capacity in the late 1950's.(3) It was not the first post-war recession but the generally depressed conditions of the economy from late 1957 to mid-1959 placed numbers of firms in financial difficulties. Although the majority of businessmen were still optimistic in 1958 and the share market in general was buoyant, owners of shares in many risky small firms decided to switch to shares in large diversified companies.(4) Excess

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(1) Bushnell, op.cit., p.185.

(2) Karmel and Brunt, The Structure of the Australian Economy, op.cit., p.57.

(3) See the series of articles on 'The Australian Economy, 1956-62' published in Economic Record (May 1956 - March 1962) reprinted in Arndt and Corden (eds.), The Australian Economy, A Volume of Readings, op.cit., Part one.

(4) Bushnell, op.cit., pp.184-91.

capacity was slowly building up in various areas of manufacturing industry and prospects for rapid growth faded. Expansion opportunities became generally less attractive in established production lines in the period from late 1957 to mid-1959. Most firms with growth policies then took the initiative of diversifying their products by spreading into markets in other states, particularly integrating forward into distribution fields so as to maintain sales in adverse markets, and cultivating new markets most of which were formerly supplied by overseas manufacturers.(1)

This trend, which may be called 'defensive' diversifiaction, coincided with an increase in another type of diversification - diversification for growth. By the mid-1950's many firms had accumulated a large amount of retained profits during the extremely prosperous post-war period and began seeking opportunities to invest. Some, already operating on a fairly large scale in one market, decided not to increase their output in that market for fear of excess production and preferred to use their accumulated resources to move into related markets. In short, many firms in the late 1950's diversified their production lines either as a normal concomitant of the growth of successful firms in order to sustain and further to increase growth rates, or as defensive means of countering recessions in their established markets.

In order to estimate the extent of diversification introduced by our 146 continuous firms we classified the firms into 'single-trade' firms, and 'diversified' firms in Table 5.3. The latter category is further divided into three groups; 'integrated', 'related-product', and 'multi-product' firms. The general principle behind these groupings rests on the original classification of our '51 industrial groups'. We first classified those firms which are engaged only in one of the 51 industrial groups into 'single-trade' firms (Column 1 in Table 5.3). Then, the remaining firms were further classified into: (i) 'integrated' firms whose operations extended vertically either from raw material to processing fields, or from

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(1) Ibid.

finished products to distribution fields; (ii) 'related-product' firms which manufacture products related both technically and in the consumers' eye such as television and radio receiver manufacturers engaged in the industrial motors manufacturing industry, or biscuit manufacturers also engaged in bakery activities; (iii) 'multi-product' firms which produce different goods without any obvious relationship between them, e.g. the case of a sugar refiner producing building materials. If a firm may be classified in more than one of the last three categories (colmn 2a, 2b and 2c in Table 5.3) we place it in the category furthest right in the table. For example, a firm which is both an 'integrated' and 'related-product' firm, is placed in the latter category.

The concept of these categories may appear to be ambiguous and some arbitrary decisions have had to be employed.(1) The results of Table 5.3 do not refer to those firms which diversify their business interest by investing in other companies unless their investment amounts to 50 per cent of the shares in the other firm which is then classified as a subsidiary. Also the table does not indicate the degree of importance of diversified products among the firm's total activity. Thus a firm may be classified as 'multi-product' even if its diversified lines contribute only one per cent of its income. Yet in spite of these weaknesses we are able to detect several important features.

The relationship between size and the extent of diversification is striking. All but one of the small firms (size groups 1-3 inclusive on a 1950 basis) are 'single-trade' firms. The number of diversified firms increases with the increase in size of firms and by the time we reach the large-medium category (size group 6) we find that half of the firms are diversified. Moving into the group of large firms (size group 7 and upwards) we see that most firms are either integrated or engaged in more

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(1) We base our definition of diversification on the suggestions of Penrose, op.cit., pp.107-9.

Table 5.3

Distribution of 'Single-trade' firms and 'Diversified' firms by Firm Size Classes, 1967
146 Continuous Firms

Size classes in 1950* (£'000)		(1) Number of 'Single-trade' firms in 1967	(2) Number of 'Diversified' firms (a) 'Integrated' firms	(b) 'Related-product' firms	(c) 'Multi-product' firms	(3) Total 'Diversified' firms in 1967
1	0-49	4	..	..	..	..
2	50-99	8	..	..	..	..
3	100-199	15	..	1	..	1
4	200-399	20	5	5	1	11
5	400-799	24	3	4	..	7
6	800-1,599	12	6	5	2	13
7	1,600-3,199	2	5	1	2	8
8	3,200-6,399	1	4	5	1	10
9	6,400-12,799	1	2	1	2	5
10	12,800-25,599	..	1	..	1	2
11	25,600-51,199	..	..	..	2	2
All companies		(87)	26	22	11	(59)

* There are no firms which fell into size groups 12 and 13 in 1950, i.e., net assets exceeding £51,200,000.

Sources: Department of Trade and Industry, Developments in Australian Industry, op.cit. 1956-57 to 1966-68, and Jobson's Investment Digest Year Book, op.cit. 1969.

than one industry.(1) It seems from several scattered pieces of information that many firms began expanding into markets other than their primary fields when they reached the 'medium-sized' category (size groups 4-6 inclusive on a 1950 basis).(2) The diversification of many medium sized firms was achieved by acquisition of other firms, particularly in the period between the late 1950's and the early 1960's. No doubt at the same time larger firms which were already diversified further expanded in both vertical and lateral directions.(3) Quite often diversification of large firms was directed towards new markets which were formerly supplied by imported products.(4)

Whether such diversification was introduced as a defensive measure or simply for growth purposes, diversified firms as a whole achieved considerably higher growth rates than 'single-trade' firms in the 18-year period.(5) Fifty-nine diversified firms grew on average by 15.5 per cent per annum while 87 'single-trade' firms managed to grow only at 11.0 per cent per annum between 1950 and 1967. The difference between the

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(1) Based on the study of 721 large manufacturing firms in the United States of America in 1954, M. Gort found that size of firm showed a strong positive association with the number of industries in which companies maintained establishments. Based on statistics of 1935 and 1955, Downie also found a similar relationship among British manufacturing firms, i.e. the smaller is the firm the less likely it is to be a multi-trade firm. M. Gort, Diversification and Integration in American Industry, National Bureau of Economic Research (Princeton Univ. Press, 1962), Chapter 4, and Downie, op.cit., Chapter XII.

(2) The main sources of evidence are: Department of National Development, The Structure and Capacity of Australian Manufacturing Industries, 1952, Department of Trade, Development in Australian Manufacturing Industry, 1956-57 to 1967-68, and Jobson's Investment Digest, op.cit., 1950-67.

(3) Following Robinson, 'lateral' expansion indicates integration into related and different activities. Robinson, The Structure of Competitive Industry, op.cit., pp.114-6. B.L. Johns and W.P. Hogan suggest that there was an evident extensive forward and backward integration in several manufacturing fields in the late 1950's and the beginning of the 1960's. B.L. Johns and W.P. Hogan, 'A Theory of the Growth of the Firm', Economic Record, Vol. 37, (June 1961), pp.171-82.

(4) Department of Trade, Development in Australian Manufacturing Industry, op.cit.

(5) Using 111 manufacturing firms in America, Gort has studied the relationship between growth and diversification and he finds that the observed relationship between the two variables does not suggest a clear-cut pattern. Gort, op.cit.

two groups of firms is more pronounced among medium sized firms - the average growth rate of diversified firms is 18.3 per cent as against 11.0 per cent among non-diversified firms in this size group. On the other hand differences in profitability between diversified and 'single-trade' firms are marginal both for the total 146 continuous firms and for medium-sized firms (Table 5.4).

Turning back to the profitability and growth relationship, we see a considerable difference in the magnitude of the association between the two groups of 'single-trade' and 'diversified' firms. Among 'single-trade' firms a fairly strong association between profitability and growth is found for all periods except the first six years. But no such association appears for 'diversified' firms in any of the time periods. The growth-profitability hypotheses do not appear to explain much of the investment behavior of 'diversified' firms.

Let us try to reduce all the preceding arguments in this chapter into a tentative hypothesis.

We found that investment plans of small firms (net assets size less than £400,000 in 1950) are susceptible to net inflow of funds which is indicated by their greater reliance on internal finance for expansion. We also found that these small firms seldom invest in other than their primary fields. As long as the market prospect is bright these firms invest so as to obtain profit which in turn is used for growth. Profits become a condition of successful growth and investment is made on the basis of profitability. These firms are not interested in expansion <u>per se</u> and they never invest in expansion if the return on the new investment is very low. On these grounds, a large part of the behavior of these small firms can be explained by 'profit motives' or 'profit maximization' hypotheses.

When small firms grow and move into the 'medium-sized' category (net assets size between £400,000 and £1,600,000 in 1950) they encounter a choice between two alternatives; to continuously invest in the same market, or to diversify their products and move into new markets. We may loosely call firms making the first choice 'profit maximizers' and those

Table 5.4

Profitability and Growth of 'Single-trade' and 'Diversified' Firms, 1950-67
146 Continuous Firms

	'Single-trade' Firms			'Diversified' Firms		
	No. of Firms	Average Annual Profit Rate (%)	Average Annual Growth Rate (%)	No. of Firms	Average Annual Profit Rate (%)	Average Annual Growth Rate (%)
87 Medium-sized firms*	56	7.2	11.0	31	7.3	18.3
146 continuous firms	87	7.6	11.0	59	7.9	15.5

Note: * Includes firms of which net assets between £400,000 and £1,600,000 (size groups 4 to 6 inclusive) in 1950.

making the latter, 'growth maximizers'. In this context we use these terms not because one type of firm is solely profit-oriented and the other solely growth-minded, but because the latter is likely continuously to grow faster than the former which foregoes certain growth opportunities. The firm's decision to diversify depends not only on the motivation and aim of management but also on the skill of management. Some firms may want to diversify but their managements are not competent enough to succeed. Diversification is not the only possible means of increasing the resources of medium-size firms. A firm may be able to grow up to a certain size by obtaining a larger part of its primary market or simply by increasing its scale of operation pari passu with the secular increase in demand in its primary market. But if it wants to continue to grow it must eventually diversify its production because such a move will continuously present the firm with opportunities for profitable new investment while at the same time maintaining and expanding the primary lines to which it has already extensively committed its resources.

When a firm makes the decision to diversify its activity or activities, it must see profitable opportunities in the new market(s). But the calculation of such 'profits' may not be based on current opportunity cost. Diversification is continuously promoted in many firms and their ex post profitability and growth performances often do not conveniently fit within the realm of profitability-growth hypotheses.

CHAPTER VI

MANAGEMENT AND THE GROWTH OF FIRMS

In the preceding four chapters, we have examined in detail the factors determining the growth of firms within a particular analytical framework, i.e. the relationship between the growth of firms and their size, profitability and the structure of the market in which they operate. We have raised and attempted to answer several questions: Are large firms more profitable than smaller firms? Do large firms grow faster than smaller firms? Are there any relationships between profitability and growth of firms - if so, do the relationships vary between firms of different size classes, industries and over different time periods? Concerning different types of market structures in which firms operate, we also asked if firms in concentrated industries behave differently from those in less concentrated markets - in other words, are monopolistic and oligopolistic firms more profitable and do they grow faster (or slower) than atomistic firms?

The larger part of the study in the preceding chapters was empirical, using Australian company data, and we feel that several important discoveries were made. In this final chapter we offer tentative theoretical suggestions concerning the growth of firms based on our observations and discoveries. In order to arrive at economic implications of general interest, the empirical results are referred to without attaching detailed qualifications. Such qualifications, however, may be found in the appropriate parts of the preceding chapters.

SECTION I: Traditional Approach

Traditional theory suggests that there is an 'optimum' size which provides firms with minimum unit cost and with maximum profits. It follows, therefore, that an optimum size is the one to which all profit-maximizing firms should tend, and growth of a firm may be explained merely by the movement towards such an 'optimum' size.(1)

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(1) Concerning the best size of the producing unit, the optimum scale, see Robinson, The Structure of Competitive Industry op.cit.

Today, however, we observe that firms become larger and larger and that the largest firms in the economy are continuously growing. Are these continuously growing large firms still on the way towards their 'optimum' size and hence still experiencing economies of scale?

The problems of economies of scale have been extensively discussed by many writers who analyse the nature of the 'optimum' size of firms in terms of the economies of size arising from the optimum (or 'best') 'production', 'financial', 'marketing' and 'managerial' units.(1) With regard to the first three factors several empirical studies indicate that there is generally a decline of the production, financial and marketing costs per unit of output as the scale of plant or firm increases, or at least find no sign of increase in unit cost with increase in scale.(2)

The advantages of multi-plant firms arise from economies of 'management'. These result from the sub-division and specialization of managerial functions and the mechanization of certain administrative processes which enable firms to use intensively their existing managerial and entrepreneurial resources and to 'spread' overhead costs. It is, however, often suggested that there are limits to such gains.(3) Average costs of production and distribution may continuously fall with increases in output due to the economies of scale in the 'production', 'financial' and 'marketing' fields, but average management cost eventually may begin to rise when a firm reaches a certain size. This is because as

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(1) There are many works on the subject of economies of large scale operation. They include, Robinson, ibid, Marshall, Principles of Economics, op.cit., P.S. Florence, The Logic of Industrial Organization (London: Kegan Paul, 1933) and The Logic of British and American Industry, op.cit., F. Machlup, Economics of Seller's Competition (Baltimore: Johns Hopkins Press, 1952). More recent works include C. Smith, 'Survey of the Empirical Evidence on Economies of Scale' in Business Concentration and Price Policy, op.cit., and G.J. Stigler, 'The Economies of Scale', Journal of Law and Economics. Vol.1, (Oct. 1958), pp.54-71.

(2) See for example, Smith, 'Survey of the Empirical Evidence on Economies of Scale', Bain, Barriers to New Competition, op.cit., Chapter 3, and W.S. Comanor and T.A. Wilson, 'Advertizing and Advantages of Size', American Economic Review, Papers and Proceedings, Vol.59 (May 1969), pp.87-89.

(3) See our references in footnote (1) above.

size of the firm expands, additional managerial personnel are required to fulfil more and more specialized functions and the problem of co-ordinating their work will arise. Diseconomies of scale in managerial services will thus check firms' continuous growth. The argument is old, but it still prompts much discussion. It is the burden of this chapter to examine the question of management-imposed limitations on the growth of firms.

Recently Monsen and Downs tentatively put forward a new hypothesis concerning decision-making in the firm.(1) They stressed the importance of 'control loss' in the co-ordination of management in large firms. According to them diseconomies of large management which bring relatively low profit returns on capital are attributable to two factors in large corporations; i) large firms are likely to develop bureaucratic managerial structures to cope with their administrative problems, and such structures cannot be perfectly controlled by the men in charge of them - i.e., a technical inefficiency develops, and ii) such structures also provide top management with inevitably biased information which reflects various desires and ideas of personnel at varying levels of the managerial echelon. These tendencies cause systematic deviations from whatever goals the organization is ostensibly pursuing - i.e., technical and motivational inefficiencies develop.

This argument by Monsen and Downs and the arguments of other advocates of managerial diseconomies in large firms appear to be based

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(1) R.J. Monsen and A. Downs, 'A Theory of Large Managerial Firms', Journal of Political Economy, Vol.73 (June 1965) pp.221-36. Apparent empirical backing for the argument may be found in R.J. Monsen, J.S. Chiu, and D.E. Cooley, 'The Effect of Separation of Ownership and Control on the Performance of the Large Firm', Quarterly Journal of Economics, Vol.82 (August 1968) pp.435-51. But D.R. Kamenschen brings forward countervailing evidence. See, D.R. Kamenschen, 'The Influence of Ownership and Control on Profit Rates', American Economic Review, Vol.58, Part 1 (June 1968) pp.432-47.

mainly on three assumptions:(1)

1) The administrative work of management has a pyramidal form with one single apex and the principle of division of labour cannot be applied at this level.
2) At the apex, top management or other forms of supreme authority within firms must have comprehensive knowledge in order to pursue the goals of the firm, and
3) The supply of top management to a firm is not perfectly elastic.

Counter evidence to the first assumption is found in many firms other than very small organizations, for multi-centred systems of decision making are widely employed in various corporations. Although top management or other supreme decision making authorities may have ultimate responsibility over the general policy pursued by the firm, it is not always necessary to set all the problems before the top co-ordinators in order to obtain the decision from them. Delegation to subordinate management is possible and the larger the size of management the more extensively various devices of delegation will be exploited. Delegation involves division of labour between the various functions of management. Because of the division of the firm's activities into distinct spheres - production, sales, purchasing, research, finance and public relations - or, in the case of multi-plant or multi-firm (subsidiary companies) corporations, the separation of each product division, firms possess more than one single top managerial authority. Each has its own distinct viewpoint due to its differing function within the firm. Ultimate company policy is determined by the agreement of these co-divisions, i.e., the firm's

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(1) The basic assumptions of the proposition that management is the limiting factor of the size of firms are intensively discussed by several economists. See, for example, N. Kaldor 'The Equilibrium of the Firm', Economic Journal, Vol.44 (March 1934) reprinted in Essays on Value and Distribution, (London: Gerald Duckworth, 1960), E.H. Chamberlin, 'Proportionality, Divisibility and Economies of Scale', Quarterly Journal of Economics, Vol.62 (Feb. 1948) pp.229-62, and N.S. Ross 'Management and the size of the Firm', Review of Economic Studies, Vol.19 (1952) pp.148-54.

decision is a product mix of the co-divisions.(1)

Thus, considering the second assumption noted above, the availability of the device of delegation also indicates that top management or the supreme authority within the firm does not necessarily have to acquire all information or be fully acquainted personally with every problem in order to make decisions. Top management may therefore specialize only in performing the supreme co-ordinating function which is to give certain broad principles or guidelines to the whole range of the firm's activities. In order to perform such services they may rely on advice given by their subordinates with detailed knowledge of particular problems. Similar division of management specialization can be employed in decision making within the various managerial echelons below the level of top management.

