A GLOBAL STUDY ON THE RELATIONSHIP BETWEEN FIRMS' DIVERSIFICATION INTO THE FINANCIAL SERVICES INDUSTRY AND THEIR FINANCIAL PERFORMANCE

A Thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Business Administration

by
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ABSTRACT

Over the last two decades, fundamental changes have occurred in the financial services industry which industry observers term "revolutionary". Authoritative observers consider deregulation, developments in information and communications technology (ICT) and changes in the economic environment to be three of the most important driving forces behind the changes which have occurred in the industry. These developments have also resulted in a number of less traditional players such as non-financial companies and financial conglomerates becoming increasingly involved in the financial services industry. In this Thesis, non-financial companies are defined as companies which are involved in the provision of financial services but which derive the major part of their income from other business activities. Ford Motor Company and Marks & Spencer are typical examples.

Although the literature on diversification indicates that several benefits such as synergy, economies of scope, the reduction of transactions costs through the creation of internal capital and other markets, an increased borrowing capacity and a reduction of the tax burden may arise through this strategy, the empirical studies fail to reach consensus on the matter. The studies are not conclusive as to whether diversification into related areas of activity has resulted in benefits to firms though there is some agreement that 'unrelated' or 'conglomerate' diversification has produced few benefits. It thus appears paradoxical that a substantial number of non-financial companies have diversified into the financial services industry and the objective of this Thesis is to determine whether these firms derived any real financial benefit by diversifying into the industry.

To investigate this issue, two samples of quoted non-financial companies were drawn from the Worldscope database. A sample of 716 non-financial companies was matched with a similar number of control companies on the basis of their SIC code, market capitalisation, market-to-book ratio and geographic location. A sample of 148 non-financial companies was matched with a similar number of pseudo control companies on the basis of their SIC code, financial and non-financial segmental sales value and geographic location. The financial performance of the non-financial and control groups of companies between 1989 and 1998 was then compared, share return being used as the main gauge of financial performance.

The results of the analyses carried out indicate that the non-financial companies generally reaped financial benefits by diversifying into financial services whilst they did not generally suffer financial disadvantages by implementing this strategy. However, the study also reveals that differences in the non-financial companies' financial performance emerge when these are analysed according to the different types of financial services products they offer, the geographic areas in which they operate and the primary industry in which they operate. Differences also emerge when the non-financial companies' financial performance is analysed according to the degree of their diversification into financial services activities. The evidence suggests that the non-financial companies' advantageous financing structures contributed to the achievement of their financial results and it is hypothesised that these companies were in a position to develop such structures as a result of their diversification into financial services activities, this being due to their enhanced ability to develop internal capital markets and to liase with external suppliers of funds which increased their opportunities to obtain finance whilst reducing the related transactions costs. Evidence of synergy between the non-financial companies' financial services and non-financial activities emerges in this context. Since the non-financial companies are engaged in a moderate amount of diversification into financial services activities, and the literature equates a moderate amount of diversification with related diversification, support is also provided to the theoretical arguments that firms would be expected to benefit by diversifying into related areas of activity.

To my wife Taygeta
and my son Stuart

Thanks for your patience
and understanding

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CHAPTER 1: INTRODUCTION

1.1 Background to the Study

Over the last two decades, fundamental changes have occurred in the financial services industry which industry observers term "revolutionary". Several authoritative observers (Ballarin (1986), Kimball Dietrich (1996), Taylor and Morison (1999)) consider deregulation, developments in information and communications technology (ICT) and changes in the economic environment to be three of the most important driving forces behind the changes which have occurred in the industry.

The deregulation of the financial services industry has allowed, and has also stimulated, many of the traditional participants in the industry such as commercial banks and building societies to broaden their product range and to widen the scope of their geographic operations. This process has been facilitated by developments in ICT, such as the growth of the internet in recent years, which have introduced major changes in respect of the links between financial services firms and their customers and in respect of the links between the financial services firms themselves. Furthermore, economic factors such as the volatility of exchange rates have placed pressures upon the participants in the financial services industry to innovate and to offer more cost-effective products. Competition within the industry intensified as a result of these developments, with consequent pressures being put upon the rate of return earned by the firms operating in the industry.

The developments outlined above have also resulted in a number of other, less traditional, players such as non-financial companies and financial conglomerates becoming increasingly involved in the financial services industry. For the purposes of this Thesis, non-financial companies are defined as companies which are involved in the provision of financial services but which derive the major part of their income from other business activities. Ford Motor Company and Marks & Spencer are typical examples. Although the entry of non-financial companies into the financial services industry is not a new phenomenon and in the case of some companies goes back to the

early part of the last century (Rosenblum and Pavel (1986)), the pace of entry of these companies into the industry has accelerated in recent years, the deregulation of the industry and developments in ICT being amongst the major factors which have contributed to this trend. Industry analysts (Grant (1987), Leach (1994)) surmise that the exploitation of economies of scope and the reduction of transactions costs are two of the main factors which have motivated non-financial companies to diversify into the industry.

Notwithstanding the fact that the entry of non-financial companies into the financial services industry has been recognised as being of major size and significance by several industry analysts, and that the phenomenon is expected to grow in scale and importance in future years, the existing body of knowledge on the subject is quite limited. In particular, little is known as to whether the non-financial firms which implemented this strategy derived any financial benefit by so doing. Although the literature on diversification indicates that several benefits may arise from such a strategy, the empirical studies fail to reach consensus on the matter. The studies are not conclusive as to whether diversification into related areas of activity has resulted in benefits to firms though there is some agreement that 'unrelated' or 'conglomerate' diversification has produced few benefits. In view of the lack of conclusive evidence in the literature as to whether any benefits have been derived through diversification in practise, it appears paradoxical that a number of non-financial companies have diversified into the financial services industry and further research into this phenomenon is indicated in order to establish whether these companies have in fact derived any financial benefit by diversifying into the industry.

The objective of this Thesis is thus to investigate the phenomenon of the diversification of non-financial companies into the financial services industry and in particular to seek to determine whether the firms which implemented this strategy derived any financial benefit by so doing.

The author's interest in this subject-matter was stimulated by his own position of Finance Director in a non-financial group of companies in Malta which has chosen to diversify into the financial services industry. The author was entrusted with

implementing this strategy and the answers to the investigation undertaken in this study were thus of interest to him at both a conceptual and work-related level.

1.2 Importance of Study

The importance of carrying out this study may be viewed at two levels. At one level, the study seeks to determine whether a business phenomenon which is widespread and which is growing in scale and importance, namely the diversification of non-financial companies into the financial services industry, has resulted in any financial benefit or disadvantage to the firms which implemented this strategy. At a more fundamental level, the study seeks to contribute to the literature on diversification by attempting to draw conclusions from a specific case of diversification about the financial benefits or disadvantages which firms generally may derive from diversification.

Although a vast literature on the theoretical benefits and disadvantages of diversification exists, there is little consensus in the literature as to whether the benefits have in practise been reaped, or the disadvantages suffered, by the firms which implemented a diversification strategy. The literature on the issue, which is reviewed extensively in Chapter 2, suggests that the main benefits which may arise from diversification include synergy, economies of scope, the reduction of transactions costs through the creation of internal capital and other markets, an increased borrowing capacity and a reduction of the tax burden. On the other hand, severe problems may arise as a firm diversifies in the integration of the firm's existing activities with its new activities and in the management of the more complex organisation. Some of the benefits of diversification are more likely to arise from a strategy of related diversification whilst others are more likely to result from a conglomerate diversification strategy.

Notwithstanding that several benefits would be expected to arise from diversification, the empirical evidence as to whether related diversification has generally had positive effects upon firms' financial performance is not conclusive. There appears to be some evidence, however, that conglomerate diversification has not generally resulted in significant improvements in firms' performance, possibly due to the increasing difficulty of managing firms as their size and diversity increase. Summing up the results

of the research on the relationship between diversification and financial performance over the last thirty years, Palich et al. (2000, p.156) conclude that "Despite the proliferation of studies on the subject, no clear consensus exists regarding the state of knowledge to date."

The existing body of knowledge on the diversification of non-financial companies into the financial services industry is quite limited. The studies which focus specifically upon the phenomenon (Leach (1994), Lascelles (1999)) are descriptive in nature and do not utilise the rigorous methodological approach employed in the academic empirical research studies on diversification. None of the academic works reviewed by the author specifically attempted to examine the relationship between the entry of non-financial firms into the financial services industry and the financial performance of these firms. Yet as Grant (1987, p.2) points out, "The financial services industry provides a particularly fertile field for such a study (as)...innovation, growth and regulatory change have provided a spectacular impetus for diversification."

In conclusion, the importance of carrying out this research study emerges from the following two considerations:

(i) by carrying out a study on diversification in a relatively unexplored, yet "particularly fertile" area, the study could contribute towards resolving the unsettled state of the literature on the relationship between diversification and financial performance.

(ii) the study could provide important guidelines for the management of non-financial firms which have diversified, or which are considering diversifying, into the financial services industry with respect to the likely impact of such a strategy upon their firms' financial performance.

1.3 Research Question and Hypotheses

Following the above discussion, the research question of this Thesis is formulated as:

Does diversification into the financial services industry significantly improve the financial performance of non-financial companies which diversify into the industry?

As noted above, the literature on diversification suggests that the main benefits which may arise from diversification include synergy, economies of scope, the reduction of transactions costs through the creation of internal capital and other markets, an increased borrowing capacity and a reduction of the tax burden. Some of these benefits such as synergy and economies of scope are more likely to arise from a strategy of related diversification whilst others such as an increased borrowing capacity and a reduction of the tax burden are more likely to result from a conglomerate diversification strategy. In both related and conglomerate diversification strategies, firms would be expected to reap benefits by reducing their transactions costs through the development of internal capital and other markets.

It is hypothesised in this Thesis that non-financial firms would derive benefits through their diversification into the financial services industry primarily as a result of:

- the exploitation of synergy and economies of scope. Several opportunities exist for non-financial firms to derive synergies and economies of scope by diversifying into financial services activities by, for example, using their existing client base, brand name and distribution channels to market financial services products (Grant (1987), Leach (1994)). As noted above, the literature indicates that these benefits are more likely to be obtained by companies which engage in related, rather than conglomerate, diversification. The literature also suggests that a moderate amount of diversification is more likely to be associated with related than with conglomerate diversification. Since, by definition, non-financial companies are engaged in a moderate amount of diversification into financial services activities it is surmised that several of the non-financial firms would be engaged in financial services activities which are in some way related to their existing activities or assets (such as providing credit or rental facilities related to their current activities or assets) and should thus be in a good position to take advantage of synergies and economies of scope. However, the possibility that some of the non-financial firms may be concurrently, or solely, following a strategy of unrelated diversification is not excluded.

- the reduction of transactions costs through the creation of internal capital and other markets which has been identified by several authors (Williamson (1975), Grant (1995), Stein (1997)) as a major potential benefit of both related and conglomerate diversification. Several opportunities exist for non-financial firms to develop internal capital and other markets and thereby reduce their transactions costs by diversifying into financial services activities. Transactions costs may be reduced by, for example, the handling of a firm's insurance requirements by its own insurance operation. A firm's involvement in financial services activities and the development of its competencies in this area would enhance its opportunities and its ability to create and operate an internal capital market.

Since both the achievement of economies of scope and the reduction of transactions costs would be expected to improve a firm's profitability and thereby lead to an increase in the firm's share return, which in this Thesis is held to be the main gauge of a company's financial performance, the following research hypothesis is formulated:

That diversification into the financial services industry significantly improves the financial performance of non-financial companies which diversify into the industry.

1.4 Design of Research Study

The author's orientation and training lead him to adopt a positivist stance in this Thesis and the research design chosen to test the research hypothesis is the quasi-experimental method whereby the financial performance of a number of firms which have diversified into the financial services industry (the experimental or sample or non-financial companies) is compared with the financial performance of a number of firms which have not diversified into the industry (the control or match companies). When this research design is employed it is important to maintain comparability (or equivalence) between the experimental and the control groups (Ryan et al. (1992)). It is attempted to achieve this in this Thesis primarily by matching each of the experimental companies with a control company on the basis of size and market-to-book ratio, two factors which the literature (Fama and French (1992)) indicates play a key role in the determination of share return. Although, as noted above, share return (or Investment Return (IR)) is held

to be the main gauge of companies' financial performance in this Thesis, three accounting ratios, namely Return on Assets (ROA), Return on Invested Capital (ROIC) and Return on Equity (ROE) are also utilised as measures of financial performance.

Due to the fact that the firms in the experimental and control groups are drawn from a number of different countries in this study, a further important matching criterion is that each experimental firm is **ONLY** matched with a control company originating from the same country, thus ensuring that each pair of companies was subjected to the same political, economic, social and business environment and that each pair was regulated by the same accounting principles and conventions.

The research hypothesis formulated above is thus operationalised as:

That there is a significant difference between the financial performance (IR, ROA, ROIC and ROE) of non-financial companies which have diversified into the financial services industry (the experimental or sample companies) and the financial performance (IR, ROA, ROIC and ROE) of companies which have not diversified into the industry (the control or match companies) in favour of the experimental companies.

Using data sourced from the Worldscope database, two samples were formed to test the research hypothesis, namely:

- the SIC sample made up of 716 pairs of experimental and match companies. The experimental companies were chosen on the basis of their SIC (Standard Industrial Classification) codes and match companies were identified for each experimental company on the basis of their SIC code, market capitalisation, market-to-book ratio and geographic location.

- the SEG sample made up of 148 pairs of experimental and pseudo match companies. The experimental companies were again chosen on the basis of their SIC codes and two control companies were identified for each experimental company on the basis of their SIC code, financial and non-financial segmental sales value and geographic location.

Parametric and non-parametric statistical methods were then used to test the null hypothesis that no statistically significant differences existed between the financial performance of the experimental and control groups of companies.

1.5 Definitions

In this Thesis, diversification is defined as taking place when a firm or business unit enters into new lines of activity which are sufficiently different to its existing lines of activity to imply some significant difference in the firm's production or distribution processes.

A firm may engage in related or unrelated diversification. Related diversification is defined as a form of diversification which builds on a firm's existing assets or activities whilst in unrelated (or conglomerate) diversification there is no close relationship between a firm's new activities and its existing assets or activities.

Financial intermediation is defined as the channelling of funds between individuals and institutions who wish to lend and individuals and institutions who wish to borrow.

A Glossary of other terms used in this Thesis is provided on page 244.

1.6 Research Tasks

The following key tasks were undertaken to carry out this research study:

(i) the literature on diversification was reviewed extensively with particular reference to the literature on the relationship between diversification and financial performance and the literature on the diversification of non-financial companies into the financial services industry.

(ii) the literature on alternative research designs was reviewed and a decision to employ the quasi-experimental method reached. Prior academic studies,

particularly in the finance area, which had employed this research method were also reviewed.

(iii) a research model was established in which the two conditions of the independent variable were specified as being whether or not a company had diversified into the financial services industry whilst the dependent variable was specified as being the financial performance of the companies which had diversified into the financial services industry (the experimental or sample companies) and the financial performance of companies which had not diversified into the industry (the control or match companies). The criteria on which to measure financial performance were determined as well as the criteria on which to match the experimental and control companies.

(iv) the financial databases available at Henley Management College were evaluated and it was concluded that the Worldscope database was the most appropriate database to utilise on the grounds that (a) the database held the information required to carry out the study (b) the database has been used for several years by a number of established institutions and was the source of information for previous academic studies and (c) the database was available through the internet to the author's residence in Malta.

(v) as described in detail in Chapter 4, the SIC sample was formed by first identifying the companies on the database which (a) met the definition of non-financial companies and (b) for which, as a minimum, data relating to 1998 market capitalisation, market-to-book ratio and investment return was available on the database. Computer programs were then written to identify suitable match companies on the basis of their SIC code, market capitalisation, market-to-book ratio and geographic location. In total, 716 pairs of companies were identified.