Managerial services within a firm may be divided into two distinct functions. One is that required for ordinary operations, i.e., 'supervisory' services which are needed to ensure that any member of the firm does the job expected of him in order to carry out the overall purpose of the corporation. The other function is that of planning the policy of the firm, i.e., the 'decision making' function. Granted the fact that there is a separation of ownership and control in larger firms, certain conflicts of interest between shareholders and management may exist and the firms will not necessarily perform in the best interest of the owners (profit maximization). However this is not a problem of inefficiency. Monsen and Downs' 'motivational inefficiency' caused by conflicting interests between personnel in different positions is attributable to 'bad' management and not to the large size of the firm. In Monsen and Downs' terms, if their 'middle' managers concentrate

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(1) For example, in a wool textile firm, the use of wool or synthetic fibres at a given time may depend largely on price of the two alternative fibres and the consumers' choice of the final product. But if the firm is facing an acute need to expand its market share in synthetic fibre textile fields the preference based on the comparative price of the two fibres and the consumers' choice may be overridden by the sales drive policy.

on doing whatever most pleases and impresses their superiors - the top management - in order to obtain higher paying positions,(1) the consequent inefficiency should be blamed on the poor 'supervisory' capacity of top management. If, on the other hand, the self interest of 'lower' management personnel leads them to supply underestimated cost data to middle management and the latter make their decisions accordingly(2) the resultant inefficiency is the responsibility of bad 'decision making' on the part of middle management. Neither case is related to the large size of firms. 'Motivational inefficiency' itself does not impose any limit to the growth of firms.

Thus, concerning the third assumption above we suggest that with progressive subdivision and decentralization, the managerial function will cease to be a fixed factor and firms may continuously grow large without suffering from any increasing cost of managerial services.

Our argument presented above has so far provided no substantiation of the hypothesis that diseconomies of scale arise as a firm reaches a certain size. Moving from single-product firms to multi-product firms, we find additional advantages of large size. Average cost of manufacturing new products (products to be added to a firm's production ranges) may be compared between small and large firms. There are several reasons to expect the presence of economies of size with respect to expansion into new markets.(3) Compared with small firms, large firms generally are able to support an extensive research organization to develop new products and are better equipped to market the new products through extensive advertizing programmes.

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(1) Monsen and Downs, op.cit., p.234.

(2) Ibid, p.235.

(3) The advantages of large size in introducing new products are discussed by Penrose under the heading of 'economies in expansion'. Penrose, The Theory of the Growth of the Firm, pp.95-9. See also Bain, Barriers to New Competition, op.cit., Chapters 3 and 4.

In addition the imperfect nature of the capital market already noted makes it harder for smaller firms to raise the finance to undertake the production of new goods. As for the risk attached to the introduction of new products the effect of failure and loss are normally greater for small firms which may even face bankruptcy as the result of losing a sum which a large firm could recoup from its other lines.

At the beginning of this section, we noted that in traditional theory the growth of a firm was explained by the movement towards optimum scale. Beyond the optimum point a firm must experience rising cost which prevents any firm from growing. The idea of an 'Equilibrium position' and optimum scale disappears as soon as we discard i) the notion of 'fixed factors' which cause increasing long-run costs of production, or ii) the restriction of a firm to one product with its implication that the downward sloping market demand curve will eventually cause decreasing revenue. Our examination in this section indicates no sign of a long-run U-shaped cost curve, and since firms expand into various markets pursuing profit we have no reason to expect that large firms obtain smaller rates of return. Alternatives to the traditional explanation of the growth of firms must be sought.

Another weakness of the traditional theory of the firm lies in its method of approach. Assuming that all other economic variables are held constant it examines the comparative advantage of being one particular size, and consequently growth is treated as a mere adjustment from one size to another in search of profit and cost advantages. There is no explanation of the growth process itself - the speed and the magnitude of growth of a firm.

In Chapters III and IV we observed that rates of profit and growth differ considerably between firms and only a part of the differences appears to be explained by economic factors such as the particular industries in which they are engaged, the size of firms and their degree of market control. We suggested the importance of differences in motivation and the quality of management in explaining the observed profit and growth divergences. The wide differences in

annual average profitability and growth of individual firms were shown in Diagrams 5.1 - 5.12 on p.130 above. Five factors were examined as possible explanations for the observed wide differences in profitability and growth performances of the firms. First, differences in size (initial size) of firms may result in different business performances because of possible economies of large scale operation. Second, there may be wide differences between monopolistic and oligopolistic and atomistic firms in their capacity to exploit given profit and growth opportunities because of the differences in their market controlling powers. Third, differences in market and other economic conditions which vary from industry to industry and over time may present different profitability and growth prospects to firms in different industries. Fourth, the observed differences in business performances may largely be caused by chance factors. Some firms may be able to grow fast with satisfactory profit because they have been lucky while others which failed either to grow or make profit were merely unfortunate. Fifth, the differences in business performances of the firms may largely be attributable to differences in the internal conditions of firms, i.e. management.

Let us recapitulate our findings concerning these five possible explanatory factors with the aid of the diagrams. In Diagrams 5.2 to 5.4 the annual average profit and growth performances of firms were plotted in three different size groups, small, medium-sized and large in that order. The diagrams showed some differences in profitability and growth of the firms between the three groups. That is, small firms generally appeared to obtain somewhat lower rates of growth as compared with firms in the two larger size groups, and their profitability is higher than that of medium-sized firms but slightly lower than that of large firms. This difference in general tendency was, however, relatively small and the largerpart of the observed wide differences in profitability and particularly growth experiences of individual firms was still left unexplained.

In Australia, size and market controlling power are generally closely related, at least in the period studied, i.e., large firms are mostly monopolists or oligopolists in their main markets.(1) In general firms in concentrated industries appeared to obtain marginally higher profits(2) and to grow faster than those in unconcentrated industries.(3) Part of the reasons for the generally faster growth of monopolists and oligopolists may be attributable to their advantages of large size rather than their market controlling power. But in any case, the extent of market control estimated simply by market shares of firms was found to explain only a small part of the observed profitability and growth of individual firms.

Concerning differences between the industries in which firms are engaged, Diagrams 5.5 to 5.12 indicate the differences in profitability and growth of firms in eight major industrial groups. Again we found small differences in the experience of individual firms in these industrial groups. The differences between industries appeared to have relatively little bearing on differences in profitability and growth of individual firms. Among the eight major industrial groups, the difference in average profitability is only three per cent between the 9.6 per cent per annum of Newspaper, etc. and the 6.6 per cent per annum of Textile, etc. industries, and firms such as Genetex Ltd. and Hilton Co. in the latter industry(4) earned much higher profit rates (16.2 and 11.2 per cent) than did Mirror Newspaper (4.8 per cent) in the former.(5) For growth rates, the difference is larger, ranging from the 15.1 per cent in Cement,

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(1) See Section III in Chapter II.

(2) See Table 3.8 on p.65 above.

(3) See Table 4.4 on p.97 above.

(4) These are not the two most profitable Textile companies but are given as examples of profitable firms which also experienced high average annual growth rates of 15.4 and 15.1 per cent respectively.

(5) Mirror's average growth rate was 6.2 per cent per annum.

etc. to 6.3 per cent in Textile, etc. yet we still find Valley Worsted Mills[1] and Genetex Ltd. in Textiles growing faster (16.7 and 15.4 per cent) than Swan Portland Cement (9.6 per cent) in the Cement industry.[2]

In contrast to inter-industry comparisons intra-industry differences are extremely wide. For example in the Textile industry which showed the lowest rates in both profitability and growth, the difference in profit rates between the highest and lowest firms exceeds 20 per cent (15.4 to -4.8 per cent) while the difference in growth rates is almost 19 per cent (16.7 to -2.0 per cent).[3] It is important to note that if the industries are more narrowly classified into our '51' industrial groups, and firms of the same size groups are compared we still find wide differences in profitability and growth. In other words, among firms which are of roughly the same size and are engaged in almost the same line(s) of business such as manufacturing soft drinks or chocolate, we find that some grew fast with satisfactory profit over the 18 years studied while, on the other hand, others not only failed to grow but also suffered a trade loss. In Chapter V we demonstrated this by comparing firms producing wool textiles and paperboard. Let us study these same examples again in Table 6.1 in order to examine the possible causes of differences in the business behavior of firms.

All four wool textile firms in the table are engaged in manufacturing various types of woollen and worsted woven cloth and knitted cloth. Their production processes are also almost the same and include spinning yarn for their own requirements as well as for outside sales. Their sizes are comparable and place them in the medium size group in their unconcentrated industry.

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(1) Valley Worsted Mills' average profit rate was 7.6 per cent per annum.

(2) Swan Portland Cement's average profit rate was 8.8 per cent per annum.

(3) See Diagrams 5.5 to 5.12 on p.130.

Table 6.1

Profitability and Growth of Selected Wool Textile and Paper-making Firms, 1950-67

Name of Company	Annual Average Profit Rate (%)	Annual Average Growth Rate (%)	Size of Firms in 1950 (£'000)	Production Processes Undertaken
Wool Textile				
Ballarat Woollen and Worsted Co.	2.0	5.9	248	Spinning and weaving
Onkaparinga Woollen Co.	8.9	11.1	348	Spinning and weaving
W.A. Woollen and Worsted Mills	0.1	-2.0	430	Spinning and weaving
Valley Worsted Mills	7.6	16.7	733	Top-making, spinning and weaving
Paper-making				
Tasmanian Board Mills	4.0	7.5	631	Owns timber resources
Cellulose Australia Ltd.	8.3	14.0	474	Owns no timber resources

Sources: Department of Trade and the Bureau of Agricultural Economics, The Australian Wool Textile Industry (Industrial study series 1961), Department of National Development, The Structure and Capacity of Australian Manufacturing Industries, (1952) Chapters 4 and 15.

Both of the paper-making firms manufacture paperboard of the same type with almost identical production techniques. They are medium sized firms in an oligopolistic market. However, Tasmanian Board Mills owns timber resources from which it obtains pulpwood for its requirements. Also its association with large firms in the shipping and airline industries is very close through interlocking directorships which may provide it with easier finance of capital requirements. The other firm, Cellulose Australia Ltd., has no timber resources of its own and depends for its supply of pulpwood on State-owned and private plantations. It has no association with other firms to any major extent.

Despite our narrow definition of the product and industry boundaries of these firms it might still be argued that the firms in our two examples are still not operating in exactly the same markets and business environment. In the wool textiles case it could be asked whether the higher profitability and faster growth of the Onkaparinga Woollen Co., for example, is due to the fact that it mainly produces relatively high quality blankets whereas the Western Australian Worsted and Woollen Mills mainly produces standardized wool cloth. Alternatively, is the poor performance of Western Australian Worsted and Woollen Mills attributable to its greater reliance on the West Australian market in contrast to the South Australian and Victorian companies? However, neither explanation is acceptable in view of the fact that a) within the relatively long period of 18 years with which we are concerned the manufacture of blankets and wool cloth of various quality ranges is a technically possible alternative for any of these four firms, and b) the Western Australian Worsted and Woollen Mills has a subsidiary company in Victoria and could therefore have shifted its main market from West Australia to Victoria any time during the period had it so desired.

In the paperboard industry it could possibly be argued that ownership of a pulpwood forest may have made Tasmanian Board Mills less flexible in its raw material purchases with resultant lower profitability and slower growth compared with Cellulose Australia Ltd. Or perhaps the directors who were also on the boards of other firms forced the company to adopt more conservative policies? But again given the length of the period we are studying, such considerations as the first are misplaced for Tasmanian Board Mills had ample time in which to sell its freehold if it hindered its performance. On the other hand if interlocking directorships were disadvantageous then this factor must come within the category of 'bad' management.

We are now left with the essential question; what determines market conditions and the business environment; are they externally determined in such a way that individual firms are unable to influence them? The preceding examples of wool textile and paperboard making

firms indicate some important aspects of the matter. Among those factors which are generally regarded as being part of the economic environment in which firms operate a number are in fact not entirely external and are susceptible to individual firms' influence. As we study in detail the business performances of successful (higher profit and/or faster growth) firms in comparison with unsuccessful firms' operations within the same industry boundaries and of similar size we find many differences, some large, some small, in their methods of finance, production processes, marketing devices and the quality and prices of their products. The majority of these differences appear to be alternatives open to each firm over a time period as long as 18 years. Differences in production, financial and marketing methods employed by individual firms are in fact mostly the very results of the firms own choices. They are determined by the management of firms and thus reflect the differences in managerial policies. Therefore, there seems to be little sense in arguing that the poor performance of a particular firm during a relatively lengthy period is largely due to the sluggish condition of the market in which it engages, or to shortage of a particular raw material or techniques which it requires, etc. Market conditions and other environmental factors certainly influence the success of a firm and some of these factors are outside the managements' control, but they explain only a part of the observed inter-firm differences in profitability and growth experience.

In Chapter III we noted a consistency in profitability of individual firms over a long period; that is, firms which made relatively high profit in one period (six-years) are likely to maintain high profit in the next and, on the other hand, poor performance of firms in one period tends to persist in the next period as well. This consistent performance indicates that chance elements such as good or bad luck appear to explain only a minor part of the observed differences in profitability of the firms. Rather it indicates that such persistent higher (or lower) rates of return are a result of systematic causes.

We suggested that a large part of the systematic causes exist within a firm, i.e., differences in management.

It is important to note that this persistent performance is found only in the profitability of firms, and is not paralleled in the growth of firms to any significant extent. Some firms grow rapidly in one period but their expansion rate normally declines in the following period, and conversely slow growth in one period is followed by fast growth in the next. It is possible to argue that a firm may succeed in obtaining higher profit over a longish period by accepting slower growth because it is a profit maximizer. On the other hand another firm may grow fast by depressing its earning rate for a certain period because it is a growth oriented firm. In other words the differences in profitability and growth experience between firms are mainly the results of differences in maximization goals. However, the observed absence of consistent growth performance of firms over a long period indicates that differences in profitability and growth between individual firms cannot be entirely explained in this manner.

Our argument in this section indicates strongly that the observed wide inter-firm differences in profitability and growth are largely caused by factors internal to firms. Firms choose their products, markets, methods of distribution and finance, and their choice is revised from time to time. These internal decisions, which reflect differences in managerial attitudes and skills, appear to explain a large part of the differences in business performance of firms.

SECTION II: Managerial Contribution to the Growth of Firms

The importance of 'entrepreneurs' or 'management' in the explanation of the behavior of firms has long been recognized, and their responsibility for the vitality and efficiency of the free enterprise economy has also often been stressed. For example, Robinson ends his book, The Structure of Competitive Industry, the prime object of which lies in examining the effects of scale, with

the following statement:

> ' ... I regard it as a sad consequence of the habit of drawing exaggeratedly steep two-dimensional cost curves, relating costs exclusively to quantities, that many economists tend to overrate the importance of scale and to underrate the importance of any other factors besides scale in determining costs. ... I do not myself believe that the immense differences between American production per head and British production per head in manufacturing industry are primarily the consequence of scale. ... I would explain the differences in terms rather of the tempo of work, of capital per head, of enterprise in the provision of capital, and of better organization'. (1) (My italics).

Yet despite the frequency of such references to the important role of entrepreneurial and managerial functions in the theory of firms, little convincing analysis or explanation has been offered about the supply of management personnel, their behavior as revealed in decision making, their attitudes towards risks, the basic sources of their ideas, and the measurement of their skill and ways of improving it. Rather, the contribution of entrepreneurial and managerial services to the business performances of firms has often been used merely, and quite ambiguously, as a 'catch-all' or 'residual' which serves to fill the unexplainable gap left by other economic factors.(2)

In the following we tentatively review the ways in which entrepreneurial and managerial services may significantly affect the growth of firms. In other words, we ask: What is the contribution of entrepreneurs and management to the profitability and growth performance of firms?; What is 'good' management as against 'bad' management?; Is 'good' management 'safe' management?, 'ambitious' management?, or what?

It is by no means easy to define what is 'good' and what is 'bad' management. Although, as we will see, the 'quality' differences of management are of strategic importance for the successful

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(1) Robinson, op.cit., p.155.

(2) Recently, however, several economists such as Baumol, Penrose, Marris and Leibenstein have devoted themselves to examining the managerial functions in investment decisions and other economic activity of firms and attempted to integrate these functions into economic analysis. For references see Chapter I Section I above.

utilization of production opportunities of the firm, the yardstick of successful management cannot simply be measured by high recorded earning rates or expansion rates. While arguing that 'good' management still succeeds in achieving its goals in any industry in the period we have studied, firms encounter, as we will see later, various internal and external changes as they grow and new problems emerge which call for adjustments in their production, finance, distribution and other business methods. The extent and the difficulties of the adjustments vary between different stages of firms' growth as well as market circumstances. Thus earning power and/or growth rate of firms may temporarily be depressed in the process of the adjustments as well as because of the 'mismanagement' connected with over- or under-estimation of production costs or demand prospects, maladjustment to changes in consumers' taste, delays in adopting new technology and so on.

Another difficulty in deciding between 'good' and 'bad' management should be noted. Thus we come across firms, particularly small ones, which do not always attempt to make more profit if the resultant growth seems likely to bring drastic changes in managerial powers and reduce its control over the firm. These firms may be conducted by careful management free from mistakes in estimating demand, cost, etc., but lacking any strong desire for expansion. They are thus unlikely to grow large. Absence of desire for growth is no indication of incompetence of management.(1)

Many economists distinguish managerial functions from those of 'entrepreneurs' on the basis that the 'manager' is the individual who oversees the ongoing efficiency of continuing processes. Thus his task is to see that available processes and techniques are combined efficiently at current output levels and for future output levels that are already in

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(1) We see examples in some small family firms where the business often provides a way of life for the family. If a family does not want to change its way of life, the business may grow only up to a certain point because further growth requires the admission of outsiders. Because of their limited size these firms are relatively unimportant in most industries.

prospect. On the other hand, the 'entrepreneur's' function is to locate new ideas and put them into effect in the Schumpeterian fashion.(1) In our study we consider both functions. By 'management' we lump these functions together because we are concerned with the contribution of the individuals who both conduct and provide for the expansion of the firms.

On page ~~135~~ 153 above we divided 'managerial' activities into two broad categories of 'supervisory' functions and 'decision-making' functions. 'Supervisory' functions concern only routine services of coordinating and operating established production processes and techniques. In other words the production function is given. 'Decision-making' functions, on the other hand, concern planning the policy of firms and creating, searching for, and establishing production processes and making optimum input decisions which best serve the goals which the firm pursues. Production possibility loci are not predetermined. Concerning 'decision-making' functions in Section I above, we have already seen examples of differences in managerial choices of production, financial and marketing methods in the wool textile and paper-making industries.

H. Leibenstein conducted an extensive theoretical as well as empirical survey of the supervisory function of management and suggested a concept of 'X-efficiency'.(2) He argued that:

> '. . . firms do not produce on the outer bounds of their production possibility surface but well within it. Thus firms frequently produce less than maximum output with given inputs, and at various times they increase output without increasing inputs'.(3)

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(1) See for example, Baumol,'Entrepreneurship in Economic Theory', op.cit.

(2) H. Leibenstein, 'Allocative Efficienty vs. "X-efficiency"', op.cit., and 'Organizational or Frictional Equilibria, X-efficiency, and the rate of Innovation' Quarterly Journal of Economics, Vol. 83 (Nov. 1969) pp.600-23.

(3) Although Leibenstein does not only confine his argument of 'X-efficiency' to supervisory functions but includes some of 'decision making' services as well, the major element of his argument is relevant to our present concern. 'Organizational or Frictional Equilibria, X-efficiency, and the rate of Innovation', ibid., p.600.

In short his argument indicates that no one expends the maximum effort in the execution of his job. Individuals and organizations neither work so hard and effectively as they could, nor are their efforts maintained at a constant level. Thus they create 'inert areas' in various stages of the production processes of firms.

Several empirical works have been conducted to test the hypotheses of 'X-efficiency' and similar lines of thought.(1) For example, in a survey on profitability and sales behavior of 22 restaurants in America, J.P. Shelton found that owner controlled firms generally obtain higher profit rates than management controlled firms.(2) Since the differences in growth rates between these two types of firms are not studied, parts of the differences in profitability may simply result from the differences between profit-maximizing (owner controlled) firms and growth (and other goals) maximizing (management controlled) firms. But aided by a careful selection of samples which held almost every element constant except a change in management Shelton reached the conclusion that owner controlled firms are more profitable because their supervision and operation are more thorough, i.e., they utilize every input to a nearly maximum possible extent and reduce waste because their supervisory (owner-manager) interest is so closely connected with that of the firm. Supervision by non-owner managers, on the other hand, tends to be more general and less thorough and to leave part of various inputs not fully utilized.

We do not, however, have enough information to examine how far the differences in profitability and growth performances of our firms is

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(1) Apart from Leibenstein's own empirical study, see J.P. Shelton 'Allocative Efficiency vs. "X-efficiency": Comment', American Economic Review, Vol. 57 (Dec. 1967) pp.1252-8, and Monsen, Chiu and Cooley, op.cit.

(2) Shelton, op.cit.

caused by differences in the supervisory quality of the management.[1] No doubt there are differences in quality of supervisory services between different management to varying degrees. There are gaps between maximal opportunity possibilities and the opportunities which are actually pursued and exploited by management through increase in profit and expansion of firms. The extent of these gaps are determined by the aims, incentives and ambitions of management which, in part, reflect the competitive pressures which the managerial personnel perceive within and between industries. Here the study of market structures is essential. In Chapter III we observed that there was a leading firm in each industry

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(1) Among our 146 continuous firms, information concerning the types of control is readily available for 71 firms including 17 of our '19 fastest-growing firms' (see Chapter IV). The table below indicates differences in these firms' profit and growth performance.

Type of control	17 'fastest-growing' firms	54 'Middle and Slowest-growing' firms		
		No. of firms	Annual Average Profit Rate (%)	Annual Average Growth Rate (%)
Overseas company control				
i) Majority control[1]	5	7	8.0	8.3
ii) Minority control[2]	4	9	6.8	11.6
Australian company control[3]	1	4	9.0	12.6
Majority control[4]	1	2	6.9	13.0
Minority control[5]	2	16	7.9	12.1
Management control[6]	4	16	7.9	11.5
Total	17	54	7.8	11.5

Notes: (1) Overseas firm owns over 50 per cent of the voting shares.
(2) Limited number of overseas firms own between 15 and 50 per cent of the voting shares.
(3) Limited number of Australian firms own over 50 per cent of the voting shares.
(4) Limited number of individuals own over 50 per cent of the voting shares.
(5) Limited number of individuals own between 15 and 50 per cent of the voting shares.
(6) No single shareholder owns more than five per cent of the voting shares.

Source: Miskelly, and Wheelwright, Anatomy of Australian Manufacturing Industry, op.cit.

which continuously made the highest profit over certain periods.(1) We also noted that the duration of the high-profit period of a successful firm appeared to shorten as concentration ratios decline. For example, successful firms in 'high-oligopolistic' industries often maintain their leadership over the whole 18 years studied. Leaders in 'unconcentrated' industries, on the other hand, seldom maintained the highest profit rate in their industries for longer than five years and several firms took turns to enjoy the leadership over the 18 years' period. The difference between 'good' and 'bad' management is revealed in sustained high and low profitability in both concentrated and less concentrated industries. But the important fact is that, because of usually relatively greater inter-company competition, firms in less concentrated industries are able to maintain their advantages derived from good management for only a short period. This is because less successful firms, if they wish to survive, must speedily reorganize in order to cope with the situation. On the other hand with milder inter-company competition and high entry barriers protecting them from new competition badly managed firms in oligopolistic industries often survive for longer periods. This was indicated in our study of deficit firms in Chapter IV. We observed there that most of the deficit firms had continuously made trade losses over a number of years and, at the same time, failed to grow fast.(2) Because of such poor business records the majority of deficit firms found themselves unable to continue operating as independent concerns and eventually accepted take-over offers. In oligopolistic industries, however, firms experiencing trade losses and slow growth found it easier to continue independent operations. In all there are 25 deficit firms with relatively low rates of growth (annual average growth rate less than 5 per cent) in high- and moderate-oligopolistic industries (concentration groups 2 and 3), yet only 8 of them ceased to operate as independent concerns. This contrasts with the cessation of operations of 36 out of 67 deficit and slow-growing firms in less

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(1) See Chapter III, Section IV above.

(2) See p.107 above.

concentrated industries. It is important to note that the discontinued oligopolistic firms are concentrated in the manufacture of cotton textiles. Where foreign competition was relatively high[1] and in tobacco and cigars, confectionary, automobiles and ice cream where, despite high concentration ratios, inter-firm competition was relatively strong because of the considerable changes in their market structures.[2] 'Bad' management thus appears to survive more easily in industries where inter-company competition is relatively mild.

At any one time a firm has a given amount of personnel serving managerial functions. Some of them are required for ordinary operations, which were described as 'supervisory' functions above, and the rest are needed to plan and execute the firm's expansion programmes. The latter was referred to as the 'decision-making' function. Now, let us take extreme economic circumstances where a firm is completely free from any disturbing factors and no changes occur internally or externally. Its growth involves merely producing more at the same unit costs with the same techniques and selling them at the same price in the same market. In this case the decision making tasks of management will be negligible and consist simply of conducting the firm along its monotonous growth path.[3] This is obviously a purely hypothetical case, but its temporary introduction assists us in clarifying both the decision making functions of management itself and the criteria by which we can measure the efficiency or quality of this function.

The decision making services of management are only really called

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(1) See for example, Tariff Board Reports 'Cotton Piece Goods, Sheeting, etc.' in Commonwealth Parliamentary Papers, Vol. VI, 1958, pp.1279-301 and Vol.III, 1961, pp.539-66.

(2) See Table 2.4 on p.28.

(3) A similar idea is seen in Kaldor's 'full long-period equilibrium' which he connects with Marshall's stationary state. Kaldor, op.cit., see pp.45-6.

for when adjustments are required in the firm's policy and strategy.(1) Difficulties arise when the adjustments make it necessary for management to acquire new skills or knowledge in order to pursue adequate decision making. In Section I above we demonstrated that firms are capable of expanding managerial services without increasing unit costs. However, managerial services in providing for smooth adjustments in response to various changes imposed on the firm cannot be procured simply by more progressive subdivisions and decentralization of management. For in this case we are faced with the problem of the growth of management at a given time-period, and not with cost comparisons between management in different sized firms. Management must equip itself with the required new knowledge and adjust itself to the new environment. Some managements learn and adjust quickly, some slowly, and some never. This is where we detect the quality differences of the 'decision-making' services of management.(2)

There are two kinds of changes which demand adjustments in managerial policy, operation and behavior. One is external changes which influence to varying degrees all the firms in an industry or an economy. The other kind of changes are internal to a firm. They are self-generated changes which arise at the particular stage(s) of growth.

The possible external changes are many. They include changes in demand for particular products; appearance of new substitute products; changes in technology; discoveries of new materials; opportunities for obtaining better market positions; increase in competition caused by entry

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(1) In the following we expand and develop an idea first put forward by Chamberlin who sought the causes of increasing importance of the decision making services of management in the increased difficulties arising from the greater complexity of the producing unit as the size of a firm grows. E.H. Chamberlin, The Theory of Monopolistic Competition, (Cambridge, Mass.: Harvard Univ. Press, 1958) seventh ed. p.247.

(2) The importance for a firm's sustained growth of management flexibility in adapting to new problems is also stressed by T. Burns, and C. F. Carter and B.R. Williams. T. Burns, Management in the Electronics Industry, Social Sciences Research Centre (Univ. of Edinburgh Press, 1958) and C.F. Carter and B.R. Williams, Science in Industry, Policy for Progress (Oxford Univ. Press, 1959), see Chapter 8 in particular.

of new producers into particular markets on removal of a government import replacement policy; other changes in tariff policy and increased or decreased difficulties in obtaining material, labour and capital etc. All these changes call for adjustments in firms' policies and strategies in order to take advantage of, or to protect against, their effects. The adjustment may take various forms such as backward or forward integration, diversification of products, building up of market shares and mergers.

Internal changes arise when a firm wishes to expand its size. The adjustment problems of small, medium and large size firms are not the same. For instance when a firm is small it is likely to produce a single good or a set of closely related goods and to sell them in a local market. Its business is usually conducted by an owner-manager. When it grows to medium size the need to diversify its operations may arise and hence it must enter the national market. Its need for larger amounts of capital may force an owner-manager to give up control. Its production scale may be by then large enough to justify the employment of new capital intensive techniques. For further expansion into the large size class, it must decentralize its managerial functions, and a further diversification of its activities is required including perhaps investment in other firms. In addition sales drives may be undertaken in particular markets, and the further introduction of new technology may require expansion into overseas markets.

Such changes in business activities and internal organization which arise with increase in size require the acquisition of certain new skills by management. The management of a small firm, for example, must acquire knowledge concerning the national market. The management of a medium size firm must in turn acquire knowledge of overseas markets. Obstacles to growth arise when a firm's management does not have the requisite capacity for the planning, execution and efficient operation of the growth programmes, and is not competent enough to acquire the necessary knowledge within a relatively short period. The required adjustments are most pronounced and cause serious difficulties when firms try to grow from

medium to large size. We called this particular stage in the expansion process of a firm the 'critical point' in Chapter IV.[1] At a 'critical point' a firm encounters the necessity of simultaneous changes in its production, financial and marketing processes. The management in its 'decision-making' capacity is required to cope with the transition by allocating the firm's resources, introducing new techniques and re-orienting its planning so as to move the firm into the larger size category. The difficulties which management encounters at the 'critical point' are so large that, as we observed in Chapter IV,[2] a number of firms fail to continue operating as independent concerns and are forced to merge with other firms. A 'good' management is, on the other hand, able to navigate its firm through the 'critical points', and to sustain its growth.

Apart from this high 'mortality' rate of medium size firms, the difficulties which management experiences at the critical point(s) are also revealed in the particularly wide differences in profitability and growth observed between medium size firms as compared with other firms. First, we noted that the proportion of deficit firms was relatively high in the medium size groups.[3] Second, growth variability (measured by standard deviation around the mean growth rate) was also found to be the highest in firms of these size groups.[4] This is also demonstrated in Diagrams 5.2-5.4 on p.130 above. The 18-year annual average growth rates of medium size firms vary from roughly -2.0 per cent to 41 per cent (Diagram 5.3). As compared with this, the growth rates of the majority of small and large size firms ranged between 1 per cent and 20 per cent (Diagram 5.2), and 5 per cent and 25 per cent (Diagram 5.4) respectively. Third, we also observed that there was a considerable difference in growth rates between 'diversified' and 'single-trade' firms within the medium-sized

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(1) See pp.108-13.

(2) See Section IV in Chapter IV.

(3) See Table 3.6 on p.59 above.

(4) See p.93 above.

groups (see Table 5.4).[1] Diversified medium-sized firms grew at 18.3 per cent per annum as compared with 11.0 per cent for 'single-trade' firms of the same size category. The differences are much smaller for firms of other size groups. We noted also that when firms grow from the 'small' to the 'medium-size' category some of them began expanding into new markets. Although diversification into new areas involves risks - at least initially - and requires new knowledge and techniques, if it is successfully undertaken firms are likely to sustain faster growth without depressing their earning power.[2] On the other hand firms which confine themselves to one market are eventually likely to depress either rates of growth or their rates of profit. In the process of expansion through critical points numbers of important decisions must be made concerning various aspects of firms' business activities, and the correctness of choice will consequently be revealed in the varying rates of profit and growth. The differences in business results between successful and unsuccessful firms are wide, reflecting the importance and complexities of 'decisions' taken by firms passing through a 'critical point'.

We noted above that the 'decision-making' functions of management are concerned with creating, searching for, and establishing production processes and making optimum input decision, i.e., selecting production possibility loci. The nature, extent and area of managerial functions largely differ with the size of firms. For instance, usually if a firm is small, management's tasks lie largely in selecting and promoting the most profitable opportunities under a given set of investment possibilities. On the other hand if a firm is large, usually management's functions extend further towards cultivating and creating the possible directions of profitable expansion. We have seen that diversification into closely related industries is generally possible only for firms of medium and large size, while expansion into fields which are not closely related is

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(1) See p.~~150~~ 147 above.

(2) See pp.143-8

normally almost prohibitive for any other than large-medium size firms (with 1967 net capital assets greater than £1,600,000).(1)

Our argument may be well demonstrated also in the following manner. Students of industrial organization discuss various likely behavior patterns of monopolists and oligopolists. They ask whether monopolists maximize profit or sales; whether oligopolists are likely to conduct non-price competition and to employ full-cost principles; what makes price-leadership continuously operate. Their approach is based on the market controlling power which large size (relative to market) is expected to provide monopolists and oligopolists, and their inter-firm reactions. None of these problems enter the 'decision-making' sphere of management of small firms. Atomistic firms in Marshall's world are not concerned with either market control devices or rival firm reactions.