(vi) the SEG sample was next formed by identifying the companies in the SIC sample for which information relating to 1998 financial and non-financial segmental sales was available on the database. Computer programs were written to identify suitable match companies for the experimental companies' financial and non-financial segments on the basis of their SIC code, financial and non-financial segmental sales value and geographic location. The two match companies identified for each

experimental company were then combined into a pseudo match company. In total, 148 pairs of companies were identified.

(vii) the annual investment return and accounting ratio data for the 1989 - 1998 period for the 716 pairs of companies in the SIC sample and the 148 pairs of companies in the SEG sample were downloaded from the Worldscope database and transferred to Excel spreadsheets. The annual IR data was then compounded over varying periods of years whilst the annual accounting ratio data was averaged over varying periods of years.

(viii) the data obtained in (vii) were analysed by the experimental companies' financial services activity, geographic location, primary industry and segmental sales data. A number of parametric and non-parametric tests were carried out on the data on SPSS and conclusions reached on the experimental groups' financial performance compared to that of the control group.

(ix) prior to carrying out each of research tasks (v) to (viii) above, pilot tests on the data relating to U.K. companies were made to test the computer programs and models built to handle the extensive data processing exercises involved in carrying out these research tasks.

(x) finally, the Thesis was written up for submission to Henley Management College / Brunel University.

1.7 Structure of Thesis

The Thesis is structured as follows:

In Chapter 2 a conceptual framework is developed for the study of the business phenomenon which constitutes the subject-matter of this Thesis, namely the diversification of non-financial companies into the financial services industry. The literature on diversification is reviewed extensively with particular reference to the literature related to the diversification of non-financial companies into the financial

services industry and the literature on the relationship between diversification and financial performance.

Chapter 3 outlines the research methodology used to investigate the research question posed in this study. Research methodology is first discussed in general terms and this is followed by a description of relevant quantitative methods and techniques. Finance and accounting issues related to the subject-matter of the Thesis are examined following which the design of the research study is outlined. Finally, the research hypotheses are developed and formulated.

The process undertaken to collect and organise the data required to test the hypotheses is described in Chapter 4. The structure of the Worldscope database is first outlined and this is followed by a detailed discussion on the procedures used to identify the non-financial and control companies in the SIC and SEG samples. A profile of the characteristics of the companies constituting the SIC and SEG samples is presented and discussed. The financial data collected for each of the non-financial and control companies is next described and the Pilot Study carried out to test the data collection and processing exercise is outlined. Finally, the alternative methodologies which could have been utilised in the execution of the research study are discussed.

The analysis of the data relating to the SIC and SEG non-financial and control companies commences with a review of the overall IR results in Chapter 5 and conclusions based on this analysis are reached. This is followed in Chapter 6 by further analysis of the IR data on the basis of the non-financial companies' financial services activities, their geographic location, their primary industry and their segmental sales data to examine the business activities of the non-financial and control companies in further depth. Finally, the results relating to the accounting ratio data (ROA, ROIC and ROE) are presented, analysed and discussed in Chapter 7. Before commencing the analysis in Chapter 5, a brief outline of the global economic and financial environment in the 1990's is presented to serve as a background for the discussion on the non-financial and control companies' financial performance.

In Chapter 8, the results which emerge from the analysis of the data carried out in Chapters 5, 6 and 7 are synthesised with the theoretical arguments made in previous

Chapters. The main research findings are summarised and the main research conclusions and contributions outlined. Finally, the limitations of the study are noted and recommendations for future research are made.

CHAPTER 2: LITERATURE REVIEW

SECTION 2.1: INTRODUCTION TO LITERATURE REVIEW

The objective of this Chapter is to develop a conceptual framework for the study of the business phenomenon which constitutes the subject-matter of this Thesis, namely the diversification of non-financial companies into the financial services industry. To achieve this objective, this Chapter will seek to review the literature related to the Thesis topic in sufficient breath and depth to provide this conceptual framework.

As noted in the previous Chapter, non-financial companies are defined as companies which are involved in the provision of financial services but which derive the major part of their income from other business activities. Ford Motor Company and Marks & Spencer are typical examples.

Following this introductory Section, the Chapter is structured as follows:

- **Section 2.2** traces developments in the financial services industry, with particular reference to the diversification of non-financial companies into the industry, in order to place the phenomenon under study within its historical and industrial context. The main driving forces behind the changes which have occurred in the financial services industry over the last two decades, namely deregulation, developments in information and communications technology and changes in the economic environment are examined and Porter's (1980) framework is utilised to analyse competition within the industry. It is concluded from this analysis that whilst the recent developments in the financial services industry have made it easier for new players to enter into the industry, increased pressures have also been placed upon the rate of return earned by the participants in the industry. Finally, the literature on the diversification of non-financial companies into the financial services industry is reviewed in this Section.

To place the phenomenon under study within its theoretical context, **Section 2.3** reviews the literature on diversification with particular reference to the nature of diversification, the reasons for diversification and the different methods of diversification (internal development, merger and acquisition and strategic alliances). Finally, several empirical studies which have sought to assess the performance of diversifying firms are reviewed and critiqued in this Section.

In **Section 2.4,** the material presented in the previous two Sections is summarised chronologically and conclusions are drawn from it with particular reference to whether the studies reviewed reveal any pattern of impact that varies over time with respect to the diversification of non-financial companies into the financial services industry.

Finally, **Section 2.5** summarises the material contained in the previous Sections and draws conclusions from the literature reviewed. It is noted that, although the literature indicates that several benefits may arise through diversification, the empirical studies fail to reach consensus on the matter. The studies are not conclusive as to whether diversification into related areas of activity has resulted in benefits to firms though there is some agreement that 'unrelated' or 'conglomerate' diversification has produced few benefits. It thus appears paradoxical that a substantial number of non-financial companies have diversified into the financial services industry which underlines the importance of carrying out research into this phenomenon to determine whether these firms derived any real financial benefit by diversifying into the industry. The discussion in this Section leads to the formulation of the research question of this Thesis, namely:

Does diversification into the financial services industry significantly improve the financial performance of non-financial companies which diversify into the industry?

The research carried out in this Thesis to answer the research question is expected to throw further light upon the effects of diversification on firms' performance and thus contribute towards resolving the unsettled state of the literature on the matter.

SECTION 2.2: THE FINANCIAL SERVICES INDUSTRY

2.2.1 Introduction

In order to place the phenomenon under study within its historical and industrial context, Section 2.2.3 outlines the major developments which have occurred in the financial services industry over the last two decades and examines the main driving forces behind these changes. Porter's (1980) framework is utilised in Section 2.2.4 to analyse competition within the industry whilst Section 2.2.5 discusses the effects which the developments in the financial services industry have had upon the firms operating in the industry. Finally, the literature on the diversification of non-financial companies into the financial services industry is reviewed in Section 2.2.6.

2.2.2 The Nature of Financial Intermediation

Financial markets exist in order to facilitate the transfer of funds between individuals and institutions having surplus funds and individuals and institutions requiring those funds. The transfer of funds between those having surplus funds and those needing the funds may take place by direct transactions between the parties concerned or through financial intermediaries. Elaborating on the financial intermediation process, Goacher et al. (1987, p.1) comment that this "involves the channelling of funds between those who wish to lend and those who wish to borrow" and Johnson (2000) confirms this view, noting that financial intermediation consists of the process of facilitating the flow of funds from surplus savings units to deficit savings units.

Goacher et al. (1987) and Johnson (2000) point out that the financial intermediation process is carried out by various types of financial institutions. They classify the financial institutions into two broad categories, namely those which take deposits such as commercial banks and building societies and those which do not take deposits such as life insurance companies, pension funds, finance houses, unit trusts and investment trusts. The various types of financial institutions together comprise the financial services industry.

2.2.3 Development of the Financial Services Industry

Several authors note that the financial services industry in many countries has undergone radical changes in recent years. Kaufman et al. (1983, p.8) state that "There are few areas of life where accelerating change has been more evident than in the markets for financial services." Ballarin (1986, p.3) adds that "The competitive structure of the financial services industry is undergoing a rapid transformation in many countries of the western world. The speed at which these changes have taken place and their importance would seem to justify the use of the term "revolution" to describe the phenomenon in its entirety." Anderton (1995, p.1) remarks that "The financial services sector has been, arguably, the most dynamic sector in developed western economies over the last 25 years, showing an amazing capacity for change, innovation and adaptation."

Deregulation, developments in information and communications technology and changes in the economic environment are considered by several authors (Ballarin (1986), Kimball Dietrich (1996), Taylor and Morison (1999)) to be three of the most important driving forces behind the fundamental changes which have occurred in the financial services industry in the last two decades. Each of these three factors is now considered in turn.

2.2.3.1 Deregulation

The financial services industry has traditionally been one of the most highly regulated industries in many countries. Lewis and Davis (1987) note that the financial system is considered by many to play an important role in the determination of macroeconomic activity and in the facilitation of production and exchange within an economy. A high degree of regulation of the financial system was thus felt necessary in order to protect the system from the waves of crisis and panic to which it was vulnerable and also to avoid an undue concentration of economic and financial power within the system. Fabozzi et al. (1994) concur, suggesting that the main reasons for the traditionally high level of regulation of the financial services industry were to regulate trading in financial markets in order to protect investors, to promote the stability of financial institutions in

view of their important role in the functioning of the economy and to restrict the activities of foreign concerns within domestic markets.

Kaufman et al. (1983, 1984) trace the historical development of the regulation of the financial services industry in the U.S. They attribute the growth of the regulatory regime in that country mainly to the problems created by the Great Depression of the 1930's which resulted in several banking failures. The diagnosis at the time was that these failures had resulted mainly from excessive competition amongst the banks coupled with managerial errors and abuses. Consequently, legislative measures were introduced to reduce competition amongst the banks and thus attempt to prevent a recurrence of these events. The legislative measures introduced included restrictions on the interest rate levels payable by banks, restrictions on the geographic expansion of banks, the introduction of deposit insurance and the separation of the activities of commercial banks from those of investment banks.

Continuing their historical analysis of the regulation of the financial services industry in the U.S., Kaufman et al. (1983, 1984) point out that during the 1960's and 1970's pressures grew to relax the regulatory regime which had been imposed upon the financial services industry in previous years. These pressures arose from several sources, including the fact that rising interest and inflation rates in the 1970's made it untenable for banks to maintain ceilings on the interest rates they paid. Also, rapid advances in information technology diluted the effectiveness of the geographic restrictions placed upon banks. Furthermore, banks faced increasing competition from non-bank financial institutions which were not subject to certain of the restrictions imposed upon the banks. Thus, primarily as a result of the above-mentioned factors, and also due to a political climate in the U.S. which generally favoured the liberalisation and encouragement of competitive forces, the 1980's and 1990's saw a reduction in the level of regulation imposed upon the financial services industry in that country and a consequent increase in the level of competition within the industry. The enactment of the Gramm-Leach-Bliley Act in the U.S. in 1999, which allows financial services providers to offer previously restricted combinations of financial products, further encouraged the trends noted above in the development of the financial services industry.

Several authors (Canals (1993), Kimball Dietrich (1996), Flier et al. (2001)) remark that similar developments have also occurred in several Western European countries where a traditionally tight regulation of the financial services sector was followed in recent years by regulatory reform and an increase in the level of competition in the sector. The movement towards the creation of a single market within the European Union was a further stimulus towards the deregulation of the financial services industry in Western Europe. The attitude of the Authorities towards the development of the financial services industry is reflected in an article by Leigh-Pemberton (1984), then Governor of the Bank of England, who wrote (p.45) that "I believe that the most constructive contribution that can be made by the authorities is to be liberal in their approach, ready to accept that the convenience of many traditional demarcations and ways of doing business may need to be set aside so that new energies and enterprise can be released."

2.2.3.2 Information and Communications Technology

The rapid development of information and communications technology (ICT) in recent years is a well known phenomenon which has had an impact upon many industries including the financial services industry. Devlin and Wright (1995) note that ICT has introduced major changes in respect of the links between financial services firms and their customers and in respect of the links between the financial services firms themselves. Developments in ICT have also resulted in the extensive use by financial services firms of databases containing the information they have available on their customers. The customer information held on the databases is used by the firms for marketing and product development purposes.

In the case of links with customers, Devlin and Wright (1995) and Flier et al. (2001) point out that ICT has made it possible for funds to be transferred electronically at the place of service (through automatic teller machines or ATM's), at the point of sale (through electronic funds transfer at point of sale or EFTPOS machines) and at the place of living (through home banking or EFTPOL). ICT has also made possible the rapid diffusion of credit cards and the introduction of the more sophisticated 'smart' cards. Furthermore, electronic links between financial services firms, sometimes involving the use of shared networks, have greatly facilitated the exchange of information between these firms. In the last few years, the advent of cable and digital broadcasting systems

and of the internet has vastly expanded ICT's ability to create linkages between financial services firms and their customers and between financial services firms, resulting in "a financial communication system of almost unimaginable versatility" (Morison (1999, p.67)). These latest developments have given rise to more innovative financial services products such as telephone banking and internet banking.

Anderton et al. (1995) note that the costs of firms in the financial services industry arise mainly from the management of information and from the execution of transactions. The application of ICT in these two areas, both traditionally labour intensive, has helped firms in the industry to reduce or at least to contain their operating costs. The authors warn, however, that the increasing use of ICT is not without its dangers and they note particularly that investments in ICT can rapidly become obsolete and difficult to maintain.

2.2.3.3 The Economic Environment

As previously noted, the rise in inflation rates and in interest rates during the 1970's had important effects upon the financial services industry. Thus, for example, the rise in interest rates made it untenable for banks in the U.S. to maintain ceilings on the level of interest they paid resulting in pressures being put upon the Authorities by the banks to remove this regulatory measure. Ballarin (1986) points out that the rise in interest rates also made the users of finance become more aware of the costs of finance, giving them an incentive to attempt to reduce these costs by considering using alternative financial products and financial intermediaries. The users of finance also had an incentive to avoid financial intermediaries altogether and go directly to the capital markets to issue their own commercial paper. Johnson (1993, p.11) notes that "Major corporate clients have found it more economical to borrow short-term funds in the commercial paper market directly from the investing public rather than to borrow from a bank."

Various authors (Canals (1993), Fabozzi et al. (1994)) point out that another economic factor which significantly effected the development of the financial services industry during the 1980's and the 1990's was the volatility of exchange rates. This resulted from the abandonment of a fixed exchange rate system by Western countries in the 1970's and its replacement (excluding the European Monetary System which only

allowed partial fluctuation of the currencies within it) by a floating exchange rate system. The volatility of exchange rates resulted in the development by the financial services industry of new financial products such as currency option contracts and currency swaps designed to control the risks arising from exchange rate fluctuations.

2.2.3.4 Globalisation

Several authors (Fabozzi et al. (1994), Morison (1999) observe that an important effect of deregulation and ICT upon the financial services industry has been the increasing globalisation of the industry. These two factors have facilitated the spread of financial services firms and their products beyond their national boundaries and resulted in the integration of national financial markets into a global financial market.

2.2.3.5 Summary and Conclusions

Fundamental changes have occurred in the financial services industry over the last two decades, the increasing competition within the industry and its globalisation being amongst the major developments which have taken place. Deregulation, developments in information and communications technology and changes in the economic environment are three of the most important driving forces behind the changes which have occurred in the industry. As discussed in the following Sections, these developments in the financial services industry have several implications for the diversification of non-financial companies into the industry.

2.2.4 Competitive Analysis of the Financial Services Industry

Gardener (1990a, 1990b) states that the 'five forces' model put forward by Porter (1980) is an important and well-tested framework for analysing competition and competitive strategies within an industry. Although the model suffers from certain limitations, particularly insofar as it does not take account of the dynamic interaction between competing firms, it nevertheless provides a powerful organising framework for classifying information about an industry's structure and for predicting the implications of these structural features for competitive behaviour (Grant (1995)). Kimball Dietrich (1996) concurs with Gardener (1990a, 1990b) that Porter's (1980) framework can be

usefully applied to analyse competition within the financial services industry and the model is utilised in this Section as the framework around which the discussion on this subject is organised.