The important point is that the production possibility loci expand as the firm grows in size. In other words, large firms have more economic means to pursue their goals than have smaller ones. Consequently managerial motivation, characteristics and ability change with the increase in size of firms. N. Kaldor defines the firm as 'a productive combination possessing a given unit of co-ordinating (managerial) ability'(2) and he suggests that a firm whose managerial ability changes, while preserving its legal identity, should just as well be treated as two separate firms.(3)

We cannot accept Kaldor's view. On the contrary our prime concern is the very changes in co-ordinating ability within a firm which arise from its growth processes. We seek the explanation of the growth behavior of a firm in such changes in the co-ordinating ability and characteristics of the firm.

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(1) See Table 5.3 on p.144.

(2) Kaldor, op.cit., p.44.

(3) Ibid.

The expansion of production possibility loci with the increase in the size of firms is seen in various ways. To name just a few, we have noted that large firms are mostly monopolists and oligopolists and often at the same time monopsonists and oligopsonists.(1) Their large shares of the markets in which they buy and sell bring them certain controlling power over changes in the market conditions. The various market-imposed constraints on firms decline with increase in size and large firms consequently are able to invest in lines where risk and demand fluctuations are too high for small firms. We also noted that large firms are able to finance a greater part of their investment from accumulated internal sources.(2) Their investment decisions are not normally restricted to any considerable extent by availability of capital funds, thus they are able to take up every available profitable opportunity with relatively small risk.(3) Large firms are able to maintain research laboratories which assist management to keep up with technological developments and to introduce new products. This minimizes risks and uncertainties arising from the sudden appearance of new competing products. Thus we can see with regard to investment programmes that large firms have all of the options of small firms, and in addition they can invest in lines requiring capital of a scale and involving risks of a nature which exclude the participation of small firms. Further, small firms are restricted not only in their investment opportunities, but also in their choices of maximizing goals to a considerable extent. In Chapter V we observed that the relationship between profitability and growth of firms differs considerably between individual firms, and between firms of different sizes. Generally speaking, the relationship between these two variables, profitability and growth rates, is found to be closer in small firms than in larger ones.(4)

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(1) See p.37 above.

(2) See Section III in Chapter V above.

(3) Ibid.

(4) Ibid.

Concerning the observed phenomena, we suggested that a large part of business behavior of small firms appears to be better explained by the profit maximization hypothesis rather than the growth maximization hypothesis. This is mainly because small firms usually rely on retained profit to finance their growth and also they are mostly single-product firms engaged in only one market. Since their expansion very much depends on demand prospects of one particular market they are not usually able successfully to pursue growth maximizing goals per se. As firms grow larger they diversify their activities and they have easier access to finance. Consequently the constraints imposed by particular markets on firms will be greatly reduced and the choice of goals - maximization of profit, or growth, or something else - is widened. One firm may choose to exploit its opportunities by fast growth and a moderate profit rate, while another firm may exploit its opportunities by moderate growth and a high profit rate. The choice depends on the views and attitudes of management, but we found that most of the large firms appear to pursue growth maximization. The reasons for the preference of growth to profit by large firms can be found in our argument presented above. Firms grow in order to expand the investment opportunities which they can take up.(1)

Several economists such as Monsen and Downs, and O.E. Williamson argue that inefficiency in pursuing the firm's goals develops as its size increases. This is because the 'control loss' and the inefficiency of the managerial bureaucracy are expected to become more serious as the firm gets larger.(2) They appear to suggest, therefore, that large firms do not achieve their growth potential. Penrose reaches a similar conclusion suggesting that the rate of growth of firms will eventually decline with

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(1) Management's growth motivations are connected by Galbraith with 'planning' extensively employed in modern corporations, and the various reasons leading modern firms to grow may be found in Galbraith, The New Industrial State, op.cit.

(2) Monsen and Downs, op.cit., and O.E. Williamson, 'Hierarchial Control and Optimum Firm Size', Journal of Political Economy, Vol.75, (April 1967), pp.123-38.

increasing size mainly because i) the expansion of large firms involves expansion into several new fields and the consequent complexity increases the managerial burden, ii) large size will make it more difficult to work out a flexible administrative structure, and iii) if a firm wants to grow through acquisition it will find that there are fewer and fewer large firms available at a given time and it will have to acquire a progressively larger number of small firms to keep up the high rate of growth.(1)

As against this we argue that the extent and magnitude of a firm's growth difficulties do not have any general systematic association with size. There is a limit to the rate at which any firm can grow. It is the limit imposed by the capacity of the management - its ability to adapt to new situations deviating from the familiar. When a firm grows the external and internal changes described above (pp.170-2) always require management to alter currently employed production, financial and distribution methods so as to best serve the firm in its obtained large size. In order to combat the problems arising from changing business situations part of a firm's available managerial resources will be used to gather information, digest it, analyse it, and reach conclusions about the policies and strategies to be undertaken. This creates tasks for the existing management personnel which, given the pressure of the time factor involved, may exceed their capacity in terms both of volume and difficulty. If so, the firm must either entirely forego any further growth or suffer a temporary retardation of its expansion until its managerial capacity has improved. The speed and the growth path of a firm largely depends on the skill and competence of its management, and above all its individual choice of alternative means to exploit profit and expansion opportunities.

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(1) Penrose, op.cit., see in particular Chapter IX.

APPENDIX A : ECONOMIC BACKGROUND OF AUSTRALIA, 1950-1967

In order to depict the role and significance of our 402 firms it is necessary to obtain a broad view of the structure and the institutional characteristics of the Australian economy.

A. Structure of the economy[1]

In 1954 about 3.7 million people were engaged in the production and distribution of the Australian National Product. In the period between 1954 and 1966, with population growing at 2.8 per cent per annum the work force expanded by 1.2 million to 4.9 million. The manufacturing sector absorbed a quarter of the increase and its work force rose from 1.0 million to 1.3 million. The annual rate of increase of the real Gross National Product was about 4.5 per cent. Although the proportion of the work force engaged in manufacturing industry has not changed since 1954, a large part of the increase in real Gross National Product was contributed by the manufacturing sector through its rising productivity.

Within the manufacturing sector the distribution of employment and production changed considerably. A rapid expansion was seen in industries such as industrial metals, paper making, chemicals and food processing, while established industries such as clothing, skins and leather and saw mills, etc. experienced relative stagnation. A rough idea of structural changes over the period may be obtained from Appendix Tables A.1 and A.2 below.

B. Government economic policy

The economic policy of all post war Federal governments has been focused generally on the four main objectives - i) Full employment, ii) Stability of prices, iii) Equilibrium in the balance of payments, and iv) Development and industrialization of the economy.[2]

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(1) For further details see the articles included in H.W. Arndt and W.M. Corden (eds.) The Australian Economy, A volume of readings (Melbourne: F.W. Cheshire, 1963), and P.H. Karmel and M. Brunt, The Structure of the Australian Economy (Melbourne: F.W. Cheshire, 1963) revised edition, pp.125-141.

(2) Official Year Book of the Commonwealth of Australia, 1950-1969.

Appendix Table A.1

Census Figures of Work-force by Industries

	30 June 1947		30 June 1954		30 June 1961		30 June 1966	
	Nos Employed (000)	Percentage of Total Work-force (%)	Nos Employed (000)	Percentage of Total Work-force (%)	Nos Employed (000)	Percentage of Total Work-force (%)	Nos Employed (000)	Percentage of Total Work-force (%)
Manufacturing	918	28.7	1,027	27.7	1,140	27.0	1,312	27.0
Primary production	506	15.8	498	13.3	459	10.9	457	9.4
Mining and quarrying	58	1.8	61	1.6	54	1.3	56	1.2
Utilities and construction	266	8.3	399	10.8	467	11.1	535	11.0
Transport and communication	323	10.1	336	9.1	363	8.6	382	7.9
Finance and commerce	517	16.2	672	18.2	828	19.6	966	19.9
Public authority and community and business services	367	11.5	451	12.2	580	13.7	757	15.6
Others	241	7.5	263	7.1	334	7.9	391	8.1
Total in work-force	3,196	(100.0)	3,702	(100.0)	4,225	(100.0)	4,856	(100.0)
Not in work-force	4,383		5,285		6,283		6,694	
Grand Total	7,579		8,987		10,508		11,551	

Source: Official Year Book of the Commonwealth of Australia, 1950, 1967 and 1969.

Appendix Table A.2

Employment in Manufacturing Industry[1] and Index of Factory Production

	Numbers Employed				Percentage increase between 1949-50 and 1966-67	
	1949-50 (000)	1955-56 (000)	1961-62 (000)	1966-67 (000)	Employment (%)	Factory production (constant prices) (%)
Treatment of non-metal, mine, etc. products	16.6	20.9	23.2	26.1	2.4	251.4
Bricks, etc.	19.2	22.9	24.1	27.0	2.0	106.3
Chemicals, etc.	34.5	44.7	46.8	54.6	5.1	398.1
Industrial metals, etc.	344.3	444.3	497.0	611.6	68.2	241.4
Textiles, etc.	65.5	68.4	67.9	73.0	1.9	119.5
Skins, leather, etc.	16.3	18.8	12.0	11.4	-1.3	-7.0
Clothing, etc.	118.8	110.8	104.7	111.9	-1.8	65.4
Food, drink, etc.	122.8	126.5	128.6	143.5	5.3	78.6
Sawmills, etc.	53.2	61.9	57.3	60.0	1.7	71.3
Furniture, etc.	21.0	21.5	21.4	24.4	.9	116.3
Paper, stationery, etc.	53.0	62.7	73.8	89.2	9.2	211.6
Rubber	12.4	17.3	17.2	20.2	2.0	169.4
Precious metals, etc. / Musical instruments / Miscellaneous products	26.7	28.6	30.6	40.2	3.4	350.0
Sub Total	904.3	1044.3	1104.6	1293.1	99.3	178.3
Heat, light and power	13.2	16.2	16.1	16.1	.7	240.6
Grand Total	917.5	1060.5	1120.7	1309.2	100.0	180.1

Note: (1) Based on whole year employment including working proprietors.

Source: Commonwealth Bureau of Census and Statistics, Manufacturing Industry.

In Australia the politically acceptable level of unemployment is considered to be not higher than three per cent. In fact the economy has continuously enjoyed full employment in almost its literal sense except for brief periods in 1953, 1961-2, and 1966-7.

It is, however, true that full employment policies have often fostered inflationary trends in the economy and have endangered the fulfilment of the second and the third goals. From time to time various fiscal and monetary devices have been employed to secure some compromise between the four objectives.

In order to mitigate the balance of payment problems in the expansionary climate of the post-war economy, direct import restrictions were long the favoured instrument. They were employed from late 1951 to early 1960, although the extent of the restrictions varied from time to time. No sooner were the restrictions lifted than imports increased considerably and the government was forced to impose deflationary measures and to give priority to the goals of the price stability and balance of payments equilibrium. Since 1963 the federal government, aided by the mining boom, has been fairly successful in attaining all of its objectives.

Various measures have been employed by the government to encourage the development and industrialization of the economy. They include important assisted migration schemes, large scale development programmes such as the Snowy Mountain hydro-electric and the Ord River irrigation schemes, and the provision of assistance to import replacement in the private sector. With the removal of the direct import restrictions, tariff protection has been extensively used to promote industrialization of the economy. The basic principle behind the tariff measures is to assist local industries to replace imports, but strong arguments have recently been put forward that in a number of cases at least protection has been afforded to inefficient producers at the expense of consumers and primary producers. The magnitude

and the extent of Australian protection policy may be depicted roughly by the following statistics. In 1966-67 in value terms about 40 per cent of total imports were dutiable. More than half of the remaining imports consisted of goods the demand for which could not be fully met by domestic producers.(1) The effective protection rates differ considerably between industries and countries of origin and usually range from 10 per cent to over 100 per cent ad valorem. Thus it is difficult to measure average tariff rates, but according to W.M. Corden's calculation they appeared to be something over 30 per cent in 1959-60.(2)

Foreign investment in Australia has been encouraged by this protection policy. Numbers of overseas firms, mainly British and American, have established subsidiaries in Australia behind the tariff wall in preference to paying high duties on imports. The general expansion of the Australian market and the federal and state governments' encouragement of overseas investors has also contributed to the inflow of foreign capital from private overseas companies which amounted on average to between £A.30 and £A.50 million in the first half of the 1950s and increased to £A.50 and £A.70 million in the second half of the decade. Since 1960 the figure has often exceeded £A.150 million.(3) As a result about a quarter of net company income was earned by overseas controlled companies in the mid 1960s.(4)

Considerable import replacement in manufacturing industries occurred in the post-war period, particularly in the fields of material supply such as the production of iron and steel and other metals, in paper-making and food processing, and to a lesser extent in the field of

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(1) There are still numbers of manufacturing fields where domestic production capacity has not kept up with the growth of Australia's demand and others where no domestic industries have yet been established. In these areas imports are permitted without duty under the 'by-law' system. For a further discussion of tariff protection policy in Australia, see W.M. Corden, 'The Tariff' in A. Hunter (ed.) The Economics of Australian Industry: Studies in Environment and Structure, (Melbourne University Press, 1963), pp.174-214.

(2) Ibid.

(3) Official Year Book of the Commonwealth of Australia, op.cit. 1950-1969, and Commonwealth of Australia, Report of the Committee of Economic Enquiry, (May 1965) Vol.II Appendices J-L.

(4) Ibid.

consumer goods manufacturing. But the dependence on imports for the supply of capital equipment is still large. This is to be expected because import replacement itself and the initial industrial development of an economy usually involve the importation of much capital equipment.

On the export side, Australia still depends on primary products for most of its export income with wool still maintaining the dominant position despite the growing importance of minerals. Manufacturing goods represented only about 10 per cent of total export earnings in 1963-64, but its proportional contribution is rapidly growing pari passu with the increasing tempo of the economy's industrialization.(1)

Australia has long been regarded, particularly overseas, as a primary producer. But the image may soon change. Manufacturing sectors are playing a vital part in the growth of the economy helped by governments eager to further industrialization. Hence the field of our study, the corporate sector, is expected to rapidly increase in importance.

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(1) Report of the Committee of Economic Enquiry, Ibid, Vol.II Appendix J.

APPENDIX B : PERIOD

Our study concerns the period extending over 18 financial years from 1949/50 to 1966/67. The period was chosen because 1949/50 was the first year for which company accounting data are available for a relatively comprehensive number of public companies while 1966/67 was the latest year for which the required information was available at the commencement of our study.

Since companies are allowed to choose their own accounting dates their accounting years vary, although most of them choose the 12 months ending either 30 June or 31 December. In preparing the data we classified the accounting years of each company according to which financial year its accounting date fell - e.g., data concerning a firm's accounting year ending 31 December 1955 is placed in the financial year 1 July 1955 - 30 June 1956. Hence all accounts dated between 1 July 1949 and 30 June 1967 are included in our study.

The whole 18 year period is divided into three sub-periods for the convenience of our analysis. They are:

sub-period 1, 1950-55 extending from 1 July 1949 to 30 June 1955.
sub-period 2, 1956-61 extending from 1 July 1955 to 30 June 1961.
sub-period 3, 1962-67 extending from 1 July 1961 to 30 June 1967.

APPENDIX C : INDUSTRIES

Depending on the purpose of the analysis the 402 selected companies which we studied are grouped into two separate industrial categories. The classification of the firms into '51' industrial groups is based on the primary product of each firm while the second category, 'concentration groups', is based on the market structure in which the firms operate.

1. '51' industries

The following 51 industries (Appendix Table C.1) are obtained from our '109' industries listed in Table 2.1 in Chapter II. Thirty nine of the original 109 industries are omitted for reasons given on p.8 above. Forty remain in their original form. The remaining 30 of the original 109 industries are re-grouped into 11 larger industrial groups for the reasons given on pp.8-9 above. These 11 new groupings are noted with alphabetical suffixes in Appendix Table C.1 and their relations with the original '109' industries are given in the footnote attached to the table. In all, our '51' industries include 70 of the '109' original industries and represent 52 per cent of manufacturing industry employment in 1962 (excluding 'heat, light and power').

Since the number of listed companies operating in any one of the '51' industries is generally small the '51' industries are occasionally grouped into '8 major industrial groups' in each of which several technically related industries are aggregated.

2. Concentration groups

In Appendix Table C.2 the '51' industries are classified into seven different concentration groups the basis of which is given in Table 2.2 (column 2) on p.15.

APPENDIX TABLE C.1

'8 Major Industrial Groups' & '51' Industries and Number of Firms Included : 1950 - 67

8 Major Industrial Groups	No. of Companies (Total)	Industry Code No.	'51' Industries	No. of Companies
1. Cement, etc.	28	49	Asbestos cement sheets and moulding	1
		4	Bricks, tiles, etc.	5
		3	Concrete, concrete products, etc.	10
		2	Portland cement (a)	11
		5	Sheet glass and glass bottles	1
2. Chemicals	43	10	Chemical fertilizers (b)	9
		6	Industrial chemicals	13
		8	Paints	5
		11	Petroleum refining	2
		7	Pharmaceuticals	3
		45	Rubber products	9
		9	Soaps, detergents, etc.	2
3. Iron and Steel, etc.	75	13	Aluminium, leadm zinc, etc. refining and smelting (c)	3
		17	Automobile parts	12
		20	Cranes and hoists etc.	6
		18	Farm machinery (d)	14
		15	Hand tools, pumps cutleries	6
		19	Heavy machines	12
		14	Iron foundries and castings, metal works	17
		12	Iron and steel manufacturing	1
		16	Motor vehicles.	4
4. Electrical Engineering.	35	21	Electrical appliances (e)	21
		22	Electrical machines (f)	14
5. Textiles, clothing and footwear.	97	47	Bags and sacks	1
		25	carpets	2
		27	Clothing (g)	29
		24	Cotton textiles (h)	15
		30	Footwear - leather (i)	5
		26	Knitting and hosieries (j)	15
		29	Leather tanning etc.	6
		28	Wool scouring etc.	2
		23	Wool textiles. (k)	22
6. Sawmills etc.	35	31	Builders, hardwares, etc.	8
		53	Fibreboard	1
		52	Furniture making	4
		43	Paper making	5
		50	Plastic products	1
		48	Plywoods	5
		44	Saw mills	10
		32	Wooden containers	1
7. Food, tobacco and breweries.	73	34	Bakeries	4
		38	Biscuits, etc.	11
		33	Breweries	10
		35	Flour milling	9
		39	Ice-cream, butter, etc.	9
		40	Jam, fruit and vegetable preserving, etc.	14
		41	Other food	8
		37	Sugar refineries	1
		36	Tobacco, etc.	5
		51	Vegetable oils	1
8. Newspapers.	16	42	Newspapers and periodicals	16

APPENDIX TABLE C.1.

(Continued)

NOTES:
(a) Sheet glass; glass bottles.
(b) Industrial chemicals; and Alkalis.
(c) Aluminium; lead; tin; and zinc refining and smelting.
(d) Hand tools; pumps; and cutlery and flatware.
(e) Television receivers; radio receivers; Domestic refrigerators; Domestic washing machines; and Domestic electric appliances.
(f) Electric switch and control gear; electric motors; and valves.
(g) Mens' and boys' ready-made outer clothing and womens' outer garments etc.
(h) Cotton spinning; and cotton weaving.
(i) Footwear; and travel goods; handbags, etc.
(j) Knitted underwear; knitted outerwear; and hosiery.
(k) Wool wearing and wool dyeing and finishing.

APPENDIX TABLE C.2

Concentration Groups : 1950 - 67

Concentration Groups.	No. of Companies.	Industry Code No.	'51' Industries.	No. of Companies.
1. Monopolistic and Oligopolistic industries.	16	13	Aluminium, lead, zinc etc. refining and smelting	3
		33	Breweries	10
		12	Iron and steel Mfg's.	1
		5	Sheet glass and glass containers	1
		37	Sugar refineries	1
2. High-Oligopolistic industries	66	49	Asbestos, cement sheets and moulding	1
		38	Biscuits, etc.	11
		25	Carpets	2
		24	Cotton textiles	15
		39	Ice-cream, butter, etc.	9
		16	Motor vehicles	4
		43	Paper making	5
		11	Petroleum refining	2
		45	Rubber products	9
		9	Soaps, detergents, etc.	2
		36	Tobacco, etc.	5
		51	Vegetable oils.	1
3. Moderate - Oligopolistic industries	77	31	Builder's hardwares, etc.	8
		10	Chemical fertilizers.	9
		3	Concrete, concrete products etc.	10
		18	Farm machinery	14
		29	Leather tanning etc.	6
		42	Newspapers and periodicals	16
		7	Pharmaceuticals	3
		2	Portland cement	1
4. Low - Oligopolistic industries.	81	47	Bags and sacks	1
		21	Electrical appliances	21
		22	Electrical machines	14
		15	Hand tools, pumps, cutleries	6
		19	Heavy machines.	12
		6	Industrial chemicals	13
		40	Jam, fruit and vegetable preserving etc.	14
5. Unconcentrated industries.	92	17	Automobile parts	12
		4	Bricks, tiles etc.	5
		20	Cranes and hoists, etc.	6
		53	Fibreboard	1
		35	Flour milling	9
		26	Knitting and hosieries	15
		41	Other food	9
		8	Paints.	5
		50	Plastic products.	1
		48	Plywoods	5
		28	Wool scouring, etc.	2
		23	Wool textiles.	22
6. Competitive Industries.	23	30	Footwear - leather	5
		14	Iron foundries and castings, metal works	17
		32	Wooden containers.	1
7. High - competitive industries.	47	34	Bakeries	4
		27	Clothing	29
		52	Furniture making	4
		44	Saw mills	10

APPENDIX D : FIRMS

The subjects of our study are public companies listed in the Sydney Stock Exchange between 1950 and 1967 whose major activities lie in the '51' industries listed in Appendix Table C.1. We aimed to classify listed firms into industries which engage more than 50 per cent of their total employed capital. Those firms whose activities are so widely diversified that no single market dominates their activity in this fashion were excluded. This left us with 402 companies. The industrial classification of the firms is based on information obtained mainly from their annual company reports, Department of National Development, The Structure and Capacity of Australian Manufacturing Industry, 1952 and Department of Trade and Industry, Developments in Australian Manufacturing Industry, 1956-7 to 1966-7. Many firms operate in several industries. Information concerning the products of firms is extremely incomplete in Australia and on several occasions we were forced to use somewhat arbitrary decisions based on common sense and on general knowledge of the firms.

The 402 firms are also classified into four different categories according to the length of time for which they operated as independent concerns. For the basis of this classification see p.9 above.

The names of the 402 firms and the size of their net capital assets in their initial and closing years are set out in Appendix Tables D.1 - D.4 below. Appendix Table D.5 lists the size groups referred to in the study.

APPENDIX TABLE D.1

146 'Continous' Firms : 1950-67.

Industry Code No. (a)	Name of Companies.	Opening (b) Size(1950) (£'000)	Closing (c) Size(1967) (£'000)
2	Adelaide Cement Holdings, Ltd.,	387	4325
42	Advertiser Newspapers, Ltd.,	1296	11397
38	Allen's Confectionery, Ltd.,	346	2334
35	Allied Mills, Ltd.,	834 (1951)	16395
21	Amalgamated Wireless (Aust.,) Ltd.	2307	11072
11	Ampol Petroleum, Ltd.,	2278	74183
29	Associated Leathers, Ltd.,	1262	3731
42	Associated Newspapers, Ltd.,	3683	4400
43	Associated Pulp and Paper Mills,Ltd	4875	20738
23	Astor Consolidated Mills, Ltd.,	268 (1952)	224
5	Australian Consolidated Industries, Ltd.,	11752	70970
24	Australian Cotton Manufacturing Co., Ltd.,	106 (1952)	157
14	Australian National Industries,Ltd	1881	5871
43	Australian Paper Manufacturers, Ltd.,	8469	63767
23	Ballarat Woollen and Worsted Co	248	380
26	Beau Monde (Aust.,), Ltd.,	264	761
27	Berlei United, Ltd.,	1125	3448
14	Bliss Welded Products, Ltd.,	204	1472
3	Blue Metal Industries, Ltd.,	475	21128
24	Bond's Industries, Ltd.,	1369	7408
11	Boral, Ltd.,	2554 (1954)	38759
17	Borg-Warner (Aust), Ltd.,	735	7403(1966)
24	Bradford Cotton Mills, Ltd.,	4232	12262
14	Bradford Kendall, Ltd.,	436 (1951)	2943
4	Brisbane and Wundlerich (H.L.)Ltd.,	289 (1951)	2165
36	British Tobacco Co., (Aust). Ltd.,	18456	63905
12	Broken Hill, Pty, Ltd., The	32178	389265
24	Caesar Fabrics, Ltd.,	545	937
33	Carlton and United Breweries,Ltd.	16228 (1955)	48681
25	Carpet Manufacturers, Ltd.,	430	2867
33	Cascade Brewery Co. Ltd., The	832 (1951)	2640
33	Castlemaine Perkins, Ltd.,	2228	10139
43	Cellulose Australia, Ltd.,	474	3522
16	Chrysler Australia, Ltd.,	795	32809
19	Clyde Industries, Ltd.,	1509	16968
37	Colonial Sugar Refining Co. Ltd.	27456	114933
3	Concrete Industries (Monier).Ltd.	357	13323
42	Consolidated Press Holdings, Ltd.	1452	13419
10	Courtaulds (Aust), Ltd.,	1445	9160
10	Cresco Fertilizers, Ltd.,	985	3776
27	Crystal Clothing Industries,Ltd.	424	827
44	C. T. L. Holdings, Ltd., (Formerly Cairns Timber Ltd.,)	93	161
24	Davies, Coop and Co., Ltd.,	1365	11109
31	Davies (R.B.) Industries, Ltd.,	464	1961
8	Davison Paints, Ltd.,	86	481
44	Duncan's Moldings, Ltd.,	358	1117
45	Dunlop Australia, Ltd.,	7318	44364
22	Electrical Equipment of Aust.,	177	2444
21	Electronic Industries, Ltd.,	1069	18803
22	Email, Ltd.,	3919	16623
13	E Z Industries, Ltd.,	5090	24773

APPENDIX TABLE D.1
(continued)

Industry Code No.(a)	Name of Companies.	Opening Size (1950)(b) (£'000)		Closing Size (1967)(c) (£'000)
23	F and T Industries (Aust).Ltd. (Formerly Felt and Textiles of Australia, Ltd.,)	9882		29917
7	Faulding (F.H.) and Co., Ltd.,	1021		2214
23	Federal Woollen Mills, Ltd.,	838		744
27	Formfit of Australia, Ltd.,	135		503
40	Fowlers Vacola Manufacturing Co.,	326	(1952)	442
19	Freighters Industries, Ltd.,	338		m2754
16	General Motors Holdens, Pty,Ltd.	6368		99277
27	Gentex, Ltd.,	29		308
2	Goliath Cement Holdings, Ltd.,	509		4267
45	Goodyear Tyre and Rubber Co.,	4472		24210
34	Hackshall's, Ltd.,	385		1928
14	Hadfields (W.A.) 1934 Ltd.,	91		648
48	Hancock and Gore, Ltd.,	315		1716
21	Healing (A.G), Ltd.	1411		10549
42	Herald and Weekly Times Ltd. The	3706		19901
26	Hilton Corporation, Ltd.,	340		3512
26	Holeproof Industries, Ltd.,	1174		3004
18	Horwood, Bagshaw, Ltd.,	366		3125
6	Imperial Chemical Industries of Australia and New Zealand, Ltd.,	11622		139552
21	International Products, Ltd.,	305		1695
27	Jantzen (Australia), Ltd.,	289		541
22	John (M.B) and Hattersley, Ltd.,	269		5681
22	Johns and Waygood Holdings, Ltd.,	679		6450
29	Johnson Leather Co., Ltd.,	1284		3121
40	Jones (Henry) (IXL) Ltd.,	5007		16971
35	Katanning Flour Mills, Ltd.,	221	(1953)	231
21	Kelvinator Australia, Ltd.,	1008		4498
27	Leroy Manufacturing Co. Ltd.,	167		323
27	Leviatham, Ltd., The	440	(1952)	1306
38	Life Savers (Australia),Ltd.,	195		3595
33	Lion Brewing and Malting Co. Ltd.	140		616
27	London Stores, Ltd.,	593		1770
23	Macquarie Worsteds, Ltd.,	435		978
21	Malleys, Ltd.,	736		6705
29	Mangrovite Industries, Ltd.,	198		344
26	Maryborough Knitting Mills (Cuttle)	382		768
23	Mascot Underwear Mills, Ltd.,	89	(1951)	116
52	Mathias and Co., Ltd.,	15		63
42	Mirror Newspapers, Ltd.,	1773		4385
20	Moore (Malcolm) Industries Ltd.,	448		2450
50	Moulded Producta (Aust), Ltd.,	681		8619
15	Mytton's, Ltd.,	327		3721
6	Nally, Ltd.,	64		676
38	Nestlé Co., (Aust), Ltd., The	3524		11754
42	News, Ltd.,	282		14608
6	Nightingale Supply, Co., Ltd.,	137	(1953)	754
2	North Australian Cement, Ltd.,	113	(1951)	1153
23	Onkaparinga Woollen Co., Ltd.,	348		1593

APPENDIX TABLE D.1
(Continued)

Industry Code No. (a)	Name of Companies.	Opening Size (1950) (b) (£'000)	Closing Size (1967) (c) (£'000)
27	Pelaco, Ltd.,	730	1479
39	Peters Ice Cream (W.A), Ltd.,	440	3620
39	Petersville, Australia, Ltd.,	461	16323
41	Piper (Tom), Ltd.,	179	2726
18	Pizzey, Ltd., (Formerly Geo. Pizzey and Son, Ltd.)	870	2932
26	Prestige, Ltd.,	1473	8723
2	Queensland Cement and Lime Co.,	903	8526
23	Queensland Woollen Manufacturing Co.	75	187
44	Reid Bros. Holdings, Ltd.	79	446
17	Repco, Ltd.,	1810	28324
24	Rocklea Spinning Mills, Ltd.,	157	69
27	Rothwells Outfitting, Ltd.,	0	587
45	S.A. Rubber Holdings, Ltd.,	167	7299
42	Shipping Newspapers, Ltd.,	231 (1952)	1412
42	Shipping Newspapers (S.A.), Ltd.,	24	91
42	Shipping Newspapers (VIC), Ltd.,	96 (1953)	229
15	Siddons Industries, Ltd.,	205	2577
21	Simpson Pope Holdings, Ltd.,	521	8594
28	Smith (Henry B.) Ltd.,	563	784
33	South Australian Brewing Co. Ltd.	1188	9234
2	South Australian Portland Cement.	308 (1965)	2445
38	Stedman (James), Ltd.,	785	3533
24	Stirling Henry, Ltd.,	426	589
24	Supertex Industries, Ltd.,	499	1035
26	Sutex Industries, Ltd.,	561	1561
33	Swan Brewery, Co. Ltd.,	2989	10192
2	Swan Portland Cement, Ltd.,	260	1079
42	Syme (David) and Co., Ltd.,	1039	5818
43	Tasmanian Board Mills, Ltd.,	631	1283
8	Taubmans Industries, Ltd.,	2033	6272
35	Thomas (W.) and Co., (W.A.) Ltd.	855 (1953)	2258
14	Thompsons (Castlemaine), Ltd.,	697	2500
33	Tooheys, Ltd.,	3544	12868
33	Tooth and Co., Ltd.,	8361	30380
19	Tulloch, Ltd.	501	1675
31	Turner Industries, Ltd.,	227 (1951)	2050
23	Tweedside Manufacturing Co. Ltd.,	154 (1951)	273 (1966)
6	Union Carbide Australia, Ltd.,	510	8966
23	Valley Worsted Mills, Ltd.,	733	1687
23	Wangaratta Woollen Mills, Ltd.,	287	1268
21	Warburton Franki, Ltd.,	334	2128
27	Wardrop (George), Ltd.,	222	528
42	West Australian Newspapers, Ltd.,	922 (1951)	4494
23	Western Australian Worsted and Woollen Mills, Ltd.,	430	272
41	White Crow, Ltd.,	122	335
23	Woolcord Fabrics, Ltd.,	113	183
23	Yarra falls, Ltd.,	2439	5161

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Notes;
(a) See Appendix Table C.1. Above.
(b) Where 1950 figures are not available the base year used is indicated in the brackets.
(c) Where 1967 figures are not available the end year is indicated in the brackets.

APPENDIX TABLE D.2

68 'Discontinued' Firms.