Oster (1994) describes an efficient market as one in which prices reflect information instantaneously and one in which extraordinary profit opportunities are thus rapidly dissipated by the action of profit-seeking individuals in the market. Typically, in the early stages of an industry's development, there is too little industry capacity allowing extraordinary profits to be earned by the firms already operating in the industry. These extraordinary profits are likely to stimulate the firms operating in the industry to increase their capacity and/or to attract new entrants into the industry resulting in an increase in the industry's capacity and to an eventual dissipation of the extraordinary profits.

Oster (1994) notes that, in spite of the theoretical appeal of the above analysis, it is evident that some industries regularly outperform others, even over quite long periods of time. Porter's 'five forces' model provides an important contribution here by defining the factors which to a large extent explain the overall level of current and potential profitability in a given industry thus accounting for the perceived differences in the performance of different industries. The five forces are:

- the barriers to entry faced by potential competitors.

- the negotiating power of suppliers.

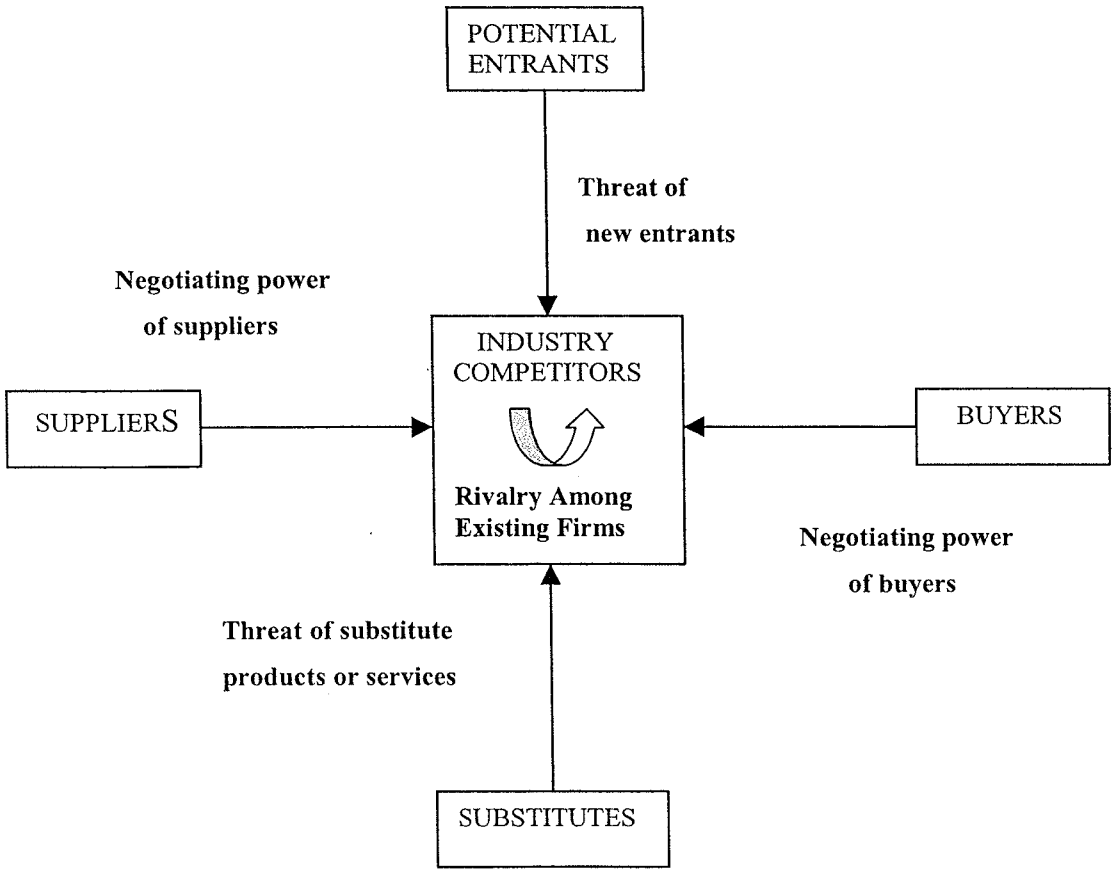
- the negotiating power of buyers.

- the risk that substitute products may appear.

- the degree of rivalry existing between the companies currently competing in the industry.

The five forces may be depicted graphically as in Figure 2.1 below:

Figure 2.1: FIVE FORCES MODEL (PORTER (1980))



Porter (1980) holds that the collective strength of these five competitive forces determines the level of profitability in an industry, profitability being measured by the rate of return on invested capital of the firms in the industry. Whilst competition within an industry works to drive the rate of return towards its "free market" level, the actual rate of return earned by the firms in the industry may be higher or lower than the "free market" level as a result of the relative strength of each of the five competitive forces. (The author defines the "free market" rate of return level as the yield on long-term government securities adjusted upward by the risk of capital loss).

Thus, for example, high entry barriers may dissuade firms from entering into an industry even though abnormally high profits are being earned by the firms already operating in the industry and this may prolong the advantageous position enjoyed by the latter firms. When the negotiating power of an industry's suppliers and buyers is strong, this may depress the industry's rate of return since the former may use their negotiating power to raise the cost of their supplies to the industry whilst the latter may seek to reduce the price at which they purchase the industry's output. The availability of

substitute products influences the ability of the firms operating in an industry to raise the prices of their products and thus effects the level of the rate of return they can earn. Finally, the greater the degree of rivalry which exists between the firms operating in an industry, the greater is the likelihood of price wars and similar occurrences taking place which would tend to depress the rate of return being earned in the industry. Each of the five forces, and the effects of each force upon competition in the financial services industry, is now considered in turn.

2.2.4.1 Barriers to Entry

Entry barriers refer to those factors which tend to impede the entry of new entrants into an industry. Porter (1980) states that entry barriers include government policy, capital requirements, economies of scale, the degree of product differentiation by customers, the costs of switching from one supplier to another, the relative ease of access to distribution channels by new entrants and other cost advantages which established firms in an industry may have such as experience in the industry and favourable access to raw materials. The author adds that the potential reaction of the established firms in an industry towards a new entrant may also constitute a barrier to entry if the established firms react in a hostile and aggressive manner.

Canals (1993) notes that the first two entry barriers mentioned above can significantly impede the entry of new firms into the financial services industry. The regulatory regime can prevent or encourage new entrants into the industry although the current trend in the U.S. and Western Europe towards deregulation should make it easier for new firms to enter into the industry. Capital requirements may be those imposed by the regulatory Authorities such as the minimum capital requirements for setting up a bank or those arising for operational reasons such as investments in computer systems or bank branches.

Economies of scale are defined by Oster (1994) as the decline in unit costs as output increases whilst economies of scope arise when the costs of production of two lines of business run together are less than the sum of each run separately. Canals (1993) points out that both types of economies may present significant entry barriers to new entrants into an industry if the economies are already being reaped by the established firms in

the industry since it may take some time before the new entrants also start to reap these economies. The author adds however that studies on the subject indicate that the existence of economies of scale in the banking industry are doubtful although there would appear to be several opportunities for economies of scope. Thus, for example, the information that a bank holds about a client with respect to his or her deposits can be useful in determining what other financial services to offer to the client. Lewis and Davis (1987), as well as Walter (1999), confirm that studies on economies of scale in the banking industry conclude that these economies are not significant and peter out at a moderate-size firm level.

As noted by Porter (1980), a further barrier to entry may arise if there exists a high level of product differentiation amongst the customers of the firms operating within an industry since it may be difficult for a new entrant to persuade these customers to switch to its products. Ballarin (1986) remarks however that financial services resist differentiation by their very nature and this is supported by Canals (1993) who states that the overall level of product differentiation within the banking industry is not very strong, unless the products are exceptionally innovative. The latter author adds that since the level of product differentiation is relatively low, ease of access to distribution channels is particularly important to new entrants into the financial services industry.

May (1987) argues that none of the above-mentioned entry barriers are of significant importance in the financial services industry. Government policy in most Western countries favours increased competition in the industry and capital requirements are thus not designed to deny access into the industry but rather to ensure safety for depositors. The author concurs with Canals (1993) that there is little evidence of the existence of economies of scale or of strong product differentiation in the banking industry. May (1987) also holds that the costs of switching from one financial services supplier to another are minimal and that, due to developments in ICT, the lack of access to traditional distribution channels such as bank branches no longer constitutes a significant barrier to new entrants into the financial services industry. Finally, May (1987) suggests that, partly as a result of the rapid changes occurring in the financial services industry, the significance as an entry barrier of the prior experience possessed by established firms in the industry has diminished.

2.2.4.2 The Negotiating Power of Suppliers and Buyers

As noted in Section 2.2.2, the essential function of the firms operating in the financial services industry is to act as intermediaries between people and institutions with budget surpluses and people and institutions with budget deficits. The 'suppliers' to the financial services industry are thus the individual and institutional savers who provide funds to the financial intermediaries whilst the 'buyers' are the individuals and institutions who utilise the funds sourced by the financial intermediaries.

Porter (1980) notes that the negotiating power of suppliers would be strong if they are few in number, if their industry is not competitive, if their products are highly differentiated, if changing from one supplier to another implies high switching costs and if the sellers can pose a credible threat of forward integration. The suppliers to the financial services industry cannot therefore be said to have traditionally held a strong negotiating position since they have been large in number offering undifferentiated products with low switching costs.

Similarly, Porter (1980) states that the negotiating power of buyers would be strong if they are few in number, if they purchase in large volumes relatively to the suppliers' sales, if their own industry is not competitive, if the suppliers' products are not highly differentiated, if changing from one supplier to another does not imply high switching costs and if the buyers can pose a credible threat of backward integration. As noted by Ballarin (1986), prior to the movement towards deregulation the financial services industry was segmented into relatively insulated compartments with restrictions and limitations being placed upon the financial services products which could be offered by banks, building societies, insurance companies and the other financial intermediaries. The negotiating position of the buyers from the financial services industry has thus traditionally been relatively weak since whilst they were large in number, they could only obtain financial services products from a restricted number of suppliers who offered a limited range of products.

As Collyns and Horiguchi (1984) point out, however, the competitive position of financial intermediaries has changed fundamentally. The authors observe (p.19) that "The rapid pace of innovation in the financial system ... has led to a situation in which a

wide range of institutions vie with each other in offering the customer a great variety of financial products." Canals (1993) confirms that the increase in competition within the financial services industry has increased the number and type of financial services products available to the buyers from the industry thus strengthening their negotiating position. The suppliers' negotiating position has also strengthened as a result of the increasing competition for their funds.

2.2.4.3 The Risk of Substitute Products

Canals (1993) notes that an avalanche of new substitutes for the more traditional banking services products have become available and the author expects that the range of competitors and substitute products will continue to grow in the future. Reviewing developments in the banking industry, Gardener (1990b, p.267) adds that "substitutes for traditional banking products have appeared with increasing frequency."

Fabozzi et al. (1994) remark that there has been a surge in significant financial innovation since the 1960's and ascribe this principally to (a) economic factors such as the increased volatility of interest rates and exchange rates which have stimulated the development of financial products designed to control the risks arising from the increased volatility (b) the greater sophistication of, and competition amongst, financial intermediaries and (c) the advances in ICT.

2.2.4.4 The Degree of Rivalry Existing in the Industry

Oster (1994) points out that the intensity of rivalry within an industry would be expected to be greater the larger the number of competitors in an industry, the more similar their size distribution and the more diverse they are in their strategic behaviour. The intensity of rivalry would also be expected to be greater if the barriers to exit from the industry are relatively high. This would occur if, for example, it is relatively difficult to transfer the assets invested in an industry to another industry since this would encourage firms to remain in, and continue competing in, their original industry even in depressed economic conditions. Finally, variability in demand would increase the rivalry within an industry by increasing uncertainty about the future of the industry and

also by provoking different marketing and organisational responses from the market participants.

Ballarin (1986) argues that the indicators point to an increasing degree of rivalry within the financial services industry. This is because there are a large number of competitors in the industry and also because the strategic behaviour of the competitors is not homogeneous. Llewellyn (1995a, 1995b) adds that the substantial investment in branches made by some banks may become an expensive problem for them in view of the developments in ICT which are radically changing the nature of the links between financial services firms and their customers and reducing the need for banks to operate through branches situated close to their customers. As a result of these developments, it is becoming easier for new entrants to enter into the financial services industry than it is for established firms to exit from the industry since the infrastructural investments made by the latter (in distribution channels, for example), are often greater than those which need to be made by the former to gain entry into the industry.

2.2.4.5 Summary and Conclusions

In this Section, competition in the financial services industry has been analysed in terms of Porter's (1980) framework. The analysis points towards an increasing degree of competition in the industry with consequent pressures being put upon the rate of return earned by the firms operating in the industry. The increasing competition in the industry stems from a reduction in the barriers to entry into the industry primarily as a result of (a) the deregulation of the industry and (b) the fundamental changes in the operating methods of financial services firms brought about by increasingly sophisticated ICT systems which allow new entrants into the industry to bypass traditional ways of operating. Furthermore, whilst a relatively high degree of rivalry between the firms operating in the industry and the availability of substitute products indicate further pressure upon the industry's rate of return, this pressure may be partially alleviated by the relatively low negotiating power of the industry's suppliers and buyers. In summary, it would be expected that the developments in the financial services industry outlined above, whilst making it easier for new players to enter into the industry, have resulted in increased pressures being placed upon the rate of return earned by the participants in the industry. This is confirmed by Schuijer (1992) who observes that the intensification of

competition in the financial services industry has placed increasing pressure upon the profitability of banks.

2.2.5 Effects upon Firms in the Financial Services Industry

The developments in the financial services industry outlined in the preceding Sections have had several effects upon the firms involved in the industry, three of the most important being:

(i) there has been a blurring in the distinction of the roles played by the financial institutions operating in the industry. Kane (1984, p.759) states that "With and without the explicit blessing of specialised financial regulators, deposit institutions, brokerage firms, and insurance companies are feverishly expanding into one another's traditional bailiwick." Johnson (1993) points out that that in the U.S. life insurance companies are also providing mortgage finance whilst investment companies offer accounts that are chequeing accounts for all intents and purposes. She also notes that an effect of the blurring of the roles of financial institutions has been a decline in the importance of banks and other depository institutions whilst the non-depository institutions have grown in importance.

Llewellyn (1995a) states that, as a result of their being squeezed by inroads into their traditional businesses and sharper competition, banks are entering into several new business areas such as insurance and unit trusts. In a later article the author (1995b, p.203) goes further to state that "there is now little that banks do that could not equally be done either by markets, by non-bank financial institutions, or by non-financial banking institutions." He concludes that whilst the demand for banking services will continue to rise, the institutions called banks will not automatically be the suppliers of those services.

(ii) new players have entered into the industry, including a number of non-financial companies. As noted above, for the purposes of this Literature Review, non-financial companies are defined as companies which are involved in the provision of financial services but which derive the major part of their income from other business activities.

Llewellyn (1995b) mentions several non-financial companies which are offering banking, insurance, leasing, credit card and other financial services products. He notes that some large corporate customers have become more credit worthy than their bankers which has resulted in their displacing banks and offering banking services to third parties. In a study of trends in European banking, a report prepared by the Economist Intelligence Unit (1993) notes that non-financial companies are continuing to enter markets which were the traditional domain of banks. The report states that non-financial companies pose a significant competitive threat to banks and considers competition between banks and non-financial companies to be a key driver for change in the financial services industry. Taylor (1999) identifies retail multiples such as Tesco and Marks and Spencer who sell financial services through their branches, and operators such as Virgin and Direct Line who sell financial services directly to their customers through television, direct mail or the internet, as new major sources of competition for banks and insurance companies.

(iii) there has been an increase in the number of financial conglomerates operating in the industry. These are defined by Maycock (1986) as companies whose main business consists of providing a number of different financial services to their customers.

Maycock (1986) observes that financial conglomerates have become major constituents of the financial systems of the U.S. and the U.K. over the past 20 to 30 years and are beginning to do so in other countries as well. He notes that the financial conglomerates first began to develop around the large merchant and deposit banks and that these were followed by other types of financial institutions such as insurance companies. Gardener (1990b) confirms that financial conglomerates are continuing to play a significant role in the financial services industry and notes that their development has been an organisational response to deregulation, intensifying competition and general financial innovation.