Last Operating Year	Industry Code No.(a)	Name of Companies.	Opening Size (1950)(b) (£'000)	Closing Size(c) (£'000)
1951	4	Commonwealth Ceramics, Ltd.,	227	227(1950)
	27	Murdoch's, Ltd.,	958	958(1950)
1953	27	Coo-ee Clothing, Ltd.,	193	360
	45	Olympic Tyre and Rubber Co.,	1562	4564
1954	24	Hollins Mill of Aust., Ltd.,	309	9
	18	K. L. Tractors, Ltd.,	141	157(1953)
	16	Lawton (J.A.) and Sons, Ltd.	241	515 (1953)
	23	Riverhart, Ltd.,	135	331
1955	26	Australian Knitting Mills,.	758	959 (1954)
	22	Brose Valves , Ltd.,	83	127 (1954)
	13	Euston Lead Co., (Aust).Ltd.	354	405 (1954)
	18	Howard Auto-Cultivators, Ltd.	431	699 (1954)
1956	22	Electric Control and Engineering Ltd.,	217 (1951)	616
	45	General Rubber Co., Ltd.,	223 (1952)	342(1955)
	14	Hadfields Steel Works, Ltd.	218	373(1955)
	38	McNiven (R.J.) Industries.Ltd.	211 (1951)	177(1955)
	40	Starkeys, Ltd.,	40 (1951)	42(1955)
	24	Sydney Cotton Mills, Ltd.,	150	169 (1955)
	8	Tip Top Paints (Aust),Ltd.	128	317
1957	24	Burlington Mills (Aust),PL.	1301	1586
	21	President Consolidated, Ltd.,	98 (1951)	792(1956)
	48	Proofwood, Ltd.,	113	135
	26	Yoffa Hosiery and Knitting Mills, Ltd.,	132	152
1958	36	Carreras, Ltd.,	756	1343(1957)
	10	Geartin - O'Riordan, Ltd.,	177	463
	14	Mortson and Bearby, Ltd.,	319	564(1957)
	18	Trojan, Ltd.,	104 (1951)	145
1959	41	Kraft Holdings, Ltd.,	2213 (1952)	6902
	26	Lustre Hosiery, Ltd.,	740	914(1957)
	53	Masonite Holdings, Ltd.,	548	3838(1958)
	19	Mort's Dock and Engineering Co., Ltd.,	1567	1800(1958)
	41	Trufood of Australia, Ltd.,	260	466(1958)
1960	15	C.C. Engineering Industries.	311	965(1959)
	19	Goodwin (A.E.). Ltd.,	411	4045
	14	Industrial Steels, Ltd.,	391 (1951)	558(1958)
	4	Kande Kitchenware, Pty, Ltd.,	170 (1952)	207 (1959)
	39	Pauls, Ltd.,	887 (1951)	1465(1959)
	30	Perry (H) and Co., Ltd. ,	114 (1952)	118(1959)
	39	Peters - Arctic Delicacy, Co.	309	849(1959)
	19	Poole and steel, Ltd.,	107 (1951)	152(1959)
	2	Standard Portland Cement.Co.	593	1403(1959)
	39	Streets Ice Cream, Ltd.,	681 (1952)	1432(1959)
1961	27	California Productions, Ltd.	173 (1952)	26(1960)
	10	Commonwealth Fertilisers and Chemicals, Ltd.,	2223	4445(1960)
	23	Lincoln Mills (Aust), Ltd.,	953	1736(1960)
	33	Queensland Brewers, Ltd.,	1635	4336(1960)
1962	19	British Standard Machinery.	401	958
	41	Edgell (Gordon) and Sons.	610	3109(1961)
	20	Hodkinson (W.A.) and Co.	116 (1952)	403(1961)
	40	Rosella Preserving and Mfg.Co.	1162	3008

APPENDIX TABLE D.2
(Continued)

Last Operating Year	Industry Code No.(a)	Name of Companies	Opening Size(1950)(b) (£'000)	Closing Size(c) (£'000)
1963	24	Australian Silk Knit, Ltd.,	357	398(1962)
	21	Ducon Industries Ltd. (Formerly Ducon Condensers.)	225	3235
	14	Gonian (A) and Co., Ltd.,	389	2042
1964	18	Baltic Simplex Machinery.Co.	251	629(1963)
	26	Bruce Pie Industries, Ltd.,	460	842(1963)
	27	La Mode Holdings, Ltd.,	637	714(1963)
	3	Ready Mixed Concrete, Ltd.,	305	21452(1963)
	34	Swallow and Ariell, Ltd.,	671	1171(1963)
1965	6	Bauxite Investments, Ltd.,	321 (1951)	801 (1964)
	35	Love (Clifford) and Co. Ltd.	485	1626(1964)
	17	Sonnerdale Richardson David Brown, Ltd.,	378	1460
	10	Wallaroo - Mount Lyell Fertilisers, Ltd.,	454	943
1966	17	Perry Engineering, Co.Ltd.	328	2828(1965)
	6	Sulphates, Ltd.,	319 (1951)	552(1965)
1967	23	Castlemaine Woollen Co.	239	190(1966)
	24	Dickie (H.B.), Ltd.,	456	1221(1966)
	8	Glazebrooks Paint and Chemicals	421	671(1966)
	38	Hoadley's Holdings, Ltd.,	257	1539(1966)

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NOTES:
(a) See Appendix Table C.1. Above.
(b) Where Opening sizes are not available the base year used is indicated in the bracket.
(c) Where closing sizes are not available the end year is indicated in the brackets.

APPENDIX TABLE D.3

45 'Short-Lived' Firms.

First Operating Year.	Industry Code No.[a]	Name of Companies.	Opening Size (b) (£'000)	Closing Size (Closing Year) (£'000)
1950	32	Hansen Consolidated Industries Ltd.,	252(1951)	426(1957)
	21	Jorgensen Brothers Ltd.	55(1951)	104(1954)
1951	17	Automotive Compnents Ltd.	647(1952)	3029(1964)
	29	Bayley (J) and Sons.Ltd.	532(1952)	2010(1966)
	21	Burley Industries Ltd.	210(1952)	225(1958)
	27	Consolidated Clothing.	104(1954)	69(1958)
	19	Cullen Brothers Ltd.	118(1952)	219(1958)
	10	Lanes Holdings Ltd.,	246(1954)	786(1960)
	38	Menz (W) and Co.Ltd.	243(1952)	430(1962)
	40	Passiona Bottling Co. (Sydney) Ltd.	102(1953)	126(1958)
	18	Peterson (W.A.) Ltd.	384(1957)	-618(1968)
	3	Reliance Industries Australia Ltd.	56(1954)	168(1959)
	23	Vicars (John) and Co.Ltd.	2275(1952)	3441(1964)
1952	40	Cottees Ltd.	358(1953)	2815(1966)
	28	Newcastle Wool Processing Co. Ltd.	190	183(1953)
1953	10	Adelaide Chemical and Fertilisers Co. Ltd. The	756	2184(1965)
	18	Harvey (Daniel) Holdings Ltd.	275(1954)	275(1958)
	18	Mobile Industrial Equipment,Ltd.	170(1958)	1195(1966)
	6	Petroleum and Chemical Corporation (Aust.) Ltd.	1749(1955)	2575(1959)
	26	Rosslyn Hosiery Holdings Ltd.	254(1955)	214(1961)
1954	14	Richardson Holding Ltd.	237(1955)	323(1963)
1955	22	A.E.I. Ltd.	5216	5084(1962)
	31	Agco Ltd.	205	329(1956)
	23	Australian Woollen Mills Ltd.	2921	3558(1964)
	31	Donson Products Ltd.	196(1956)	270(1959)
	22	Ellis and Clark Holdings Ltd.	136(1956)	210(1959)
	2	Gippsland Cement,Ltd.	533(1957)	1204(1966)
	33	Grafton Brewing Co.Ltd.	981(1956)	748(1959)
	20	Hasemer Crane and Engineering Ltd.	315(1956)	382(1963)
	43	Paper and Board Industries Ltd.	302(1956)	1106(1961)
1956	22	Australian Electric Co. Ltd.	96(1958)	148(1962)
	21	Titan Television Ltd.	86	122(1957)
1958	52	Fler Co. Ltd.	184(1960)	397(1965)
	35	Love (N.B.) Industries Ltd.	1443(1960)	1886(1961)
	6	Olims Industries Ltd.	151(1959)	557(1960)
1959	3	Bayview Ltd.	1135	3750(1965)
	3	Concrete Enterprises Holding Ltd.	455(1960)	455(1960)

APPENDIX TABLE D.3

(Continued)

First Operating Year	Industry Code No.(a)	Name of Companies	Opening Size (b) (£'000)	Closing Size (Closing Year) (£'000)
1959	20	Cranvel Holdings Ltd.	203(1960)	213(1965)
	40	Ecks Holdings Ltd.	160(1961)	160(1961)
	45	Rubbertex Industries Ltd.	529(1960)	461(1962)
	31	Watson and Crane Holdings Ltd.	421(1960)	480 (1963)
1960	40	Marchant and Co. Ltd.	178(1961)	674(1964)
	38	Smalls Chocolate Holdings Ltd.	685(1961)	685(1961)
1962	45	Merco Holdings Ltd.	176(1963)	232(1965)
1963	6	Intrade Chemicals Holdings Ltd.	219(1964)	202(1965)

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NOTE: (a) See Appendix Table C.1. Above.
(b) Where Opening sizes are not availabe the base year is indicated in the brackets.

APPENDIX TABLE D.4

143 'Newly-entered' Firms.

First Operating Year.	Industry Code No.(a)	Name of Companies	Opening Size (b) (£'000)	Closing Size(1967)(c) (£'000)
1950	38	Big Sister Foods Ltd.	372(1951)	1087
	21	Braemar Industries Ltd.	244(1951)	1839
	35	Charlick (William) Ltd.	618(1956)	1860
	13	Consolidated Metal Products Ltd.	660(1956)	5421
	21	Draffin Everhot Ltd.	132(1952)	724
	30	Ford Sherington Holdings Ltd.	306(1952)	821
	48	Hearn Industries Ltd.	167(1951)	713
	17	Henderson's Industries Ltd.	675(1952)	3015
	19	Industrial Engineering Ltd.	571(1951)	8791
	22	International Resistance Holdings Ltd.	384(1951)	5235
	19	Jaques Brothers Ltd.	437(1951)	1453
	38	MacRobertson (Aust) Ltd.	3994(1951)	6211
	27	Marco Productions Ltd.	280(1951)	425
	17	McKay (Ralph) Ltd.	177(1951)	2227
	2	Newcastle Lime and Cement Co. Ltd.	59(1951)	361
	27	Nile Textiles Ltd.	518(1952)	1111
	27	Palmer (F.J.) Holdings Ltd.,	776(1952)	1737(1966)
	36	Phillips (Godfrey) Holdings Ltd.	1974(1952)	4628
	42	Publishers Holdings Ltd.	220(1952)	1773
	48	Symonds (Ralph) Ltd.	285(1951)	1704
1951	8	Brolite Industries Ltd.	489(1952)	1486
	27	Casben Productions Ltd.	623(1952)	232
	31	Dickson Primer (Consolidated) Ltd.	367	2927
	35	Fielder (Geo.) and Co.	313(1952)	3449
	49	Hardie (James) Asbestos Ltd.	2786(1952)	16581
	30	International Footwear Industries Ltd.,	148(1953)	1053
	14	Kerr (F.G.) and Co. Ltd.	89(1952)	149
	51	Marrickville Holdings Ltd.,	2567(1956)	10598
	22	Rowe (H) and Co. (Aust.) Ltd.	671	1920
	27	Sackville (John) and Sons Ltd.,	426(1952)	1902
	26	Speedo Holdings Ltd.	211(1952)	1292
	44	Timber Holdings Ltd.	207(1952)	2464
	44	Timber Holdings (Tasmania) Ltd.	231(1952)	578
	14	Tomlinson Steel Ltd.	426(1952)	1176
1952	16	Australian Motor Industries Ltd.	2796(1953)	4913
	44	Bunning Timber Holdings Ltd.	1216(1956)	2837
	9	Campbell Brothers Ltd.	150(1955)	475

APPENDIX TABLE D.4

(Continued)

First Operating Year	Industry Code No.(a)	Name of Companies	Opening Size(b) (£'000)	Closing Size (1967)(c) (£'000)
1952	19	Conquip Ltd.	146(1955)	638
	25	Minster Ltd.	614(1953)	4601
	14	Napier Brothers Ltd.	133(1956)	577
	27	Rundles Holdings Ltd.	173(1956)	284
	44	Softwood Holdings Ltd.	426(1953)	3080
1953	20	Flexdrive Industries Ltd.	169(1954)	993
	19	Marfleet and Weight Ltd.	212(1954)	1174
	45	Olympic Consolidated Industries Ltd.	9082(1956)	26204
	21	Stanger and Co.Ltd.	202(1957	414
	39	Toppa Holdings Ltd.	419(1954)	1843(1966)
1954	6	Australian Chemical Holdings Ltd.	1315(1955)	8994
	14	Bundeng Ltd.	191(1954)	696
	47	Gadsden (J) Australia Ltd.	2832(1955)	11794
	39	Model Dairy Industries Ltd.	421(1955)	2923
	21	Newton McLaren Investments Ltd.	263(1955)	799
	31	N.K.S. Holdings Ltd.	2081(1955)	4451
1955	17	Bennett and Wood Ltd.	1673(1956)	2035
	42	Davies Brothers Ltd.	653(1956)	1579
	41	Davis Gelatine Consolidated Ltd.	3648(1956)	5794
	21	Frigrite Ltd.	129(1956)	1840
	18	Massey - Ferguson Holdings (Aust) Ltd.	8102(1956)	11396
	36	Morria (Philip) (Aust) Ltd.	1597(1956)	5329
	17	Olding Equipment Ltd.	434(1956)	556
	36	Rothmans of Pall Mall (Australia) Ltd.	554(1956)	10050
	14	Sargeants Engineering Ltd.	461(1956)	1839
	44	Wilson, Hart and Co.Ltd.	304(1956)	589
1956	24	Bruck Mills (Aust) Ltd.	2009	3337
	17	Consolidated Auto Parts Co. Ltd.	330	746
	10	Croda Federal Chemicals Ltd.(Formerley Federal Chemicals Holdings Ltd.	147(1957)	307
	42	Fairfax (John) Ltd.	8043(1957)	21044
	22	Federated Industries Ltd	2139(1958)	5112
	42	Queensland Press Ltd.	2759(1957)	7757
	22	Tyree Industries Ltd.	341(1957)	1175
1957	34	Austral Bakeries Holdings Ltd.	470	1924
	23	Cleck Heaton Ltd.	335(1958)	6262
	26	Crest Knit Industries Ltd.	562(1958)	1726
	21	E.M.I. (Aust) Ltd.	2210(1958)	4840
	27	Hiller (Ernest) Holdings Ltd.	239(1958)	603
	40	Monbulk Preserves Ltd.	471(1958)	630
	7	Plaimar Ltd.	322(1960)	916
	7	United Australian Industries Ltd.	115(1958)	760

APPENDIX TABLE D.4

(Continued)

First Operating Year	Industry Code No.(a)	Name of Companies	Opening Size(b) (£'000)	Closing Size (1967)(c) (£'000)
1958	40	Cohn Brothers Ltd.	533(1959)	1506
	35	Gillespie Brothers Holdings Ltd.	1261(1960)	4561
	41	Harvest Foods Ltd.	627(1960)	801
	40	Tarax Drinks Holdings Ltd.	679(1960)	2345
1959	27	Bisley Clothing Ltd.	145(1960)	370
	52	Clarke Brothers Holdings Ltd.	167(1960)	874
	4	Eureka Terra Cotta and Tile Co. of Australia Ltd.	258(1961)	295
	26	Osti Holdings Ltd.	501(1960)	1594
	6	Petrochemical Holdings Ltd.	3496(1961)	3421
	3	Pioneer Concrete Services Ltd.	2958(1961)	13022
	18	Shearer (John) and Sons (Holdings) Ltd.	1254(1960)	1956
1960	34	Adams (Herbert) Holdings Ltd.	950(1961)	2617
	3	Australian Gypsum Industries Ltd.	3618	6096
	3	Consolidated Quarries Ltd.	663(1962)	2811
	27	Country Club Holdings Ltd.	287(1962)	333
	52	Don Industries Ltd.	429(1962)	529
	6	Gibson Kelite Industries Ltd.	645(1962)	1403
	21	Hecla Australia Ltd.	578(1962)	1187
	27	Hestia Co. Ltd. The	175(1961)	470
	6	Jordon Chemicals Ltd.	166(1961)	570
	3	Norbloc Ltd.	158(1961)	211
	41	Pioneer Sugar Mills Ltd.	5032(1961)	8977
	24	Prasby Insudtries Ltd.	117(1961)	147
	39	Queensland United Foods Ltd.	2710(1961)	5585
	29	Yates (Herbert) Holdings Ltd.	807(1961)	528
1961	10	Amalgamated Chemicals Ltd.	2456	3964(1966)
	35	Barnes Milling Ltd.	669(1962)	974
	18	Bowra Holdings Ltd.	124(1963)	501
	4	Evans Brothers Holdings Ltd.	558(1963)	835
	40	Hall (Geo.) and Sons Ltd.	487(1963)	424
	44	Harris Holdings Ltd.	392(1962)	574
	15	Luke (K.C.) Group Industries Ltd.	2477(1962)	3716
	14	Lysaght (John) Australia Ltd.	27520(1962)	35115
	31	Nairn (Michael) and Co. Australia Ltd.	1930	2021
	45	North Australian Rubber Mills Ltd.	563(1962)	624
	48	S. A. Plywood Holdings Ltd.	407(1963)	515
	40	Schweppes (Aust) Ltd.	4295(1962)	4504
	9	Simalex Ltd.	1016(1963)	952
	21	Vulcan Industries Ltd.	634(1963)	1500
1962	44	Atel Ltd.	219	175
	22	Camelec Ltd.	374	1057
	18	Chamberlain Holdings Ltd.	3134(1963)	4260
	30	Clarks Shoes Australia Ltd.	716	2763
	26	Kolotex Holdings Ltd.	249(1963)	775

APPENDIX TABLE D.4

(Continued)

First Operating Year	Industry Code No.(a)	Name of Companies	Opening Size(b) (£'000)	Closing Size (1967)(c) (£'000)
1962	40	Shelleys Drinks Ltd.	661(1964)	1163
	27	Stafford - Ellinson Consolidated Ltd.	418(1964)	446
	41	Weston (George) Foods Ltd.	18633(1963)	20367
1963	18	Connor Shea Holdings Ltd.	631(1964)	1292
	30	Marlow (Julius) HOLDINGS Ltd.	903(1964)	1117
	15	Sher Tools Australia Ltd.	599(1964)	706(1966)
	17	Wibroc Industries Ltd.	271(1965)	368(1966)
1964	2	Associated Portland Cement Manufacturers Australia Ltd.	10110	14823
	2	Australian and Kandos Cement Holdings Ltd.	14314	16596
	20	Davleco Industries Ltd	434(1966)	414
	17	Dawson (A.J.) Ltd.	330	391
	29	Dixon (Donald) Industries Ltd.	357(1965)	401
	27	Hilton Brothers Holdings Ltd.	430(1965)	545
	14	Huckson Industries Ltd.	332(1965)	346
	42	Northern Star Holdings Ltd.	627(1966)	670
	15	Nuttall Holdings Ltd.	461(1966)	487
1965	23	Adelaide and Wallaroo Fertilizers Ltd.	3708(1966)	4847
	27	Squires (Anthony) Holdings Ltd.	756	1234
	23	Textile Holdings Ltd	6115(1966)	5836
	39	Whippy(Mr.) Holdings Ltd.	1723(1966)	105
1966	38	Lea (Darrell) Chocolates Ltd.	479(1967)	479

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NOTES.

(a) See Appendix Table C.1. Above.
(b) Where opening sizes are not available the base year is indicated in the brackets.
(c) Where closing sizes are not available the end year is indicated in the brackets.

Appendix Table D.5

Net Assets Size Classification

Size Groups	Net Assets (£'000)
1	0-49
2	50-99
3	100-199
4	200-399
5	400-799
6	800-1,599
7	1,600-3,199
8	3,200-6,399
9	6,400-12,799
10	12,800-25,599
11	25,600-51,199
12	51,200-102,399
13	102,400 and over

APPENDIX E : ACCOUNTING DATA

The following balance-sheet items are used in the thesis. They are consolidated figures and expressed in terms of £A.

Liabilities

'Capital': includes all types of shares issued (cumulative, participating, etc.). It includes issues to employees, the proceeds of share issues still awaiting allotment at the accounting date, and issues made to acquire other companies.

'Reserves': includes all types of reserves - capital, revenue and contingency provisions - but excludes revaluation and depreciation reserves (in case gross fixed assets are presented in balance-sheets).

'Depreciation provision' is the current provision and is taken from the profit and loss account.

'Current liabilities': include unsecured bank overdrafts for terms of less than 12 months, trade creditors, bills payable, accrued liabilities for wages, interest, rates etc., loans maturing within 12 months, provision for taxation, dividends payable, and deferred revenue.

Assets

'Total employed capital': includes net fixed assets (after depreciation), stocks, debtors, securities, inter-company accounts, intangible assets, and other assets such as sinking funds of various types.

'Fixed assets': include land, buildings, plant and machinery. In cases where gross fixed assets are presented on balance sheets, depreciation reserves have been deducted to give the net figure.

The following profit and loss account items are used in the study. They are also consolidated figures expressed in terms of £A.

'Net profit' is operating profit less taxation (tax paid), depreciation provision, interest payments, directors' fees and interest of outside shareholders. It includes income from investments.

'Tax paid': Where tax paid on current year's income is not published tax provision on current year's income is used.

'Dividends paid': includes dividends on ordinary shares and on all types of preference shares.

'Interest paid' is interest payments presented in profit and loss accounts.

The sizes of our 402 firms are measured by 'net capital assets' which are the value of total employed capital minus current liabilities.

Appendix Table F.1

Average Growth Rates of Net Assets by Opening Size of Net Assets : 1950-1967
146 Continuous Firms

Industrial group 1 Cement, etc. Size-group		1950-67			1950-55			1956-61			1962-67		
		No of Companies	Average Growth Rates %	Standard Deviation %	No of Companies	Average Growth Rates %	Standard Deviation %	No of Companies	Average Growth Rates %	Standard Deviation %	No of Companies	Average Growth Rates %	Standard Deviation %
1	0-49	0	..	..	0	..	..	0	..	..	0	..	..
2	50-99	0	..	..	0	..	..	0	..	..	0	..	..
3	100-199	1	15.6	..	1	58.0	..	0	..	..	0	..	..
4	200-399	5	15.2	5.4	5	22.0	11.2	0	..	..	0	..	..
5	400-799	2	19.2	8.3	2	21.8	8.9	3	13.1	13.3	0	..	..
6	800-1599	1	14.1	..	1	11.2	..	5	22.3	24.0	3	5.6	1.32
7	1600-3199	0	..	..	0	..	..	1	24.6	..	3	13.6	.52
8	3200-6399	0	..	..	0	..	..	0	..	..	1	20.3	..
9	6400-12799	1	11.2	..	1	9.1	..	0	..	..	1	24.9	..
10	12800-25599	0	..	..	0	..	..	1	10.0	..	1	-1.2	..
11	25600-51199	0	..	..	0	..	..	0	..	..	1	9.9	..
12	51200-102399	0	..	..	0	..	..	0	..	..	0	..	..
13	102400 and over	0	..	..	0	..	..	0	..	..	0	..	..
	Total	10	15.1		10	24.4		10	17.5		10	12.2	

		1950-67			1950-55			1956-61			1962-67	
Industrial group 2												
Chemicals												
1	0-49	0	..	..	0	..	..	0	..	..	0	..	..
2	50-99	2	12.8	3.0	2	24.6	10.2	0	..	..	0	..	..
3	100-199	2	18.9	8.4	2	26.8	3.0	0	..	..	0	..	..
4	200-399	0	..	..	0	..	..	3	10.4	5.0	0	..	..
5	400-799	1	18.4	..	1	23.2	..	1	25.9	..	3	4.4	5.0
6	800-1599	3	8.1	3.4	3	23.8	17.5	3	15.3	19.7	1	20.5	..
7	1600-3199	3	17.6	9.3	3	28.9	11.5	0	..	..	2	12.1	15.3
8	3200-6399	1	10.4	..	1	10.9	..	2	11.6	14.6	1	1.1	..
9	6400-12799	2	13.5	3.2	2	15.6	2.4	2	4.5	3.6	3	7.7	7.6
10	12800-25599	0	..	..	0	..	..	2	15.4	14.5	2	16.8	.5
11	25600-51199	0	..	..	0	..	..	1	17.1	..	1	10.3	..
12	51200-102399	0	..	..	0	..	..	0	..	..	1	14.8	..
13	102400 and over	0	..	..	0	..	..	0	..	..	0	..	..
	Total	14	14.2		14	22.0		14	14.3		14	11.0	
Industrial group 3												
Iron and steel, etc.												
1	0-49	0	..	..	0	..	..	0	..	..	0	..	..
2	50-99	1	12.2	..	1	14.2	..	0	..	..	0	..	..
3	100-199	0	..	..	0	..	..	1	18.2	..	0	..	..
4	200-399	5	14.1	1.6	5	26.0	10.1	1	24.4	..	0	..	..
5	400-799	6	13.1	6.4	6	22.1	12.9	1	28.0	..	2	11.1	5.3
6	800-1599	2	11.4	5.6	2	18.0	6.9	7	12.2	10.9	2	13.3	3.3
7	1600-3199	2	12.2	7.5	2	22.2	.8	2	3.6	8.0	7	4.2	5.4
8	3200-6399	2	13.6	5.5	2	23.2	17.9	4	11.4	14.1	3	23.0	21.2
9	6400-12799	0	..	..	0	..	..	1	29.9	..	0	..	..
10	12800-25599	0	..	..	0	..	..	0	..	..	3	5.9	5.7
11	25600-51199	1	15.8	..	1	5.8	..	1	17.5	..	0	..	..
12	51200-102399	0	..	..	0	..	..	1	28.7	..	1	7.9	..
13	102400 and over	0	..	..	0	..	..	0	..	..	1	6.7	..
	Total	19	13.2		19	18.8		19	19.3		19	10.3	

		1950-67			1950-55			1956-61			1962-67		
Industrial group 4 Electrical eng.													
1	0-49	0	..	..	0	..	..	0	..	..	0	..	..
2	50-99	0	..	..	0	..	..	0	..	..	0	..	..
3	100-199	1	16.7	..	1	25.1	..	0	..	..	0	..	..
4	200-399	3	13.9	5.0	3	19.0	7.5	0	..	..	0	..	..
5	400-799	3	15.3	2.3	3	21.9	9.0	2	19.9	1.8	0	..	..
6	800-1599	3	13.4	4.6	3	20.1	10.1	3	17.7	7.2	2	6.3	4.4
7	1600-3199	1	9.7	..	1	4.0	..	3	12.9	7.3	3	7.7	5.1
8	3200-6399	1	8.9	..	1	16.2	..	3	23.5	12.0	3	6.1	5.0
9	6400-12799	0	..	..	0	..	..	1	4.2	..	2	-.2	4.0
10	12800-25599	0	..	..	0	..	..	0	..	..	2	3.1	.2
11	25600-51199	0	..	..	0	..	..	0	..	..	0	..	..
12	51200-102399	0	..	..	0	..	..	0	..	..	0	..	..
13	102400 and over	0	..	..	0	..	..	0	..	..	0	..	..
	Total	12	13.0		12	17.7		12	15.6		12	4.6	
Industrial group 5 Textiles, etc.													
1	0-49	1	14.9	..	1	33.1	..	0	..	..	0	..	..
2	50-99	2	3.6	2.7	2	6.7	11.5	1	3.1	..	0	..	..
3	100-199	7	2.9	3.8	7	14.1	17.4	5	9.1	8.1	4	-4.7	9.6
4	200-399	9	6.0	4.6	9	14.3	6.9	7	5.5	5.7	7	1.5	6.1
5	400-799	13	4.5	3.3	13	8.9	14.1	11	7.1	6.5	9	-3.5	7.8
6	800-1599	8	7.3	4.3	8	13.7	10.4	9	6.3	6.8	9	3.0	9.5
7	1600-3199	1	4.5	..	1	9.5	..	6	4.8	4.2	6	-2.7	8.7
8	3200-6399	1	6.5	..	1	7.9	..	4	8.9	6.8	6	3.8	9.6
9	6400-12799	1	6.7	..	1	6.1	..	0	..	..	2	-.4	1.4
10	12800-25599	0	..	..	0	..	..	1	9.6	..	1	3.3	..
11	25600-51199	0	..	..	0	..	..	0	..	..	0	..	..
12	51200-102399	0	..	..	0	..	..	0	..	..	0	..	..
13	102400 and over	0	..	..	0	..	..	0	..	..	0	..	..
	Total	43(1)	6.3		43(1)	12.7		44	6.8		44	.04	

	1950-67			1950-55			1956-61			1962-67		
Industrial group 6												
Saw mills												
1 0-49	1	8.8	..	1	34.1	..	0	..	..	0	..	..
2 50-99	2	7.0	5.3	2	10.2	3.6	1	1.4	..	1	2.0	..
3 100-199	0	..	..	0	..	..	2	6.0	6.0	1	3.0	..
4 200-399	3	10.7	3.9	3	15.7	2.7	0	..	..	1	6.3	..
5 400-799	3	8.5	4.1	3	12.0	4.8	2	22.4	16.6	0	..	..
6 800-1599	0	..	..	0	..	..	4	12.3	10.6	3	1.3	4.1
7 1600-3199	0	..	..	0	..	..	0	..	..	3	-1.5	6.3
8 3200-6399	1	8.9	..	1	18.8	..	0	..	..	0	..	..
9 6400-12799	1	12.6	..	1	24.6	..	1	8.1	..	0	..	..
10 12800-25599	0	..	..	0	..	..	0	..	..	1	1.7	..
11 25600-51199	0	..	..	0	..	..	1	6.9	..	1	8.4	..
12 51200-102399	0	..	..	0	..	..	0	..	..	0	..	..
13 102400 and over	0	..	..	0	..	..	0	..	..	0	..	..
Total	11	9.4		11	19.2		11	9.5		11	3.0	
Industrial group 7												
Food, etc.												
1 0-49	0	..	..	0	..	..	0	..	..	0	..	..
2 50-99	0	..	..	0	..	..	0	..	..	0	..	..
3 100-199	4	12.8	6.2	4	13.8	14.6	1	20.4	..	0	..	..
4 200-399	4	6.0	5.7	4	11.9	14.8	2	5.5	7.8	2	-2.1	.9
5 400-799	3	15.3	7.3	3	12.0	6.1	3	10.3	6.8	1	7.6	..
6 800-1599	4	12.0	6.2	4	11.1	2.4	8	16.4	6.6	1	-15.5	..
7 1600-3199	2	8.4	1.3	2	10.6	6.2	0	..	..	6	6.1	3.7
8 3200-6399	3	7.6	.3	3	9.4	3.2	3	9.2	1.9	2	-3.2	5.5
9 6400-12799	1	7.9	..	1	16.0	..	3	5.7	2.9	8	6.7	4.2
10 12800-25599	2	8.6	1.4	1	6.4	..	2	7.1	1.9	1	4.0	..
11 25600-51199	1	8.8	..	1	8.7	..	2	9.1	5.5	2	7.9	1.8
12 51200-102399	0	..	..	0	..	..	0	..	..	1	6.6	..
13 102400 and over	0	..	..	0	..	..	0	..	..	0	..	..
Total	24	9.7		23(1)	11.1		24	10.5		24	2.0	

		1950-67			1950-55			1956-61			1962-67		
Industrial group 8													
Newspapers, etc.													
1	0-49	1	8.2	..	1	4.6	..	1	18.8	..	0	..	..
2	50-99	1	6.4	..	1	12.3	..	0	..	..	1	2.4	..
3	100-199	0	..	..	0	..	..	1	11.5	..	0	..	..
4	200-399	2	19.5	9.4	2	-5.8	16.3	1	24.4	..	1	.4	..
5	400-799	0	..	..	0	..	..	0	..	..	0	..	..
6	800-1599	4	12.0	2.1	4	16.0	7.3	1	48.7	..	1	5.5	..
7	1600-3199	1	5.5	..	1	4.8	..	4	12.5	6.0	0	..	..
8	3200-6399	2	5.7	6.6	2	8.5	9.6	2	8.0	7.9	5	6.7	6.2
9	6400-12799	0	..	..	0	..	..	1	9.3	..	2	9.7	1.8
10	12800-25599	0	..	..	0	..	..	0	..	..	1	6.6	..
11	25600-51199	0	..	..	0	..	..	0	..	..	0	..	..
12	51200-102399	0	..	..	0	..	..	0	..	..	0	..	..
13	102400 and over	0	..	..	0	..	..	0	..	..	0	..	..
	Total	11	9.6		11	6.7		11	19.0	..	11	5.2	
'All-industries'													
1	0-49	3	10.6	3.7	3	23.9	16.8	1	18.8	..	0	..	..
2	50-99	8	8.2	4.6	8	13.7	9.4	2	2.3	1.2	2	2.2	.2
3	100-199	15	9.4	8.0	15	19.4	17.8	10	10.8	7.5	5	-3.2	9.0
4	200-399	31	10.9	6.3	31	16.4	11.7	14	9.3	8.3	11	1.1	5.2
5	400-799	32	10.2	6.8	32	15.0	12.6	23	12.5	10.0	15	.8	8.6
6	800-1599	25	10.2	4.6	25	15.9	9.6	40	14.6	13.5	22	4.4	8.9
7	1600-3199	10	11.4	7.1	10	17.1	11.8	16	9.3	7.6	30	4.5	7.9
8	3200-6399	11	8.7	3.9	11	13.2	8.9	19	12.4	10.1	21	7.6	11.9
9	6400-12799	6	10.9	3.3	6	14.5	6.5	9	8.6	8.4	19	6.5	6.8
10	12800-25599	2	8.6	1.4	1	6.4	..	6	10.8	7.6	12	6.0	6.0
11	25600-51199	2	12.3	5.0	2	7.2	2.1	5	11.9	5.7	5	8.9	1.4
12	51200-102399	0	..	..	0	0	..	1	28.7	..	3	9.7	4.4
13	102400 and over	0	..	..	0	0	..	0	..	..	1	6.7	..
	Total	145	10.1		144(2)	14.8		146	12.5		146	4.6	

Notes: (1) One firm is not included because its net asset information is not available for 1950.
(2) Two firms are not included because their net asset information is not available for 1950.