2.2.5.1 Summary and Conclusions

A blurring in the distinction of the roles played by the financial institutions operating in the financial services industry, coupled with an increase in the number of financial

conglomerates and non-financial companies operating in the industry, are amongst the most important effects which the developments in the financial services industry outlined above have had upon the firms involved in the industry.

2.2.6 Non-Financial Companies in the Financial Services Industry

Since the focus of this Literature Review is to study one of the developments in the financial services industry noted above, namely the involvement of non-financial companies in the industry, the literature on this topic is next reviewed.

Rosenblum and Pavel (1986) note that one of the earliest works which studied the involvement of non-financial companies in the financial services industry in the U.S. was that carried out by Christophe (1974). This study provided details of the financial services activities of non-financial companies such as General Motors Acceptance Corporation (GMAC), Ford Motor Credit Company (FMCC), General Electric Credit Corporation (GECC) and Sears. The study startled many bankers in the U.S. by pointing out that, for example, Sears earned more money after taxes in 1972 on its financial services business than did any bank or bank holding company in the country.

In their article, Rosenblum and Pavel (1986) trace the historical involvement of non-financial companies in the financial services industry in the U.S. They point out that this is not a new phenomenon, noting that GMAC and Ford began making automotive loans in 1919 and 1928 respectively whilst GECC was formed in 1932 to finance distributor inventories and sales of General Electric products to consumers. Sears began to provide retail credit in 1910 to support its retail operations. The authors add, however, that whilst the entry of non-financial companies into the financial services industry is not a new phenomenon, the pace of entry has accelerated over the years. The non-financial companies which had established financial services interests continued to expand their interests whilst new non-financial companies entered into the field. The non-financial companies accomplished this through the acquisition of existing financial firms or through internal development.

Rosenblum and Pavel (1986) cite several factors as possible explanations of the accelerated entry of non-financial companies into the financial services industry in the

U.S. These include the fact that the non-financial companies were subject to less regulatory constraints than the commercial banks in terms of the geographic areas in which they could operate and also in terms of the financial services products which they could provide which gave them a competitive advantage over the banks. Furthermore, the high interest rates prevalent in the 1970's and 1980's provided an incentive for the purchasers of financial products to consider alternative suppliers of these products to the banks and the other financial institutions which had traditionally supplied them.

Using company annual reports and other sources of data, Rosenblum and Pavel (1986) analyse the financial services activities of 32 U.S. companies chosen on the basis of their being well known as non-banking based competitors of commercial banks. The authors begin their analysis by providing data on the earnings from financial services activities in 1982 of the highest-earning firms in their sample and conclude that the total earnings from these activities of the top 8 companies well exceeded the total earnings of the 9 largest banks in the U.S. The authors proceed to provide details of the financial services activities of the companies in their sample, comparing these to similar financial services provided by the banks where relevant. The main financial services areas in which the sample companies were involved were the provision of consumer good and durable good (including automotive) instalment credit, the provision of business credit and loans, the provision of lease financing and the issuing of credit cards. The authors summarise the outcome of their study by stating (p.205) that "the results indicate that the sheer size and number of nonbank firms with substantial nation-wide financial activities are impressive."

Updating Rosenblum and Pavel's (1986) study, Aguilar (1990) notes that non-financial companies continued to be among the largest providers of a range of financial services in the U.S. The author adds however that the implications of this for the commercial banks had not turned out to be as detrimental as had been predicted. The commercial banks had competed successfully against the non-financial companies in a number of business areas and in some areas the commercial banks had even increased their market share at the expense of the non-financial companies though this appeared to have depressed the commercial banks' profitability. Aguilar (1990) concludes that she expects non-financial companies to continue to offer strong competition to the banks in view of their extensive market penetration and distribution networks.

Leach (1994) studies the involvement of non-financial companies in the financial services industry in the U.S. and Western Europe. The author begins his study by noting that a major characteristic of the financial services industry world-wide is a blurring of the boundaries which used to divide the different types of organisations operating in the industry. The blurring of boundaries is occurring both between financial and non-financial companies and also between the financial companies themselves. Leach (1994, p.7) adds that this trend "has accelerated and promises to accelerate even more rapidly in the second half of the 1990's."

One of the main reasons put forward by Leach (1994) for the existence of this trend is the increasing realisation by the suppliers of financial services products that many similarities exist between these products. Economies of scope may therefore be gained by, for example, utilising existing distribution channels such as bank branches to market other financial services products such as insurance. Also, the information on customers held in existing databases can be used to market alternative products to them. These factors have made it attractive for the suppliers of financial services products to consider broadening their product range and the deregulation of the financial services industry outlined above has allowed them to do this.

Leach (1994) proceeds to put forward the following factors as being the main reasons which may motivate non-financial companies to enter into the financial services industry:

- non-financial companies may seek to build upon their existing customer and/or brand loyalty by also offering financial services products to their customers. Furthermore, the provision of financial services products may itself help to obtain or enhance customer and/or brand loyalty.

- non-financial companies may have established distribution channels such as high-street stores which they can also utilise to distribute financial services products.

Furthermore, due to developments in ICT, it is possible for non-financial companies (and also for financial companies) to dispense entirely with traditional distribution

channels such as branch offices and to utilise electronic methods such as interactive computer terminals and telephones instead. This can both lower distribution costs and also give new entrants into the financial services industry the opportunity to enter the industry without having to establish traditional distribution channels.

- providing financial services products may result in synergies within the non-financial company. Thus, for example, the provision of sales financing may result in increased sales of the non-financial company's core products.

- by offering a financial services product such as a credit card, a non-financial company may substantially improve the level of customer information it holds by, for example, obtaining detailed information on its customers' spending levels and patterns through the card.

- since non-financial companies are less tightly regulated than banks and similar financial companies, the former may have a competitive advantage over the latter in the provision of certain financial services insofar as, for example, they may be required to hold less capital reserves and thus incur lower operating costs.

- entering into the financial services area may represent a diversification opportunity for a non-financial company, allowing it to invest any surplus financial resources and to increase its revenues and earnings.

Such a diversification opportunity may be particularly attractive for a non-financial company whose core business is stagnant or in decline. Entering into the financial services industry may represent an opportunity to diversify into a new business area and achieve growth. Non-financial companies may diversify into the financial services area by setting up their own financial services operation, by acquiring an existing financial services company or by collaborating with an existing financial services company.

Leach (1994) next gives detailed information about a number of non-financial companies and of the financial services areas in which they are involved. The author splits the non-financial companies into three main categories as follows:

- automotive companies such as BMW and Fiat. The main financial services provided by these companies included the financing of automobile sales, leasing, insurance and the provision of credit cards. Some of these companies also offer mortgages and investment management services.

- retailers such as Marks & Spencer and Sears. These non-financial companies were involved in several financial services areas including credit and loan schemes, credit cards, insurance, banking, investment management services and pension schemes.

- non-financial companies which have core business areas other than those noted above. These included companies such as AT&T and BAT Industries whose core business areas were in telecommunications and tobacco respectively. These companies' financial services subsidiaries offer leasing, credit cards, pensions and other financial services.

In some cases, the financial services offered by the non-financial companies relate only to their own products and services whilst in other cases the financial services offered also relate to other companies' products and services. Thus, for example, until recently it was only possible to purchase Marks & Spencer products with a Marks & Spencer credit card whilst AT&T credit cards could be used to purchase a number of suppliers' goods and services.

Lascelles (1999) points out that a number of well-known businesses such as Volkswagen, British Airways and Royal Dutch Shell have entered the financial services industry in recent years. The author points out that, although these companies' market share is still relatively small, their potential for further penetration into the market is high particularly because:

- being new entrants into the industry, they can exploit the latest technology such as the internet to the full. They can thus, for example, reach the market without having to set up expensive branch networks.

- coming in from outside the industry, they bring in fresh ideas on products, marketing and pricing. Thus, for example, in the banking area the new entrants tend to offer more competitive interest rates than the traditional banks.

- customers for financial services products are increasingly willing to shop around amongst different suppliers of these products and to procure the products from new suppliers, particularly if they already know and trust the supplier's brand name.

2.2.6.1 Summary and Conclusions

The entry of non-financial companies into the financial services industry is not a new phenomenon and in the case of some companies goes back to the early part of the last century. Several reasons have been adduced for this including the fact that non-financial companies were subject to less regulatory constraints than the commercial banks in terms of the financial services products which they could offer and (in the U.S.) the geographic areas in which they could provide them. The pace of entry of the non-financial companies into the financial services industry has accelerated in recent years, the deregulation of the industry and developments in ICT being amongst the major factors which have influenced this trend. Industry analysts surmise that the exploitation of synergy and economies of scope are two of the main factors which have motivated non-financial companies to diversify into the financial services industry. The analysts also observe that non-financial companies' earnings from their financial services activities appear to be comparable with the earnings of specialist financial services firms in the industry.

SECTION 2.3: DIVERSIFICATION

2.3.1 Introduction

Since non-financial companies which enter into the financial services industry are engaged in a diversification exercise, the literature on diversification is reviewed in this Section to provide a theoretical basis for the study of this phenomenon. After defining the term "diversification" in Section 2.3.2, the theoretical reasons for diversification are discussed in Section 2.3.3. Section 2.3.4 then considers the different methods of diversification (internal development, merger and acquisition and strategic alliances) whilst the measurement of diversification is discussed in Section 2.3.5. Finally, a number of empirical research studies investigating the links between diversification and performance are reviewed in Section 2.3.6 and the research on the issue is summarised and critiqued.

2.3.2 Definition of Diversification

Ramanujam and Varadarajan (1989) note that diversification has a rich tradition as a topic of research. They point out that the topic has been examined by researchers in several disciplines including business history, economics, management, finance, law, marketing and public policy. The authors observe that a great deal of variation exists in the way that diversification is conceptualised, defined and measured in the literature.

Whilst some authors (Pitts and Hopkins (1982), Grant et al. (1988)) focus on the extent to which a firm is diversified in their definition of diversification, others (Ansoff (1965), Johnson and Scholes (1993)) emphasise the activities involved in diversification. Thus, Pitts and Hopkins (1982) define diversification as the extent to which firms operate in different businesses simultaneously whilst Ansoff (1965) defines it as the entry of firms into new markets with new products. For the purposes of this Literature Review, diversification is defined as taking place when a firm or business unit enters into new lines of activity which are sufficiently different to its existing lines of activity to imply

some significant difference in the firm's production or distribution processes. The term "diversity" will be used to describe the extent to which a firm is diversified.

A firm may engage in related or unrelated diversification. Related diversification is defined as a form of diversification which builds on a firm's existing assets or activities whilst in unrelated (or conglomerate) diversification there is no close relationship between a firm's new activities and its existing assets or activities. Diversification may take place by means of internal development, merger and acquisition or strategic alliance. Finally, vertically integrated firms are defined as firms which are involved in various stages in the production and distribution of particular end-products.

2.3.3 Reasons for Diversification

Several reasons for diversification are put forward in the literature on the subject and reviewing these reasons, Reed and Luffman (1986) observe that whilst the benefits offered by diversification are substantial, so too are the problems. McDougall and Round (1984) carried out a research study in Australia which highlights some of the reasons which motivate firms to undertake diversification programmes. The main reasons for diversification put forward by a sample of 63 diversified industrial companies included dissatisfaction with the profitability of traditional investments, poor growth prospects in traditional markets, reducing the firm's risks, the existence of suitable opportunities for diversification and strong cash flow from traditional activities. These and other reasons for diversification are now discussed.

2.3.3.1 Rate of Return

A fundamental objective of many business firms is to maximise the rate of return they obtain on the capital invested in the firm. Business firms may adopt different strategies to achieve this objective, one of which is to diversify their activities. Thus, Ansoff (1965) points out that a firm may take up an opportunity to diversify because it believes that the rate of return that it can earn from the activities into which it plans to diversify is greater than the rate of return it is earning from its existing activities. Also, a firm may not be achieving its rate of return objectives through its existing activities due, for example, to declining or saturated markets for its current products and in such

circumstances the firm may seek to diversify into other activities through which it believes it can achieve its rate of return objectives.

2.3.3.2 Resources

To achieve its rate of return objectives by diversifying into new activities, a firm would need to have, or be in a position to obtain, the resources it requires to carry out its diversification programme. It is also argued, however, (Chatterjee and Wernerfelt (1991)) that the resources possessed by a firm may themselves provide a rationale for the firm's diversification and they may also indicate the type of diversification the firm should undertake and the extent to which it should diversify. Indeed, in view of the rapid changes which have been occurring in many firms' business environment, some authors (for example Grant, (1991)) hold that firms should take a 'resource based' view of strategy and formulate their strategies on the basis of the resources and capabilities they possess rather than on the basis of external market factors.

Amongst the more powerful reasons put forward for diversification are that this strategy can result in a better utilisation of a firm's resources through the exploitation of synergy and economies of scope. Synergy is defined by Johnson and Scholes (1993, p.229) as a situation where "two or more activities or processes complement each other to the extent that their combined effect is greater than the 'sum of the parts'". Oster (1994) adds that economies of scope arise when the costs of production of two lines of business run together are less than the sum of each run separately. Economies of scope may thus be seen as a specific case of synergy, expressed in a cost context. Panzar and Willig (1981) observe that economies of scope arise in circumstances where certain resources possessed by a firm such as its top management and its distribution channels, whilst only being available in units of a certain minimum size, can be utilised in the production of more than one product line. If these resources are not being used to their full capacity to produce the firm's current product lines, diversification by the firm into new product lines would result in a fuller utilisation of the resources without a corresponding increase in the firm's costs. The costs of producing the current and the new product lines together would thus be less than the sum of the costs of producing them separately. Teece (1980, 1982) points out that whilst an organisation may be in a position to reap economies of scope by diversifying into new product lines, this does not necessarily

mean that the organisation must itself produce the new product lines. A firm may instead sell or lease its surplus productive capacity to other firms but it would be dissuaded from doing so if the existence of transactions costs make this course of action unprofitable. Transactions costs are discussed in further detail in the following Section.

Economies of scope may arise from a firm's tangible resources, from its intangible resources or from its managerial and organisational capabilities (Grant 1998). Thus, economies of scope may be reaped if a firm's tangible resources such as its distribution networks, research facilities and information technology systems are not being used to their full capacity to produce the firm's current product lines and can be shared by new business lines. Similarly, intangible assets such as a corporation's reputation, brand names and the knowledge it possesses about its markets, customers, operations etc. can be transferred from one business activity to another with economies of scope again being derived through the more intensive use of these assets. Finally, economies of scope may be gained if a diversified company's managerial and organisational capabilities are utilised to manage both its current and its new operations. In this respect, Williamson (1975) argues that managerial efficiencies may arise as a result of diversification due to the fact that diversified firms are likely to have multidivisional (M-form) structures which the author hypothesises to be more efficient than unitary (U-form) structures. This is because in the M-form organisation a level of management is created which is concerned with the co-ordination of specialised divisions and this would be expected to improve a firm's internal operating efficiency by assigning responsibility for operating decisions to the divisions whilst allowing central management to concentrate upon strategic issues and upon co-ordinating the allocation of financial and other resources within the organisation.

As noted above, Chatterjee and Wernerfelt (1991) argue that the nature of the resources possessed by a firm determines the type of diversification strategy which a firm should undertake. The authors point out that, whilst some resources can be used to produce only one end-product, most resources can be used to produce more than one end-product. Defining the former type of resources as "inflexible" and the latter type as "flexible", Chatterjee and Wernerfelt (1991) hypothesise that if a firm's resources are predominantly inflexible, it would be constrained to diversify in a relatively related manner whereas if its resources are predominantly flexible, the firm would have the

option of diversifying in a related or in an unrelated manner. The authors classify firms' resources into three main types, namely physical resources and intangible assets, both of which they consider to be relatively inflexible, and financial resources which they consider to be relatively flexible. Chatterjee and Wernerfelt (1991) thus hypothesise that when firms possessing high levels of physical resources or intangible assets diversify, they would tend to do this in a related manner whereas firms which possess high levels of internal funds would tend to diversify in an unrelated manner. The authors carried out statistical tests on a sample of 118 firms on the basis of which they conclude that the evidence supports their hypothesis insofar as the firm's intangible and financial resources appear to be the dominant factors in explaining the type of diversification it chooses.