Appendix Table F.2

Growth and Acquisitions : 146 Surviving Firms

Growth Rates (%)	(1) Concentration Groups	(2) Industries	(3) Name of Companies	(4) Average Growth Rates (1950-67)	(5) Net Assets (1950) (£'000)	(6) Net Assets (1967) (£'000)	(7) Number of Cos. acquired	(8) Value of acquisition (£'000)	(9) Acquisition as % of change in value (8)/(6)-(5)%
Less than 5.0	5	23	Western A Worsted L	-2.0	430	272	..		
	2	24	Rocklea Spinning Mill L	-1.7	157(b)	69	..		
	5	23	Astor Consli Mills L	- .4	268	224	..		
	5	23	Federal Woollen M L	- .2	838(c)	744	..		
	5	35	Katanning Flour Mills L	.7	221	231	..		
	3	42	Ass Newspap L	1.2	3683(a)	4400	..		
	5	23	Mascot U/wear Mills L	1.8	89	116	..		
	5	28	Henry B Smith L	2.3	563	784	?	?	?
	5	23	Woolcord Fabrics L	3.1	113	183	..		
	2	24	Caesar Fabrics L	3.4	545	937	..		
	7	44	C.T.L. Holdings L	3.7	93	161	..		
	3	29	Mangrovite Ind L	4.0	198(b)	344	..		
	4	40	Fowlers Vacola Mfg. Co L	4.1	326	442	..		
	7	27	Leroy Mfg Co L	4.3	167	323	..		
	5	26	Maryborough Knitting L	4.3	382	768	?	?	?
	7	27	Jantzen (A) L	4.5	289(a)	541(g)	..		
	5	23	Tweedside Mfg Co L	4.7	154	273	..		
	2	24	Supertex Ind L	4.7	499	1035	6	?	?
	4	27	Pelaco L	4.8	730	1479	2	48+	6.4+
5.0 - 9.9	5	23	Yarra Falls L	5.1	2439(b)	5161	1	580	21.3
	4	27	Leviathon L	5.1	440	1306	1	108	12.5
	5	23	Macquarie Worsteds L	5.2	435	978(g)	..		
	4	27	Crystal Clothg L	5.2	424	827	?	?	?
	2	24	Stirling Henry L	5.4	426	589	1	675	414.1

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3	29	Johnson Leather Co L	5.8	1284	3121	2	379+	20.5+
5	23	Ballarat Wl Wsd Co L	5.9	248	380	..		
5	26	Sutex Ind L	5.9	561	1561	1	126	12.6
3	42	Mirror Newspapers L	6.2	1773	4385	..		
5	26	Holeproof Ind L	6.6	1174(a)	3004	..		
3	42	W A Newspaper L	6.6	992	4494	?	?	?
3	7	F.H. Faulding & Co L	6.8	1021	2214	..		
2	24	Bradford Cot Mill L	7.0	4232	12262	1	776	9.7
5	23	F & T Industries L	7.1	9882	29917	5	3298+	16.5+
7	27	George Wardrop L	7.2	222	528	..		
7	27	Berlei (United) L	7.2	1125	3448	..		
5	8	Taubmans Ind L	7.2	2033	6272	2	?	?
2	43	Tas Board Mills L	7.5	631(c)	1283	1	190	29.1
3	42	Shipg N/Pap (Vic) L	7.5	96	229	..		
4	40	Henry Jones (IXL) L	7.6	5007	16971	?	?	?
7	27	London Stores L	7.7	593	1770	..		
2	38	Nestle Co (A) L	7.7	3524	11751	1	?	?
2	36	British Tobacco L	7.8	18456(c)	63905	1	176	0.4
5	35	W Thoms & Co (WA) L	7.8	855	2258	..		
5	26	Beau Monde (A) L	8.1	264	761	..		
6	14	Thompsons (Castle) L	8.1	697	2500	2	401	22.2
5	23	Q/land Wolen Mfg Co L	8.2	75	187	..		
1	33	Tooheys L	8.3	3544(b)	12868	4	380+	4.7+
2	24	Aus Cotton Mfg Co L	8.3	106	157	..		
3	10	Cresco Fertiliz L	8.6	985	3776	..		
7	27	Formfit of Aust L	8.7	135	503	..		
7	44	Duncan/s H L	8.9	358	1117	..		
3	42	Shipg N/Paper (SA) L	8.9	24	91	..		
1	37	C S R Co L	9.1	27456	114933	3	42997	49.2
3	29	Ass. Leather L	9.2	1262	3731	?	?	?
5	41	White Crow L	9.3	122	335	1	?	?
4	22	Email L	9.3	3919	16623	2	?	?
3	31	R B Davies Ind L	9.5	464(a)	1961	3	179	12.0
1	33	Cascade Brewery Co L	9.5	832	2640	2	165	9.1
4	21	Internat Products L	9.5	305	1695	1	90	6.5

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	2	43	Ass Pulp Pap Mil L	9.6	4875	20738	..		
	3	2	Swan Portland Cmt L	9.6	260	1079	1	38	4.6
	1	33	C/tlemaine Perkins L	9.6	2228	10139	..		
	1	33	Lion Brewing L	9.8	140	616	..		
	4	21	Kelvinator A L	9.8	1008	4498	..		
	1	33	Tooth & Co L	9.9	8361	30380	..		
10.0 - 19.9	1	33	Carlton & United L	10.1	16228 (e)	48681	1	2807	8.6
	2	38	James Stedman L	10.3	785	3533	?	?	?
	4	19	Tulloch L	10.3	501	1675	2	146	12.4
	3	18	Pizzey L	10.4	870	2932	2	36+	1.8+
	6	14	Aust National Ind L	10.9	1881	5871	1	52	1.3
	5	23	Onkaparinga Woollen Co L	11.1	348	1593	1	?	?
	2	24	Bond Ind L	11.1	1369	7408	1	?	?
	2	45	Goodyear Tyre L	11.1	4472	24210	..		
	7	44	Reid Bros H L	11.3	79	426	..		
	3	42	Herald & Weekly L	11.4	3706	19901	2	1322	8.2
	1	5	Aus Consol Ind L	11.4	11752	70970	3	7341	12.4
	7	34	Hackshall's L	11.8	385	1928	1	13	0.8
	5	26	Prestige L	11.9	1473	8723	2	3516	21.4
	2	45	Dunlop Aust L	11.9	7318	44364	..		
	5	48	Hancock & Gore L	12.3	315	1716	..		
	4	21	Amal. Wire (A) L	12.4	2307	11072	..		
	3	2	Adel. Cemt. H L	12.9	387	4325	..		
	5	20	Malcolm Moore Ind L	12.9	448	2450	..		
	3	42	David Syme & Co L	13.2	1039	5818	1	?	?
	7	52	Mathias & Co L	13.2	15	63	..		
	6	14	Hadfields (WA) 1934 L	13.2	91	648	..		
	1	33	Swan Brewery Co L	13.2	2989 (a)	10192	3	453	6.3
	6	14	Bradford Kendall L	13.2	436	2943	..		
	5	23	Wangaratta Wolen Mills L	13.4	287	1268	..		
	2	38	Allens Confec L	13.7	346	2334	..		
	2	43	Austn Pap Mfg L	13.7	8469	63767	2	1054	1.9
	4	21	A G Healg L	13.9	1411	10549	1	253	2.8
	2	39	Peters Ice (WA) L	14.0	440	3620	1	806	25.3

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2	43	Cellulose Aust L	14.0	474(b)	3522	..		
3	42	Shipg Newspapers L	14.3	231	1412	2	58	4.9
7	27	Rothwells Outfitting L	14.3	0	587	..		
3	18	Horwood Bagshaw L	14.4	366	3125	2	745	27.0
3	2	Goliath Cmt H L	14.5	509(a)	4267	..		
5	4	H L Brisbane L	14.6	289	2165	..		
3	10	Courtauld (A) L	14.7	1445	9160	..		
4	6	Night/gale Supply Co L	14.9	137 (c)	754	..		
1	33	S A Brewing Co L	14.9	1188	9234	1	?	?
2	24	Davies Coop & Co L	15.0	1365	11109	2	461	4.7
5	26	Hilton Corpor L	15.1	340	3512	1	122	3.8
3	42	Adv Newspap L	15.1	1296	11397	2	1021	10.1
4	21	Malleys L	15.2	736	6705	2	726	12.2
4	22	Johns & Waygood H L	15.3	679	6450	1	434	7.5
7	27	Gentex L	15.4	29	308	1	?	?
3	42	C/solidated Press H L	15.6	1452	13419	2	15850	132.4
4	19	Freighters L	15.8	338	2754	3	387	16.0
1	13	E Z Ind L	15.9	5090	24773	1	457	2.3
4	6	Nally L	15.9	64	676	..		
5	8	Davison Paints L	16.1	86	481	1	15	3.8
4	6	I C I (A & NZ) L	16.2	11622	139552	3	28053	21.9
4	15	Mytton's L	16.3	327	3721(f)	2	525	15.5
3	2	S A Portland Cmt Co L	16.3	308	2445	..		
3	2	Q/land Cement Co L	16.3	903(a)	8526	..		
3	31	Turner Ind L	16.5	227	2050	1	47	2.6
4	19	Clyde Ind L	16.6	1509	16968	6	1724	10.6
5	23	Valley Worsted M L	16.7	733	1687	..		
5	50	Moulded Products (A) L	17.0	681	8619	3	2405	30.3
4	22	Elect Equip of A L	17.2	177	2444	..		
4	15	Siddons Ind L	17.2	205	2577	4	316	13.3
1	12	B H P Co L	17.3	32178	389265	..		
5	17	Repco L	18.7	1810	28324	9	2017	7.6
5	41	Tom Piper L	18.8	179	2726	2	249	9.8
4	21	Electronic Ind L	19.8	1069	18803	5	2471	13.9

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
20.0 and over	4	21	Simpson-Pope H L	20.1	521	8594	2	14400	178.4
	6	14	Bliss Welded Prod L	20.2	204	1472	1	28	2.2
	2	16	G M H Pty L	20.5	6368	99277	..		
	2	25	Carpet Mfg L	20.7	430(a)	2867	2	1186	48.9
	3	2	North Aust Cement L	20.8	113	1153	..		
	4	6	Union Carbide (A) L	22.3	510	8966	1	?	?
	4	22	M B John & Hattersley L	22.4	269	5681(g)	4	1822	33.7
	5	17	Borg-Warner (A) L	23.1	735	7403	..		
	2	11	Ampol Petrol L	24.2	2278(d)	74183	1	3410	4.7
	2	11	Boral L	26.1	2554	38759	5	13392	37.0
	2	45	S A Rubber H L	26.7	167	7299	2	1780	24.9
	3	3	Blue Metal Ind L	27.8	475	21128	4	2113	10.2
	2	39	Petersville (A) L	28.1	461	16323	8	3606	22.7
	3	3	Concrete Ind L	30.1	357	13323	10	4982	38.4
	2	16	Chrysler Aust L	32.6	795	32809	1	4050	12.7
	2	38	Life Savers (A) L	37.9	195	3595	3	2054	60.4
	4	21	Warburton Franki L	40.2	334(a)	2128	1	132	7.4
	5	35	Allied Mils L	40.6	834	16395	2	3793+	24.4+
	3	42	News L	100.5	282	14608	7	3654	25.5
					Σ=281109	Σ=1905748		Σ=186890	Av.= 11.5

Notes: Column (1) : See Appendix Table C.2
Column (2) : See Appendix Table C.1
Column (5) : (a) 1951 figures
(b) 1952 figures
(c) 1953 figures
(d) 1954 figures
(e) 1955 figures
Column (6) : (f) 1965 figures
(g) 1966 figures
Column (7) : It includes all forms of take-overs, amalgamations and purchase of control of additional assets through obtaining ownership of more than 50 per cent of the voting shares. When the exact number of companies acquired is not known, a question mark is inserted.
Column (8) : When the information concerning value of acquisition is not available a question mark is inserted. When the value of acquisition is incomplete mainly because of undisclosed cash offers made to acquired firms the figures are suffixed by a plus sign.
Sources: Jobson's Investment Digest, Year Book of Public Companies of Australia and New Zealand, 1950-1969

Appendix Table F.3

Transition Matrix : Distribution of Firms by Opening and Closing Size
146 Continuous Firms

Opening Size (1950)	Closing Size (1967) 1	2	3	4	5	6	7	8	9	10	11	12	13	Total Number of Companies (1967)
1	..	2	..	1	1	..	..	..	..	..	..	..	..	4
2	..	..	3	1	4	..	..	..	..	..	..	..	..	8
3	..	1	2	4	3	1	2	1	1	..	..	..	..	15
4	..	..	..	3	5	7	11	4	..	2	..	..	..	32
5	..	..	..	1	2	7	8	4	6	2	1	..	..	31
6	..	..	..	..	1	..	6	6	8	4	..	..	..	25
7	..	..	..	..	..	..	..	4	3	..	2	1	..	10
8	..	..	..	..	..	..	..	1	2	7	..	1	..	11
9	..	..	..	..	..	..	..	..	..	..	3	2	1	6
10	..	..	..	..	..	..	..	..	..	..	1	1	..	2
11	..	..	..	..	..	..	..	..	..	..	..	..	2	2
12	..	..	..	..	..	..	..	..	..	..	..	..	..	
13	..	..	..	..	..	..	..	..	..	..	..	..	..	
Total Number of Companies (1950)	..	3	5	10	16	15	27	20	20	15	7	5	3	146

Appendix Table F.4

Results of Regressions of Net Assets Growth on Profitability

Regression coefficient : r^2

Regression equation : $g_t = a + bp_{(t-1)} + \epsilon$

where a and b are constant terms

ϵ the random error term

g, the growth of net assets (%)

p, net profit rate per net assets (%)

	No. of Companies	Regression of $g_{(1956-61)}$ on $p_{(1950-55)}$				Regression of $g_{(1962-67)}$ on $p_{(1956-61)}$			
		r^2	a	b	ϵ	r^2	a	b	ϵ
(1) 127 'Middle' and 'Slow-growing' firms									
1 small firms	24	.02	8.79	.13	.20	.19	-2.94	.66*	.29
2 medium-size firms	75	.02	7.82	.39	.30	.00	2.83	.06	.28
3 large firms	28	.42	-.46	1.36*	.31	.05	3.16	.49	.42
Total 127 firms	127	.05	7.19	.41*	.16	.01	2.16	.22	.20
(2) Single-trade firms									
1 'Middle' and 'slow-growing' firms	78	.02	7.48	.21	.16	.04	- .87	.46+	.27
2 All firms	87	.00	11.18	.10	.26	.01	6.61	-.24	.31
(3) Diversified firms									
1 'Middle' and 'slow-growing' firms	49	.20	3.66	1.14	.33	.00	4.82	.10	.28
2 All firms	59	.01	15.30	.23	.38	.04	4.38	.35	.22

	No. of Companies	Regression of $g_{(1956-61)}$ on $p_{(1950-55)}$				Regression of $g_{(1962-67)}$ on $p_{(1956-61)}$			
		r^2	a	b	ϵ	r^2	a	b	ϵ
(4) Major industry groups - 146 continuous firms									
1 Cement, etc.	10	.04	9.76	1.16+	1.95	.08	2.87	.96*	1.18
2 Chemicals, etc.	14	.12	5.75	.84	.66	.30	-2.24	1.63*	.72
3 Iron and Steel, etc.	19	.00	17.08	.01	.36	.09	15.57	-.54	.43
4 Electrical Engineering	12	.29	-51.58	7.65+	3.95	.02	3.93	.20	.45
5 Textiles, etc.	44	.003	6.89	.07	.21	.002	.00.	.11	.42
6 Sawmills, etc.	12	.03	9.76	.27	.53	.001	1.92	.07	.65
7 Food, tobacco, etc.	24	.02	9.77	.48	.77	.22	18.79	-1.08*	.43
8 Newspapers	11	.52	31.23	-1.55*	.50	.01	7.71	-.11	.50
(5) Concentration groups - 146 continuous firms									
1 Monopoly and duopoly	12	.51	3.64	1.37*	.42	.0004	6.77	-.05	.81
2 High-oligopoly	27	.08	9.87	.51	.36	.009	11.59	-.26	.53
3 Moderate-oligopoly	29	.07	22.72	-.77	.56	.07	2.34	.65	.46
4 Low-oligopoly	23	.06	-.12	2.09	1.75	.01	6.99	-.18	.32
5 Unconcentrated	34	.05	13.10	-.43	.32	.06	5.89	-.63	.43
6 Competitive	5	.00	12.88	-.11	1.46	.07	5.70	.39	.82
7 High-competitive	16	.01	6.62	.12	.31	.10	-2.06	.41	.33
(6) Total 146 firms	146	.003	12.78	.15	.22	.001	5.18	.05	.19

* Significantly different from zero at less than the 5% level.
\+ Significantly different from zero at the 10% level.

Appendix Table F.5

Retained Profit as Proportion of Net Assets increase; 1950-67; 146 continuous firms - concentration groups.

Concentration Group	(1) Net Retained Profit (£'000)	(2) Increase in Net Assets (£'000)	(3) (1)/(2) %
(i) 1950-55			
1	15043	104570	14.39
2	39446	107810	36.59
3	6209	31296	19.84
4	14091	50635	27.83
5	5993	34645	17.30
6	1541	4849	31.78
7	1892	5379	35.17
All companies	84215	339184	24.83
(ii) 1956-61			
1	56656	330144	17.16
2	57183	163881	34.89
3	14439	57744	25.01
4	17224	112009	15.38
5	8795	45352	19.39
6	1179	2318	50.86
7	2183	5168	42.24
All companies	157659	716616	22.00
(iii) 1962-67			
1	75096	195051	38.50
2	89321	210937	42.34
3	20759	52980	39.18
4	20200	94836	21.30
5	11091	26383	42.04
6	1319	3394	38.86
7	1418	-162	-875.31
All companies	219204	583419	37.57
(iv) 1950-67			
1	146795	629765	23.31
2	185950	482628	38.53
3	41407	142020	29.16
4	51515	257480	20.01
5	25879	106380	24.33
6	4039	10561	38.24
7	5493	10385	52.89
All companies	461078	1639219	28.13

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