Prahalad and Hamel (1990) stress the importance of an organisation's human resources, arguing that in the long run the key to a company's competitiveness lies in the ability of its management to identify, consolidate and build upon the firm's core competencies. The authors consider an organisation's core competencies to consist of the collective learning in the organisation and point out that the distinguishing characteristics of these competencies are that (a) they provide potential access to a wide variety of markets (b) they make a significant contribution to the benefits which customers derive from the firm's end products and (c) it should be difficult for competitors to imitate them. Hoskisson and Hitt (1990) concur, arguing that diversification can succeed only when a firm can capitalise on some core skill or distinctive competence which it can transfer to the activities into which it diversifies.

2.3.3.3 Transactions Costs

A further reason for diversification is that this strategy may lead to a reduction in a firm's transactions costs. Grant et al. (1988) point out that specialised firms incur transactions costs such as the costs of negotiating and enforcing contracts when they interact with the market in order to obtain their supplies, sell their output, recruit their employees and so forth. By creating an internal market for some or all of these transactions, diversified firms may be able to reap efficiencies by reducing their transactions costs and also by making better resource allocation decisions due to their more intimate knowledge of the resources they utilise. Grant (1995) provides an

example of these efficiencies when he observes that it may be financially more advantageous for a firm to utilise the funds it generates internally, rather than the funds available on the outside capital market, for investment purposes since the transactions costs involved in using the former are likely to be lower than the transactions costs involved in using the latter. Furthermore, Williamson (1975) observes that a firm's management would be able to allocate financial resources amongst its different business activities more efficiently than an external capital market could since the management would have more information about, and greater control over, the firm's activities. Stein (1997) adds that a firm's headquarters can create value in this respect by picking the winners and losers from amongst the projects competing for the firm's scarce financial resources. Thus, a firm may thus choose to diversify in order to take advantage of the financial efficiencies it could reap by utilising its internally generated funds.

2.3.3.4 Risk Reduction

A further reason put forward for diversification is that a firm would reduce its risks by undertaking this strategy. It is argued (Oster (1994)) that a firm's earnings may fluctuate over time for various reasons such as changes in the level of economic activity in its home country and/or internationally and changes in the level of competition in the industry in which it operates. Thus, by diversifying into lines of business activity whose earnings are not perfectly correlated with each other, the firm's risks, defined in this context as the variability of its earnings, would be expected to reduce. This is because lower earnings in one business activity could be partly or wholly offset by higher levels in another. It may thus be expected that 'pure' conglomerate diversification, namely diversification which has no effect upon a firm other than to reduce the variability of its earnings by combining business activities whose earnings are not perfectly correlated, would result in an increase in the market value of the firm's shares. However, this expectation is not supported either by theoretical considerations or by empirical research.

The risk-return model in finance theory holds that, the higher the risks associated with the income stream derived from a particular security, the higher the rate of return which rational investors would expect to earn from that security (Salter and Weinhold (1979), Bodie et al. (1993)). Rational investors would be expected to select those securities

whose risk-return profile is most favourable, namely those which provide the highest rate of return at a given level of risk or the lowest risk at a given rate of return, such investments being known as 'efficient' investments. If both the rate of return which investors expect to earn from a security and the income stream which the security is expected to generate are known, then the expected price of the security can be determined by discounting the expected income stream at the expected rate of return. A reduction in the risks associated with a particular security's expected income stream would then lower the rate of return investors expect to earn from the security and thus raise its price, and vice versa.

Extending the risk-return model, the Capital Asset Pricing Model (CAPM) considers the risks associated with a firm's securities to be made up of two components, namely systematic risk (beta) and unsystematic risk (alpha). Unsystematic risk is that portion of total risk which is specifically related to a firm's activities and which a firm can therefore partially or wholly eliminate by the strategies it implements such as diversification. Systematic risk, on the other hand, is that portion of total risk which arises from macroeconomic and other market-related factors and which is thus correlated with the risk of all the other securities on the market. Although a firm can reduce the level of its unsystematic risk by diversifying its activities, it is argued (Levy and Sarnat (1970)) that investors can themselves hedge against this type of risk equally efficiently by diversifying their portfolio of securities and in the CAPM unsystematic risk is not therefore held to play any part in the determination of the price of a firm's securities. Rather, under certain assumptions about investor expectations and market efficiency, the CAPM holds that the rate of return used to discount the income stream expected from a security to establish its price should be determined by adding a premium for the security's systematic risk to the risk-free rate of return, the latter usually being the rate of return on Government securities. On the basis of these arguments, whilst 'pure' conglomerate diversification may reduce the level of a firm's unsystematic risk, this would have no effect upon the market value of its shares since this is only influenced by the level of the firm's systematic risk.

Although some criticism has been levelled at the CAPM, particularly because it is based on perfect market assumptions such as that investors act rationally and also because, as discussed in further detail in Section 3.4, the empirical evidence indicates that beta may

not capture all the elements of market risk, the model nevertheless remains a key analytical tool in modern finance theory (Mills (1994)). Relaxing two of the CAPM's assumptions, namely that there are no bankruptcy costs and that there are no differential tax rates, Lewellen (1971) demonstrates that a reduction in the variability of a firm's earnings would lower the probability of its eventual bankruptcy and thus increase the amount that lenders are prepared to lend to the firm. Since interest expenses are tax deductible, the firm would pay less tax and thus the firm's shareholders would benefit more through the firm's diversification than they would have benefited by diversifying their own portfolios. Whilst Lewellen's (1971) arguments may thus appear to indicate that 'pure' conglomerate diversification can positively affect the market value of a firm's shares, Alexander et al. (1993) point out that an increase in the amount of debt carried by a firm would also have a negative effect on the market value of its shares. This is because, due to the need to make interest payments, an increase in the amount of debt a firm carries would increase the volatility of the earnings of its shareholders and thus increase the level of risk associated with their shares, thus reducing their market value.

2.3.3.5 Market Power

A further reason put forward for diversification is that a firm may increase its power to co-operate or to collude with other firms if it operates in more than one industry. It is argued (Palepu (1985)) that, due to the greater market power possessed by diversified firms, these firms can achieve higher, and relatively lower-risk, profits than can be achieved by less diversified firms due to their ability to subvert competitive market forces through measures such as cross-subsidisation, reciprocal buying and selling and predatory pricing. In the first case, the revenues a firm earns from one product line would support the activities relating to another product line whilst in the second case a firm's actual or potential customers would also be its actual or potential suppliers. Predatory pricing occurs when the revenues earned from some product lines subsidise the low prices of other product lines or when short-term losses are offset by gains from future higher prices.

An alternative view is put forward by Montgomery (1985), however, who argues that highly diversified firms are likely to have significantly lower, rather than higher, market

power in their respective markets. This is because these firms would lack the specialist management skills and the commitment to invest in specialised assets which may be necessary to capture a competitive position in certain markets. Montgomery (1985) notes that Caves et al. (1980) found that diversifying firms did not tend to enter into the most profitable markets, presumably because the barriers to entry into these markets are relatively high. Rather, diversifying firms tend to enter into markets which have relatively low entry barriers, moderate seller concentration and profit levels below those of the most profitable markets. Montgomery (1985) thus hypothesises that the markets of highly diversified firms would be less profitable, and have lower seller concentration levels, than the markets of less diversified firms. To test her hypothesis, the author carried out statistical tests on data relating to a sample of 128 firms over a six-year period and found that the evidence supported her hypotheses. Montgomery (1985, p.795) thus concludes that "highly diversified firms in general have low, not high, market power".

Referring specifically to vertical integration, Oster (1994) suggests that firms may undertake backward integration in order to assure their sources of supply whilst forward integration may help firms to assure the outlets for their products. The author also notes that a firm may choose to undertake *partial* vertical integration whereby it carries out a limited amount of backward or forward integration in order to obtain first-hand information on and experience of its suppliers' or customers' activities and thereby be in a better position to understand their requirements and to negotiate with them.

2.3.3.6 Managerial Motives

Amihud and Lev (1981) put forward an alternative explanation of the phenomenon of conglomerate diversification based on Jensen and Meckling's (1976) agency theory framework. Amihud and Lev (1981) note that the empirical evidence does not indicate that any significant benefits accrue to the firms which undertake conglomerate diversification or to the shareholders of these firms. The authors thus hypothesise that a possible explanation of the phenomenon stems from managers' desire to reduce the risks associated with their employment by their firms. Amihud and Lev (1981) argue that managers' income from their employment generally constitutes a major portion of their total income and the level of this income is often linked to their firm's

performance. Managers may therefore seek to implement strategies which will reduce their firm's risks and consequently reduce their own income and employment risks. Thus, managers may engage in conglomerate diversification to stabilise their firm's income stream in order to reduce the risks of fluctuations in their own incomes and also to reduce the risks of their firm's bankruptcy which would result in the loss of their employment. The interests of the stockholders and those of the managers may sometimes conflict, however, and the strategies which are actually implemented depend upon the degree of control which the stockholders can exercise upon managers' decisions.

To test their hypotheses, Amihud and Lev (1981) took a sample of 309 U.S. firms and, depending on the percentage of stock held by particular individuals or groups, categorised the firms into owner-controlled and management-controlled firms. The authors found (a) that the management-controlled firms had undertaken significantly more conglomerate acquisitions than the owner-controlled firms and (b) that the operations of management-controlled firms were more diversified than those of owner-controlled firms; Amihud and Lev (1981) thus conclude that the evidence supported their hypotheses. This conclusion was challenged by Lane et al. (1998) who argued that the evidence they collated showed that ownership structures had a negligible effect upon the strategic decisions taken by firms but this critique was rebutted by Denis et al. (1999) who, using a larger sample than Lane et al.'s (1998), corroborated Amihud and Lev's (1981) findings.

Apart from seeking to reduce their firm's risks to protect their own employment, it may also be in the managers' interest for their firm to grow since this would provide them with greater career prospects. Several authors (Teece (1982), Reed and Luffman (1986)) note that diversification is often considered to be a way of promoting growth, particularly by firms operating in mature industries which are growing slowly. Whilst agreeing that a firm's diversification may be motivated by the interests of its management, Hoskisson and Hitt (1990) point out that various governance mechanisms exist to discourage such action. These include the presence of outside directors on a company's board, the linking of executive compensation to a firm's performance and the threat of takeover if a firm's performance is poor.

2.3.3.7 Taxation

As previously noted, since interest payments are tax deductible, the increased debt capacity of diversified firms may reduce their tax burden compared to that of undiversified firms. Furthermore, Oster (1994) points out that, in cases where different parts of the production and distribution chain are taxed at different rates, a firm which is vertically integrated may be in a position to reduce its tax burden by shifting its profits to that part of the chain which is taxed at a relatively low rate.

2.3.3.8 Problems of Diversification

Reviewing the problems which may arise from diversification, Berger and Ofek (1995) note that these include the possibility that, because diversified firms may have greater borrowing power and therefore more funds available for investment than undiversified firms, the former firms may tend to invest in lower net present value projects than the latter firms. Also, diversified firms may be inclined to subsidise unprofitable lines of business by the profits generated from their profitable lines, thus reducing their overall level of profitability. Furthermore, communications problems may arise between corporate management and divisional management in diversified firms. Grant et al. (1988) add that a firm's profitability may decline as its degree of diversification increases due to the strain which may be imposed upon corporate management as it seeks to manage an increasing number of diverse businesses. As discussed in further detail below, problems may also arise when it is attempted to integrate a firm's existing activities with its new activities (Kitching (1967), Shrivastava (1986)).

2.3.3.9 Summary and Conclusions

Several factors which may motivate a business firm to diversify its activities have been discussed in this Section. The most powerful reasons for undertaking this strategy appear to be the exploitation of economies of scope and the reduction of transactions costs since, as discussed in Sections 2.3.3.2 and 2.3.3.3, these factors can result in an improvement in a firm's profitability and can thereby lead to an increase in the market value of the firm's shares. Other reasons which have been put forward in favour of diversification include the reduction of risk and an increase in the firm's borrowing

power although, as discussed in Section 2.3.3.4, theoretical considerations indicate that neither of these factors would be expected to affect the market value of the firm's shares. A firm's diversification strategy may also be motivated by the desire of its managers to improve their career prospects and job security and the effect of this upon the market value of the firm's shares depends upon the nature of the diversification strategy which is implemented. As discussed in Section 2.3.3.5, a diversification strategy may result in an increase in a firm's market power though whether or not this would lead to an improvement in the firm's profitability is arguable. A firm's resources, and particularly its distinctive competencies, have been argued to be of critical importance in the successful implementation of its diversification strategy.

It may be argued that some of the benefits of diversification described above are more likely to arise from a strategy of related diversification whilst others are more likely to result from a conglomerate diversification strategy. Thus, a firm would be more likely to achieve economies of scope if it diversifies into business activities which are closely related to its existing activities since this would facilitate the utilisation of the firm's existing resources in the production and distribution of the new products or services. Also, by substantially reducing the number of transactions a firm makes with its suppliers and/or with its customers, vertical integration is likely to reduce a firm's transactions costs and foster the development of an internal market to a greater extent than the other forms of diversification would. On the other hand, a firm seeking to diversify in order to reduce its management's employment risks, increase its borrowing capacity or reduce its tax burden is likely to select a strategy of conglomerate diversification. However, as Palich et al. (2000) point out, the benefits which would be expected to arise from a strategy of unrelated diversification would also be expected to arise, albeit to a more limited extent, from a strategy of related diversification. Whichever form of diversification is selected, severe problems may arise in the integration of the firm's existing activities with its new activities and in the management of the enlarged organisation and these factors may explain why, as discussed in further detail below, the empirical research has not conclusively substantiated the theoretical expectations of the benefits which can result from diversification.

2.3.4 Methods of Diversification

Ramanujam and Varadarajan (1989) state that the polar extremes in the choice of diversification method are internal growth versus acquisition-based growth. Other methods of diversification such as licensing, joint ventures and strategic alliances fall between the two extremes though a mixing of methods is also possible. Johnson and Scholes (1993) concur with this analysis and suggest that there are three main types of diversification method, namely (a) internal development, (b) mergers and acquisitions and (c) strategic alliances. The latter may be loose or formalised arrangements between organisations and may take the form of joint ventures, consortia and franchising amongst others.

2.3.4.1 Internal Development

Johnson and Scholes (1993) argue that internal development may be the most advantageous diversification method for a firm because it would provide the firm with the opportunity to obtain first hand knowledge and experience of the product-market area into which it is diversifying. The authors also point out that an advantage of this method of diversification compared to merger and acquisition is that it allows a firm to spread the costs of diversification over a longer time period than would be the case if it acquired another company. Furthermore, it may be easier to integrate a firm's new activities with its existing activities if it diversifies through internal development rather than through merger and acquisition since (a) the new activities can be designed to fit as well as possible with the existing activities, (b) diversification through internal development would allow a firm more time to integrate the new activities with the existing activities and (c) the behavioural and cultural problems which may arise when it is attempted to integrate one firm with another would be avoided.

2.3.4.2 Merger and Acquisition

Strictly speaking, a merger occurs when all the assets and liabilities of an acquired company are absorbed by the buying company such that the two become one legal entity. The term "merger" or "merger and acquisition" is however often used in the literature on the subject in a wider sense to refer to any union between two or more

firms and this usage will also be adopted in this Literature Review. "Merger" or "merger and acquisition" will henceforth be termed "M & A" in the Literature Review. Brealey and Myers (1991) describe three different ways in which M & A may take place. Firstly, as already noted, the buying company may absorb all the assets and liabilities of the acquired company. Secondly, the acquiring firm may purchase the shares of the acquired company and thirdly the buying company may purchase some or all of the assets of an existing firm.

M & A suffers from certain disadvantages compared to internal development as a method of diversification. Acquiring firms often pay a substantial premium for the purchase of an acquired company's assets or shares and once a firm is acquired, difficulties may arise in integrating the operations of the acquired firm with those of the acquirer. In spite of these factors, however, M & A has remained a popular method of diversification. Thus, Porter (1987) points out that 70% of the diversification of 33 large U.S. companies he sampled was accomplished through M & A. Various possible gains from M & A may offset the negative factors noted above and lead firms to choose the M & A route, rather than the internal development route, as their diversification method and these gains include (Copeland and Weston (1992), Oster (1994)):

- M & A between erstwhile competitors may lead to an increase in the market power of the merged firms, particularly if relatively few firms operate in their industry.

- a firm may enter into a new business area more rapidly through M & A rather than through internal development. Similarly, it may be easier to enter a foreign market through M & A rather than by setting up a new venture in that market.

- a firm may choose to enter into a new business area by acquiring an existing company, rather than through internal development, if an expansion in the industry's capacity is undesirable because, for instance, the level of demand is static.

- a firm may seek to acquire the shares of another company if it considers the share price of the other firm's shares to be below their real value. Similarly, a firm

may decide to acquire another firm if it believes that it can improve its performance after acquiring it and thus raise its share price.

- if the tax system allows a firm's losses to be offset against its profits, a profitable firm may merge with a firm carrying tax losses in order to reduce its overall tax burden.

In spite of the popularity of M & A , the failure rate for this type of activity is high and one of the main reasons for this is that the acquirer typically knows less than the seller about the firm it is acquiring (Oster, 1994). Thus, after a firm is acquired, unexpected facts may be discovered about it which may lead the acquirer to divest itself of the acquisition. Shrivastava (1986) adds that difficulties may arise when it is attempted to integrate an acquired firm with the acquiring firm. These difficulties would be expected to be less acute if the cultural fit between the two firms is good, if there is not much difference in the size of the two firms and if the various stakeholders are provided with sufficient information with respect to the likely impact of the acquisition upon their interests.

Kitching (1967) carried out a study which investigated the outcome of 69 acquisitions made by 20 U.S. companies between 1960 and 1965. Based on interviews with the companies' management and on the companies' financial results, the author found that whilst most of the acquisitions were of the conglomerate type, a high proportion of the acquisitions which subsequently failed were also in this category. The main reasons cited by Kitching (1967) for the failure of 19 of the acquisitions he studied were (a) size mismatches between the acquired and the acquiring firms - in many instances the acquired company was much smaller than the acquiring company and insufficient attention was paid by the acquiring company to the acquired company after the acquisition (b) inappropriate organisational and reporting structures being established between the acquired company and the acquiring company and (c) difficulties in obtaining any real synergies through the merger of the acquired and the acquiring firms.

To ensure that acquisitions succeed, Kitching (1967) points out that it is essential (a) that the combined management competencies of the acquired and of the acquiring firms are sufficient to successfully handle the changes involved in merging the two companies

(b) that appropriate reporting relationships between the acquired and acquiring companies are set up immediately after the acquisition (c) that the acquisitions made by acquiring companies are part of an overall strategy which includes an acquisition programme, rather than a reaction to an opportunity to purchase a company; furthermore the criteria to be used when acquiring a company should be rigorously defined and applied and (d) that realistic assessments of a potential acquisition's funding, managerial and other resource requirements should be made before the acquisition.

2.3.4.3 Strategic Alliances

Oster (1994) defines a strategic alliance as an arrangement in which two or more firms combine resources outside of the market place for a period of time in order to accomplish a particular task or set of tasks. The author notes that this method of diversification has been used with increasing frequency since the early 1980's. Strategic alliances may take a number of forms which may or may not involve equity participation by the firms forming the alliance. In a joint venture, a separate entity is set up in which the firms making up the alliance have equity rights and to which they each transfer resources. In some alliances, firms may purchase a minority interest in each other. On the other hand, strategic alliances may also be formed through licensing and similar agreements which do not involve a sharing of equity.

Oster (1994) also points out that whilst strategic alliances vary in their duration, they typically last for around five years. In some cases, a dissolution date for the alliance is set in the original contract whilst in others it occurs once a specific goal is reached. The original contract may also contain the conditions under which the strategic alliance may be renewed. The author adds that the main advantage strategic alliances have over the other methods of diversification is that they are more flexible and easier to set up or to dissolve than the other methods. Strategic alliances have thus been particularly common in high-technology industries where speed and flexibility in forming new combinations of resources are important due to the rapidity with which changes in technology occur in these industries. Several strategic alliances have also been formed between firms seeking to enter markets in foreign countries and local firms already operating in those

countries. Such alliances allow a firm to penetrate a foreign market more rapidly than it is otherwise likely to.

2.3.4.4 Summary and Conclusions

Internal development, merger and acquisition (M & A) and strategic alliances have been identified as the main vehicles through which firms implement diversification strategies. Whilst a firm may enter into a new business area more rapidly through M & A than through internal development, the latter strategy would generally allow the firm to spread its diversification costs over a longer time period and it would also facilitate the integration of the firm's new activities with its existing activities. The main advantage strategic alliances have over the other two methods of diversification is that they are more flexible and easier to set up or to dissolve than the other methods. Whichever diversification method is chosen, particular attention must be paid to the behavioural and cultural problems which may arise when a firm's new and existing activities are integrated, to ensure that the diversification strategy is successful.

2.3.5 Measurement of Diversification

The measurement of a firm's diversity (i.e. the measurement of the extent to which a firms is diversified) is an important element in the research studies which have been carried out on diversification. Pitts and Hopkins (1982) point out that researchers have used two main methods to measure diversity, namely business count measures and strategic measures. The authors observe that the business count measures are more appropriate for investigating differences between diversified and nondiversified firms whilst the strategic measures are more useful for studying differences among diversified firms.

Business count measures vary in their level of sophistication, ranging from simple counts of the number of businesses in which a firm is involved to more sophisticated measures, such as the 'entropy' measure proposed by Jacquemin and Berry (1979), which give due weight to the relative size of the different businesses in which a firm is involved. Business count measures typically use the Standard Industrial Classification

(SIC) codes to identify the businesses in which a firm is involved and thus provide a relatively objective method of measuring diversity.

The strategic measures focus on the degree of relatedness that exists between the resources of a firm's different businesses or on the method of diversification (internal development or M & A). The former type of measure was developed by Rumelt (1974) who categorised firms into four major groupings (single business, dominant business, related business and unrelated business). When this type of measure is used, a substantial amount of research into the nature of a firm's activities, as well as a substantial amount of subjective judgement, is necessary to determine how to categorise each firm. When the latter type of measure is used, it is generally implicitly assumed that internal development generates businesses that are more closely related than would be the case when diversification occurs through M & A.

The categorisation scheme proposed by Rumelt (1974) was used in several subsequent research studies on diversification. Grant et al. (1988) note that Rumelt had a pioneering role in this respect and state that in his 1974 work Rumelt "set the pattern for subsequent research by developing a taxonomy of diversification strategies." In view of the importance of Rumelt's (1974) work for subsequent research, a detailed description of his categorisation scheme is next presented.

In his 1974 work, Rumelt distinguishes between vertically integrated and nonvertically integrated firms. The former are defined as firms whose major activities consist of stages in the sequential processing of particular materials from their raw form to a finished product or products. Nonvertically integrated firms are classified by Rumelt (1974) into four broad categories which are:

- "single business", namely firms which are basically committed to a single discrete business activity from which they derive 95% or more of their revenue. (Discrete business activities are defined as business activities [or product-market activities] which are independent of a firm's other business activities insofar as basic changes can be made in their nature and scope without materially affecting the other business activities.)

- "dominant business", namely firms which have diversified to some extent but still obtain the preponderance of their revenues (between 70% and 95%) from a single discrete business activity. These firms are further subdivided into "dominant constrained", "dominant linked" and "dominant unrelated" categories.

In "dominant constrained" firms, the preponderance of the diversified activities are related to each other and to the dominant business. In "dominant linked" firms, the preponderance of the diversified activities are again related to each other but not to the dominant business. Finally, in "dominant unrelated" firms, the preponderance of the diversified activities are unrelated to the dominant business or to each other.

- "related business", namely diversified firms which (a) derive less than 70% of their revenue from a single discrete business activity and (b) have accomplished diversification by relating new activities to old such that at least 70% of their revenue is attributable to a group of business activities that were originally related in some way to one another. This type of firm may be "related constrained" or "related linked".

"Related constrained" firms are those in which each business activity is related to almost all of the other business activities whilst "related linked" firms are those which added new activities to old in such a way that the businesses in which they were eventually involved were virtually unrelated to each other.

- "unrelated business", namely diversified firms which also derive less than 70% of their revenue from a single discrete business activity but in which less than 70% of revenue is attributable to a group of business activities that are related in some way to one another. These firms would have diversified without much regard to the relationship between their current activities and their new businesses.

A further sub-division of these firms is made into two categories, namely "unrelated business" and "conglomerate." "Conglomerate" firms are those which have aggressive programmes for the acquisition of new unrelated businesses whilst "unrelated businesses" are those which do not qualify as conglomerates.

In Rumelt's (1974) classification, vertically integrated firms are placed in the "single business" category if 95% or more of their revenue is derived from a single end product. They are placed in the "dominant business" category (and termed "dominant vertical") if at least 70% of their revenue is derived from the sale of the intermediate and end products associated with the vertical chain but none of the end products contributes 95% or more to the firms' revenue. Finally, vertically integrated firms which derive less than 70% of their revenue from the sale of the intermediate and end products associated with the vertical chain are classified as "related businesses" or "unrelated businesses" according to the criteria noted above.

In a subsequent work, Rumelt (1982) removed the sub-divisions in the "unrelated business" categories and merged the "dominant linked" and "dominant unrelated" sub-categories into a "dominant linked-unrelated sub-category."

2.3.5.1 Summary and Conclusions

Researchers have used two main methods to measure the extent to which a firms is diversified, namely business count measures and strategic measures. Business count measures rely on classifications such as the Standard Industrial Classification (SIC) codes and thus provide a relatively objective method of measuring diversity. The strategic measures often follow Rumelt's (1974) categorisation scheme and require a substantial amount of subjective judgement. Business count measures are more appropriate for investigating differences between diversified and nondiversified firms whilst the strategic measures are more useful for studying differences among diversified firms.

2.3.6 Diversification and Performance

Several empirical research studies have attempted to measure the degree of success achieved by organisations in diversifying. The studies which are most relevant to the topic of this Literature Review are those carried out within the 'strategy' and within the 'finance' disciplines and these will now be reviewed. The strategy studies generally attempt to determine whether a link exists between the extent to which firms diversify and their financial performance and Rumelt's (1974) classification scheme is often used

to measure diversity. The finance studies, on the other hand, are mainly concerned with determining whether M & A or conglomerate diversification result in any quantifiable benefits to the firm or to its shareholders. In the following Section, the empirical research studies carried out in the strategy area are reviewed first, followed by those carried out in the finance area on M & A and on conglomerate diversification.

2.3.6.1 'Strategy' Studies

As previously noted, Rumelt's (1974) investigation into the relationship between diversification and performance was a path-breaking study in the field. In his study, Rumelt took a random sample of 100 companies from lists of the 500 largest industrial companies in the U.S. in 1949, 1959 and 1969 and classified them into one of the nine categories noted in Section 2.3.5 above. The author also selected ten financial variables such as ROE (after-tax return on equity) by which to measure the performance characteristics of the firms in each of the nine categories. The relevant data was sourced from the Compustat data base. The mean values of the ten financial variables for each of the nine categories were then calculated and t tests and F tests were carried out to determine whether the differences between the category means were statistically significant. The results indicated that the categories into which the firms were divided did in fact exhibit significant and consistent differences in financial performance. Thus, the best overall performers were the dominant constrained and the related constrained groups of firms, both of which had diversified by building upon some central strength or competence. The lowest performance levels were those of the dominant vertical and unrelated business groups whilst the single business, related linked and conglomerate groups exhibited medium performance levels.

Commenting on his 1974 work, Rumelt (1982, p.359) states that "it was...found that corporate profitability differed significantly across groups of firms following different 'strategies' of diversification. The highest levels of profitability were exhibited by those having a strategy of diversifying primarily into those areas that drew on some common core skill or resource. The lowest levels were those of vertically integrated businesses and firms following strategies of diversification into unrelated businesses." Johnson and Scholes (1993) comment that Rumelt's 1974 work showed that firms which developed

through related diversification outperformed both those which remained specialised and those which developed through unrelated diversification.

Using Rumelt's (1974) methodology, Bettis (1981) examined performance differences between related and unrelated firms over a five-year period. The sample of firms studied by the author included 31 related constrained firms, 24 related linked firms and 25 unrelated business firms and to measure performance Bettis (1981) utilised the Return on Assets (ROA) ratio. The author's analysis led him to conclude (p.389) that "on the average related diversified firms outperform unrelated diversified firms by about one to three percentage points of return on assets", thus supporting Rumelt's (1974) observations.

Following Christensen and Montgomery's (1981) observations that Rumelt's (1974) study may not have taken sufficient account of the effects of industry participation, the latter author sought to replicate his earlier work using a larger sample and more detailed data. A sample of 273 corporations was chosen from amongst the largest 500 industrial corporations in the United States as listed by *Fortune* and each of the selected corporations was again classified according to the categories noted in Section 3.5 above with some minor changes in the categories as noted. The measure of profitability used was return on invested capital (ROC). Statistical tests of significance on the relevant data over a 25 year period lead Rumelt (1982) to similar conclusions as in his 1974 work, namely that the related constrained group of firms was the most profitable whilst the dominant vertical and the unrelated business categories showed levels of profitability significantly below those of other categories. Rumelt (1982) then attempted to determine whether the differences observed among the categories were essentially due to effects of the industries in which the relevant firms happened to participate. After adjusting for industry effects, the author concluded that the high ROC of the related constrained group of firms was primarily an industry effect due to the concentration of this type of firm in high profit industries, thus supporting Christensen and Montgomery's (1981) observations. After adjusting for industry participation, Rumelt's (1982, p.367) conclusion with respect to the relative profitability of the categories nevertheless remains that "a pattern of declining profitability premiums with increasing diversity emerges."

Palepu (1985) hypothesised that (a) due to their greater market power, firms whose total level of diversification was high would generally exhibit greater profitability than firms whose total level of diversification was low and (b) that since firms pursuing a strategy of related diversification are more likely to achieve synergies than firms pursuing a strategy of unrelated diversification the profitability, as well as the rate of growth in profitability, of the former firms would be expected to be greater than that of the latter firms. Using Return on Sales as a measure of firm profitability, the author carried out statistical tests on a sample of 30 U.S. firms from the food product industry only (thus controlling for industry-specific effects) over a seven-year period, on the basis of which he concluded that his first hypothesis was not supported by the evidence whilst his second hypothesis was partly supported. Thus, whilst the profitability of firms pursuing a strategy of related diversification was not found to be significantly higher than the profitability of firms pursuing a strategy of unrelated diversification, the rate of growth in profitability of the former firms was found to be significantly greater than that of the latter firms.

Whilst the studies discussed above found a positive relationship between related diversification and financial performance, the studies carried out by other authors reach different conclusions. Thus, based on a study of 128 U.S. firms over a six-year period, Christensen and Montgomery (1981) offer an alternative explanation for the difference in performance which Rumelt (1974) found between related constrained and unrelated firms, namely that related constrained firms tend to be in industries whose market structure leads to above average profitability. The authors did not however address the question of why related constrained firms tend to be in such industries.

Bettis and Hall (1982) advanced possible reasons for the superior performance enjoyed by firms pursuing related diversification strategies. The authors suggest that this may occur (a) because these firms are more able to develop and pursue appropriate business strategies and/or (b) because these firms may have purposefully or by luck selected high profit industries and/or acquired high profit firms within particular industries. On the basis of the research they carried out on a sample of 80 U.S. firms over a five-year period, however, Bettis and Hall (1982) argue that the selection of an industry in which to participate may be more important than a related or unrelated diversification strategy. They point out that in Rumelt's (1974) study, four of the six highest ROA firms in the

related constrained category were major participants in the pharmaceutical industry. On the basis of F tests they carried out including and excluding these firms, the authors conclude that the superior performance of the related constrained firms in Rumelt's (1974) study was more of a reflection of the performance of the pharmaceutical industry rather than a reflection of the performance of the related constrained firms.

In a research study based on a sample of 108 Australian public companies, of which 63 had undertaken diversification programmes, McDougall and Round (1984) attempted to determine whether any statistically significant differences existed between the return on assets, return on equity, business risk, leverage and growth of the diversifying and nondiversifying firms. The authors conclude that no statistically significant differences were evident between the first four parameters relating to the two groups of firms though the diversifying firms demonstrated significantly higher rates of growth in profitability and in size. McDougall and Round (1984) also point out that when the diversifying group of companies was considered *on its own*, the more highly diversified firms were significantly more profitable than the less diversified firms. McDougall and Round (1984, p.397) conclude their study by stating that "The findings raise serious questions concerning the justification of a strategy of diversification and indicate some divergence between corporate motives for diversification and overall results". They argue that possible explanations for their findings that diversifiying firms do not outperform nondiversifying firms on most of the performance parameters they used are that (a) the diversifying firms may have placed greater emphasis on growth rather than on the other parameters (b) the diversifying firms may not have managed the diversification process successfully and (c) the costs of diversifying may have been greater than expected by the diversifying firms.

In a study which reached similar conclusions, Porter (1987) examined the diversification record of 33 major U.S. companies between 1950 and 1986. Between them, the companies had engaged in 3788 diversification initiatives, of which 70% were acquisitions, 22% were start-ups and 8% were joint ventures. The diversification initiatives were classified as having been made into entirely new fields (e.g. financial services) or into new industries within existing fields (e.g. insurance). Each new field was also classified as related or unrelated to existing business activities. The author found that on average the companies had divested more than 60% of their acquisitions

in entirely new fields and more than half of their acquisitions in new industries. 74% of the unrelated acquisitions, 50% of the joint ventures and 44% of the start-ups were subsequently divested. Porter (1987) describes this performance as "dismal" and suggests that the shareholders of these companies did not obtain any benefit through diversification.

Grant (1987) carried out a study in which he identified the six largest companies (those having assets of over $50 billion at the end of 1986) amongst the U.S. financial services firms which had diversified into related financial services areas over the previous ten years. The author hypothesised that the financial performance of these six companies would be superior to that of specialist financial services firms primarily due to the greater opportunities they had of exploiting economies of scope and reducing their transactions costs by developing internal markets. Grant (1987) argues that several opportunities to reap economies of scope exist in the financial services sector. These include the possibility of utilising a firm's tangible resources such as its distribution, data processing and research facilities, as well as its intangible resources such as its reputation and management skills, in the production and marketing of different financial services products. Furthermore, opportunities existed for financial services firms to create internal markets and reduce their transactions costs by avoiding certain costs of interacting with the market such as the costs of raising capital. After comparing the financial results of the six diversified firms with those of the specialist firms on the basis of their respective Return on Assets and Return on Equity ratios over a ten-year period, Grant (1987) concludes however that the performance of the diversified firms was worse than that of the specialist firms. The author attributes this mainly to the difficulties encountered by the diversified firms in integrating their new activities with their existing activities and in managing larger and more complex organisations.

Berger and Ofek's (1995) study attempted to assess the effects of diversification upon a firm's value. The authors took a sample of 3659 U.S. firms and separated these into single-segment firms, namely those which disclose only one line of business (or segment) in their published financial data and multi-segment firms, namely those which report more than one segment in their published financial data. (According to the regulatory requirements in the U.S., firms must provide information for segments whose sales, assets or profits exceed 10% of the consolidated totals). Berger and Ofek (1995)

attempted to impute a value to each of the segments of the multi-segment firms based upon the accounting ratios pertaining to similar segments of the single-segment firms and they thus obtained an imputed value for each multi-segment firm if all its segments were operated as stand-alone businesses. The authors then compared each multi-segment firm's actual value, calculated as the total book value of its debt plus the market value of its equity, with its imputed value to determine whether diversification enhanced or reduced the value of the multi-segment firms in the sample. Berger and Ofek (1995) conclude in their study that the multi-segment firms had values that averaged, between 1986 and 1991, 13% to 15% below the sum of the imputed value of their segments. They also conclude that the diversification discount increased as the multi-segment firms became more diversified. The authors find that over-investment and cross-subsidisation both contributed to the losses in value suffered by the diversified firms and they note that the tax benefits accruing to these firms were too small to offset the losses in value.

Using Berger and Ofek's (1995) methodology, Lins and Servaes (1999) extended the former authors' study to the U.K., Japan and Germany and found that the loss in value suffered by diversified firms amounted to 15% in the case of the U.K. and 10% in the case of Japan which was in line with Berger and Ofek's (1995) results for the U.S. However, the authors did not find a significant diversification discount in Germany and hypothesise that this may have happened due to the greater concentration of share ownership in that country which reduced the agency problems which existed in other countries and which, as discussed in Section 2.3.3.6, may lead firms to diversify in managements', rather than the shareholders', interests. In another extension to their 1995 study, Berger and Ofek (1996) concluded that the firms which had suffered the greatest loss in value due to diversification were also the most likely to be taken over and broken up into stand-alone businesses.

Some of the studies in the strategy area focus specifically upon whether any relationship exists between the diversification strategy undertaken by firms and their risk-return profile. Thus, Michel and Shaked (1984) took a sample of 51 firms which they categorised on the basis of Rumelt's (1974) classification scheme. The authors grouped the firms into three portfolios according to the degree of relatedness they exhibited and, using data over a five-year period, they established the risk-return profile of each

portfolio on the basis of the risk-return characteristics of the securities of the firms within each portfolio. Michel and Shaked (1984) concluded on this basis that the risk-return profile of the portfolio of firms which had diversified into unrelated activities was superior to that of the other two portfolios.

Amit and Livnat (1988) carried out a study on a sample of over 250 U.S. firms across a seven-year period to test their hypotheses that firms which diversify without creating any operating synergies (i.e. firms diversifying into unrelated businesses) would be characterised by relatively low variability in their cash flows and by relatively high leverage. Based on the statistical tests they carried out, Amit and Livnat (1988) conclude that the evidence supported their hypotheses. The authors also found that the profits of the more diversified firms were substantially lower than the profits of the less diversified firms and explain this result by hypothesising that the return required from the more diversified firms would be lower than that expected from the less diversified firms due to the former firms' reduced risks as a result of their more stable cash flows.

Bettis and Hall (1982) carried out a similar study to that of Amit and Livnat (1988) but reached different conclusions. The authors hypothesised that unrelated diversification strategies have lower levels of accounting risk than related diversification strategies because the former strategies would be expected to reduce the variability of a firm's earnings. The authors defined accounting risk as the variability of a firm's accounting returns over time and used the standard deviation of the ROA figure of the firms under study to measure this risk. The statistical tests carried out by Bettis and Hall (1982) on a sample of 80 U.S. firms over a five-year period did not however support their hypothesis and the authors conclude that they found no statistically significant differences in accounting risk between the two diversification strategies. Similar conclusions were reached by Bettis and Majahan (1985) who took the same sample of firms used by Bettis and Hall (1982) and grouped these firms into four clusters on the basis of their risk-return profiles. The standard deviation of the ROA figure of the firms under study over a five-year period was again used to measure risk. The authors noted that the four clusters of firms which emerged were each composed of firms pursuing different diversification strategies and concluded that different diversification strategies can yield a similar risk-return performance.

Chang and Thomas (1989) continued to investigate the relationship between diversification, risk and return, measuring risk as the variability in accounting return as in the studies carried out by Bettis and Hall (1982) and Bettis and Majahan (1985). Following Rumelt's (1974) categorisation scheme, Chang and Thomas (1989) hypothesised that the risk and the return associated with related constrained (RC) firms would be higher than those associated with related linked (RL) firms. In turn, the risk and the return associated with RL firms would be higher than those associated with the unrelated business (UB) category. The risk associated with the RC and RL firms was expected to be greater than that faced by the UB category because the businesses comprising the former categories shared common sources of uncertainty whilst the businesses comprising the latter category faced diverse sources of uncertainty. The return associated with the UB category was hypothesised to be lower than that associated with the other categories due to the relatively low market power which these firms were hypothesised to possess. Using the data relating to a sample of 64 firms over a five-year period, Chang and Thomas (1989) conclude on the basis of the statistical tests they carried out that the dominating influences on the firms' risk-return profiles were the characteristics of the markets served by the firms and the firms' size rather than the diversification strategies they followed.

Dubofsky and Varadarajan (1987) note that the conclusions reached by Michel and Shaked (1984) who used stock return data differed substantially from the conclusions reached by other authors such as Bettis and Majahan (1985) who used accounting measures of performance. Dubofsky and Varadarajan (1987) replicated Michel and Shaked's (1984) study but also applied accounting measures of performance to the data. The authors observe that their results were the same as Michel and Shaked's (1984) when they used stock return data, namely that the portfolio of firms which had diversified into unrelated activities demonstrated superior risk-return profiles. However, when accounting measures were used, no significant differences emerged between the different groups.

2.3.6.2 'Finance' Studies: M & A

Oster (1994) observes that in many countries M & A activity has occurred in waves. Thus in the U.S., for example, a M & A wave took place in the 1960's when over

25,000 M & A's were recorded and a further wave occurred in the 1980's when the value of the M & A's which took place exceeded $1200 billion. In view of the size and importance of the M & A phenomenon, several empirical research studies were carried out in the finance area to evaluate whether M & A's have resulted in any significant benefits to the firms involved or to their shareholders. Some of these studies compared the performance of firms which were involved in M & A's with the performance of firms which were not similarly involved. Other studies, known as 'event studies', focused on the changes which occurred in the share prices of the acquiring and acquired firms as a result of M & A.

Thus, Lev and Mandelker (1972) compared the pre-acquisition and post-acquisition performance of 69 firms which had made a major acquisition against the performance of a control group of firms which had not done so. The performance measures selected by the authors included both share return data and profitability data such as return on assets and the time period they studied spanned five years before and five years after the acquisition. The authors then proceeded to test some commonly held beliefs about the benefits derived from M & A activity by performing statistical tests of significance upon the data they collected. Lev and Mandelker (1972) found that, although M & A may have been expected to improve the share return and the profitability of the acquiring group of firms compared to the control group due to the synergies expected to arise from M & A, the statistical tests they carried out did not indicate that the differences between the data pertaining to the two groups were statistically significant. Also, no statistically significant differences emerged between the data relating to the growth rates, leverage, tax rates, liquidity positions and equity risk levels of the two groups, leading Lev and Mandelker (1972, p.85) to conclude that "the characteristics of merging firms are hardly distinguishable from those of comparable non-merging firms." The authors also note, however, that their study focused mainly on the long-run effects of mergers and did not consider the possible short-run effects upon the acquiring and acquired firms' stock prices and stockholders.

Haugen and Langetieg (1975) reached similar conclusions when they examined 59 mergers which took place in the U.S. between 1951 and 1968. They matched the two firms which had participated in each merger with two other firms which had not been involved in any M & A activity and which became part of a control group. Haugen and

Langetieg (1975) then sought to determine whether the mergers had resulted in any statistically significant differences between the risk position of the equity of the merged firms and that of the control group. The authors hypothesised that significant changes in the risk position of the equity would be evidence of changes in the firm's operating risks as a result of the merger. Haugen and Langetieg (1975) found no evidence of any such changes after the merger and concluded (p.1013) that "any stockholder could have obtained the same results on his own by combining the shares of the two companies in the appropriate proportions in his portfolio." A similar study carried out by Firth (1978) in the United Kingdom came to the same conclusions as Haugen and Langetieg (1975).

Jensen and Ruback (1983) synthesise the evidence contained in a number of 'event studies' which were carried out prior to their own study to estimate the effects of takeover bids upon the prices of the shares of the targeted and of the bidding firms around the time of the takeover bid. These studies estimate the abnormal share price changes at that time, measured by the difference between the actual and the expected share prices, to gauge the economic effects of takeovers. Jensen and Ruback's (1983) synthesis indicates that successful takeover bids generally result in substantial abnormal improvements in the share price of the targeted firm and in small abnormal improvements in the share price of the bidding firm whilst unsuccessful takeover bids generally result in marginal abnormal reductions in the share price of both the targeted and the bidding firms. Thus, the shareholders of the targeted firm benefit from successful takeover bids whilst the shareholders of the bidding firm do not lose which suggests that successful takeover bids should generally result in an increase in the combined market value of the two firms. The gain in the combined market value may however be relatively small if, as is generally the case, the acquiring firm is larger than the acquired firm and the latter firm's shares (which would have increased most in value) represent a relatively small proportion of the newly-combined firm's equity capital. The authors add that the reasons for the gains in successful takeovers had not yet been identified and hypothesise that these gains may occur due to the expectation that, following the takeover, the combined firms would enjoy benefits as a result of synergy, tax advantages, increases in market power or changes in management.

Roll (1986) reviews the evidence relating to the gains made from takeovers and contends that the evidence on the matter is not conclusive: some studies report an

increase in the combined market value of the acquired and acquiring firms whilst others indicate a decrease though the results are not statistically significant in either case. Roll (1986) argues that in an efficient financial market, share prices would reflect all information about individual firms. If an acquiring firm is prepared to pay more than the current market price for the shares of a target firm, this means either that the bidding firm's valuation of the target firm's shares is incorrect or that the bidding firm has information about the target firm of which the financial market is not aware. The author argues further that the fact that studies on the subject do not reveal that any significant gains or losses arise as a result of takeovers is not inconsistent with the hypothesis that the market is pricing the shares of the companies involved correctly. Roll (1986) thus hypothesises that a partial explanation for the fact that acquiring firms are prepared to pay a premium for the shares of the firms they acquire is simply that this sometimes occurs due to valuation errors made by management "on the overbearing presumption of bidders that their valuations are correct (p.200)." In some instances, however, a bidder's judgement that a target firm's shares are undervalued by the market may be correct.

Shleifer and Vishny (1991) confirm that in the latter half of the last century two large M & A waves were experienced in the U.S., one in the 1960's and the other in the 1980's. The first M & A wave was characterised by friendly acquisitions which were of a conglomerate nature and outside the acquirer's main line of business whilst in the second wave many M & A transactions were hostile acquisitions which were followed by sell-offs of substantial portions of the acquired firms' assets to other firms in the same industry. The 1980's also saw many firms divesting themselves of unrelated businesses and acquiring firms in related business areas. Shleifer and Vishny (1991) attribute the move towards diversification and conglomeration in the 1960's primarily to the rigid antitrust enforcement in those years which did not allow mergers of firms in the same industry and also to the prevailing management philosophy at the time which held that substantial benefits would result from diversification. In the 1980's, changes occurred in both of these factors. Studies on diversification showed that the benefits actually derived through this strategy were generally fewer than had been expected. Furthermore, the antitrust policies in the U.S. were relaxed and mergers of firms in the same industry were allowed to take place. Thus, Shleifer and Vishny (1991) conclude that whilst the M & A wave in the 1960's was a move towards unrelated diversification,

the 1980's wave was a move to consolidation and specialisation which largely undid what the previous wave had created.

The authors observe that two theories purport to explain the above-mentioned developments. One theory holds that that the conglomerate mergers which took place in the 1960's were appropriate for that period since the M-form organisation generally found in conglomerate firms was more efficient in allocating investment resources than independent firms would have been due to the role played by the central office in this respect. In the 1980's, however, competition became more intense and it became more important for management to specialise and to have an intimate knowledge of the market than to act in a central capacity. The market thus broke up conglomerates and reallocated their assets to more focused and specialised companies and the new antitrust policies accommodated this move. An alternative theory holds that a substantial part of the move towards conglomerate diversification in the 1960's was a mistake which occurred primarily because, due to the antitrust policies existing in those years, this was the only avenue open to firms which were seeking growth through acquisition. However, when it became clear that conglomerate diversification did not result in any significant benefits, and at the same time the antitrust environment changed, firms proceeded to divest themselves of their unrelated businesses to concentrate on their core business. When they did not do so themselves, hostile acquisitions took place which returned their unrelated businesses to other firms in the same line of business.

Shleifer and Vishny (1991) point out that the movements in the share returns of the companies involved in M & A activities in the 1960's and 1980's generally indicate that the stock market approved of the transactions which were taking place at the time. Although acceptance of the second theory would therefore imply that the stock market was wrong in reacting positively to conglomerate diversification in the 1960's, the authors nevertheless favour this theory since, as they state (p.55) "...there is no evidence we know of that suggests that conglomerates improved the profitability and efficiency of the firms they acquired." The authors thus conclude that the stock market wrongly assessed the benefits of unrelated diversification in the 1960's because of its lack of experience till then with this form of diversification. However, the stock market later changed its view of conglomerate diversification, as evidenced by a study carried out by Morck et al. (1990) which concluded that in the 1980's the stock prices of bidding firms

rose when they bought other firms in the same industry and fell with unrelated diversification. In a study which examined diversification activity in the U.S. between 1961 and 1976, Servaes (1996) found that, during most of the years under study, diversified firms were valued by the market at a substantial discount compared to single segment firms. Contrary to Shleifer and Vishny's (1991) conclusions, Servaes' (1996) findings thus indicate that the stock market correctly interpreted the performance outcome of diversification during the 1960's. As the author (p.1203) remarks, however, following his results "we are left with a puzzle as to why diversification occurred in the first place".

Kaplan and Weisbach (1992) took a sample of 271 large (valued at over $100 million) acquisitions completed between 1971 and 1982 and found that 44% of these acquisitions had been divested by the end of 1989. The authors argue that the fact that an acquisition was subsequently divested does not necessarily mean that the acquisition was not successful and they attempt to classify the divested acquisitions into those which were successful and those which were not successful. Kaplan and Weisbach (1992) define successful acquisitions as those which showed satisfactory accounting results during the period between their acquisition and divestment and those which realised an accounting gain when they were divested. The authors found that only 34% of the acquisitions which were divested appeared to have been divested because their performance was unsatisfactory. Furthermore, a loss on divestiture was reported in the case of 44% of the acquisitions which were divested whilst the remaining 56% reported a gain or no loss and Kaplan and Weisbach (1992) conclude on this basis that a substantial proportion of the acquisitions which were subsequently divested could not be held to have been failures. Furthermore, the authors find that acquisitions in which the business of the acquiring and the acquired companies was unrelated were divested more often than acquisitions in which the business was related.

2.3.6.3 'Finance' Studies: Conglomerates

Several studies in the finance area focus upon the effects of conglomerate diversification upon firms' financial performance. Berger and Ofek (1995) note that during the 1950's and 1960's many corporations undertook massive diversification programmes which led to the growth of large conglomerate firms and, as a result of this

development, several authors undertook studies of this phenomenon. Some of the studies carried out compare the performance of conglomerate firms with that of non-conglomerate firms whilst others compare the performance of conglomerates with that of portfolios of securities. The authors of these studies define conglomerate firms in broadly the same terms as Weston and Mansinghka (1971, p.921), namely "firms which have entered into a broad program of diversification achieved to a substantial degree by external mergers and acquisitions rather than by internal development."

Thus, Weston and Mansinghka (1971) identified 63 U.S. firms which fulfilled their definition of conglomerates and they also selected two control groups of non-conglomerate firms on a random basis. Weston and Mansinghka (1971) then compared the performance of the conglomerates in 1958 and in 1968 with that of the control groups on the basis of Return on Assets and concluded that, whilst the performance of the conglomerates in 1958 was significantly worse than that of the control groups, this was not the case in 1968 when the performance of the conglomerate firms was comparable to that of the control groups. The authors also found that the growth rates achieved by the conglomerate firms during the period were significantly higher than the growth rates of the firms in the control groups. Furthermore, the conglomerate firms exhibited relatively high leverage ratios which grew more rapidly than those of the control groups over the period. The authors conclude on the basis of this evidence that the conglomerate group of firms engaged in diversification programmes during the period as a defensive measure in order to avoid adverse effects on their profitability from developments which were taking place in their traditional product market areas. Conglomerate diversification thus served an important economic function for these firms by preserving their value and raising their profitability. Weston and Mansinghka (1971) do not attach any major significance to the high growth rates achieved by the conglomerate firms which they attribute to the M & A activity undertaken by these firms during the period.

Melicher and Rush (1973) came to similar conclusions in their study in which they selected a sample of 45 conglomerate firms and a control sample of an equal number of non-conglomerate firms drawn from the same industries as the conglomerate firms. The authors then compared the performance of the conglomerate and non-conglomerate firms between 1965 and 1971 and concluded that, whilst the conglomerate firms

exhibited higher leverage levels, the profitability characteristics of the two groups of firms were comparable The authors also found that the two groups exhibited comparable levels of risk and provided comparable returns to their investors. Melicher and Rush (1973) thus conclude that the conglomerate firms achieved an average level of performance and that they did not appear to be any better or worse off than the firms which did not choose to diversify from their original industry.

Mason and Goudzwaard (1976) attempted to evaluate conglomerate performance by comparing the performance of 22 conglomerate firms against the performance of simulated portfolios of stocks which mirrored the asset structures of the conglomerate firms. The authors obtained a breakdown of the asset structures of the conglomerate firms in their sample and proceeded to construct matching portfolios of randomly selected stocks in the same industry categories and in the same proportions as those in which the conglomerates had invested. Using the rate of return to total assets and the rate of return to stockholders between 1962 and 1967 as their performance measures, the authors hypothesised that the conglomerate firms would outperform their matching portfolios in view of the greater management control which existed over the investments made by the former. Mason and Goudzwaard (1976) found however that the simulated portfolios significantly outperformed the conglomerate firms on both of their performance measures and conclude their study by stating (p.48) that they "believe the case for conglomerates is yet to be made."

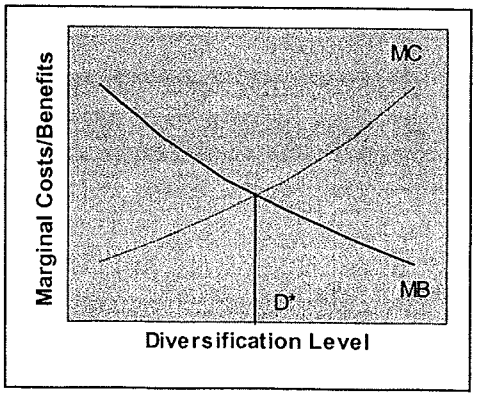
Williams et al. (1988) investigated whether the theoretical and empirical uncertainty surrounding the benefits derivable from conglomerate diversification led to changes in conglomerates' behaviour between 1975 and 1984. The authors took a sample of 82 conglomerate firms and examined the acquisitions and divestitures made by these firms over the period. They found (a) that the average number of business groups managed by the conglomerates fell steadily between 1979 and 1984 and (b) that the conglomerate firms increased the degree of relatedness amongst their businesses by acquiring companies which complemented or supplemented their major lines of business whilst divesting themselves of companies in unrelated business lines. On the basis of this evidence, the authors conclude that during the decade under study conglomerates were seeking to redefine the scope of their enterprise by reducing the number of businesses they managed and by increasing the degree of relatedness of their businesses.

2.3.6.4 Refocusing

Berger and Ofek (1995) observe that the trend towards conglomeration which occurred during the 1950's and 1960's was reversed over the last 15 years with many firms seeking focus and specialisation in their activities due to a perception that conglomerate diversification does not increase firm value. Markides (1993, 1995) notes that during the 1980's, a number of major diversified firms in the U.S. and Europe reduced their level of diversification by refocusing on their core business. Using Rumelt's (1974) classification, Markides (1993, 1995) analysed data relating to the *Fortune* 500 firms and found that the proportion of single business firms had increased significantly between 1981 and 1987 whilst the proportion of unrelated business firms had decreased. The author also found that the firms which were refocusing were those characterised by a relatively high level of diversification (including conglomerates) and poor performance compared to their industry counterparts. Most of the firms which were refocusing were doing so primarily by divesting unrelated businesses and acquiring related ones.

The author argues that as a firm diversifies, the additional benefits it can derive from diversification decline whilst the costs of diversification increase, as illustrated in Figure 2.2. The latter may occur due to diseconomies of scale which can arise for various reasons such as the increasing difficulty of managing the firm as its size and diversity increase. The author suggests that this implies that there is an optimal limit (D* in Figure 2.2) with regard to how much firms should diversify and any diversification beyond this limit may be considered to be excessive.

FIGURE 2.2: DIVERSIFICATION HYPOTHESIS (MARKIDES (1993, 1995))



Markides (1993, 1995) argues further that between 1960 and 1980, many firms diversified beyond their optimal limit and the refocusing which they undertook during the 1980's may be understood as an attempt by them to reduce their excessive level of diversification. Possible reasons for the excessive diversification of some firms during the 1960's and 1970's include the overestimation by both management and the capital markets of the benefits of diversification and management's desire for the firm to grow even though this may not have been in the shareholders' best economic interests. Markides (1993, 1995) holds that the profitability and market value of the firms which over-diversified suffered, as evidenced by the gap between their market value and their break-up value. To remedy this, these firms are seeking to reduce their level of diversification by refocusing their business interests. In some cases, the firms are carrying out this process voluntarily whilst in others they are forced to do this due to the threat or the fact of takeover. The author concludes that the refocusing process should improve these firms' profitability since it allows managers to concentrate on what they know best which allows them to become more efficient and productive.

Berger and Ofek (1996) confirm Markides' (1993, 1995) conclusions, observing that the firms which had suffered the greatest loss in value due to diversification in their study were also the most likely to be taken over and broken up into stand-alone businesses. Comment and Jarrel (1995) used business segment data, which was also utilised in Berger and Ofek's (1995) study, to determine whether the corporate focus of U.S. firms increased between 1978 and 1989. The authors used five different measures of focus, such as the number of business segments reported by each firm, and concluded that all five measures showed an increase in focus during the period. Furthermore, Comment and Jarrel (1995) found that, whichever measure of focus was used, a relationship could be demonstrated between an increase in focus and an increase in stock return. Thus, for example, a reduction of one business segment resulted in an increase in stock return of around 5%, and vice-versa for a decrease in focus. The authors argue that the trend in the 1980's towards refocusing demonstrates that the diversification programmes undertaken by many firms prior to the 1980's did not result in any significant benefits to the firms' shareholders.

2.3.6.5 Summary and Conclusions

Several empirical research studies which attempt to investigate the relationship between diversification and financial performance have been reviewed in this Section. These studies were broadly categorised into those which fell within the 'strategy' discipline and those which fell within the 'finance' discipline. In the latter case, the studies were grouped into those which investigated M & A's in general terms and those which focused upon conglomerate diversification.

Whilst the earlier studies in the strategy area (for example Rumelt (1974) and Bettis (1981)) concluded that a clear relationship existed between the extent to which a firm diversified and its financial performance, insofar as the performance of firms which diversified into areas related to their original activities was superior to that of firms which diversified into unrelated areas or which remained specialist, subsequent researchers disputed these conclusions. Thus, Christensen and Montgomery (1981) held that the performance of the firms in Rumelt's (1974) study was influenced by the industries to which the firms belonged and this conclusion was supported by Bettis and Hall (1982) who showed that the superior performance of the related constrained firms in Rumelt's (1974) study was primarily due to several of these firms being major participants in the pharmaceutical industry. Notwithstanding this, Rumelt maintained in his 1982 study that his original conclusions were valid even after adjusting for industry participation. Subsequent research on the matter was not conclusive with, for example, Palepu (1985) supporting some of Rumelt's (1974) conclusions and McDougall and Round (1984) contradicting them. In a recent study on the matter, Berger and Ofek (1995) concluded that diversification had resulted in a loss in value to the firms in their sample with the firms which had diversified most suffering the greatest loss in value.

Some studies in the strategy area focus specifically upon whether any relationship exists between the diversification strategy undertaken by firms and their risk-return profile but here again the results are not conclusive. Thus, using stock return data, Michel and Shaked (1984) concluded that the risk-return profile of a portfolio of firms which had diversified into unrelated activities was superior to that of portfolios of firms which had diversified into related activities. However, other studies such as that carried out by Bettis and Majahan (1985) and Chang and Thomas (1989) which utilised accounting

return data failed to find any significant differences in the risk-return profiles of firms pursuing different diversification strategies.

Similarly, the empirical research studies carried out in the M & A area do not reach consensus as to whether or not M & A's have resulted in real economic gains to the participating companies. Thus, Jensen and Ruback (1983) concluded that 'event studies' showed that successful takeover bids generally resulted in an increase in the combined market value of the shares of the acquiring and the acquired firms which suggests that the market expected real economic gains to emerge from the takeovers. Other authors such as Roll (1986) argue that there is no conclusive evidence that M & A's have resulted in real economic gains to the participating companies and hypothesise that the increases in the market value of the shares observed in the 'event studies' could arise as a result of incorrect valuations of the target firms' shares by the bidding firms at the time of acquisition. Whilst Porter (1987) argues that the fact that a number of acquisitions were subsequently divested demonstrates that these acquisitions were not successful, Kaplan and Weisbach (1992) hold that in some instances acquisitions may be considered to have been successful even though they were subsequently divested. Studies such as Lev and Mandelker's (1972) which compared the performance of firms which were involved in M & A's with the performance of firms which were not similarly involved concluded that there were no statistically significant differences between the performance of the two groups.

A greater degree of consensus appears to have been reached by the authors of empirical research studies on conglomerate diversification. Some of the studies carried out such as that by Mason and Goudzwaard (1976) compare the performance of conglomerates with that of portfolios of securities whilst others such as that by Melicher and Rush (1973) compare the performance of conglomerate firms with that of non-conglomerate firms. The various studies carried out do not generally find a positive relationship between conglomerate diversification and financial performance and several studies conclude that the performance of conglomerates was at best comparable with the performance of non-conglomerates or portfolios of securities.

Several authors (Williams et al. (1988), Berger and Ofek (1995)) observe that, due to the realisation that the benefits which were realised through diversification during the

1960's and 1970's were generally fewer than had been expected, many firms reduced their level of diversification and refocused on their core business during the 1980's and 1990's. In some cases, this process was carried out voluntarily by the firms themselves whilst in others they were forced to do this by the threat or the fact of takeover. Comment and Jarrel (1995) confirm the trend towards refocusing in recent years and find that increases in corporate focus resulted in improvements in stock return in the case of several of the firms they sampled.

As may be noted, the conclusions reached in the empirical research studies reviewed in this Section are in many instances inconsistent and in some cases contradictory. Several reasons may be adduced for this, including the fact that different measures of performance were used in the studies. Whilst some studies focused upon the profitability of the firms they sampled, others concentrated upon the firms' risk-return profiles. Some studies such as Michel and Shaked's (1984) used stock return data whilst others such as Bettis and Majahan's (1985) used accounting data. Also, different measures of diversity were used in the studies. Whilst several studies utilised Rumelt's (1974) classification scheme, other studies such as that by McDougall and Round (1984) developed their own measures. Furthermore, the methodology used in the various studies differs. Thus, for example, some studies compare the performance of diversifying firms with the performance of control groups of firms or portfolios of securities whilst other studies focus upon the effects of diversification upon firms' share price or accounting results. Some studies suffer from methodological deficiencies insofar as, for example, they do not give any consideration to the type and level of diversification undertaken by firms and / or they do not control for factors such as size and market-to-book ratio which have been shown to have a significant influence on firms' performance. Finally, the results of the studies carried out may well have been confounded by factors such as the motives of the firm's management in implementing a diversification strategy and the difficulties encountered in integrating a firm's new activities with its existing activities.

In summary it may be stated that, although related diversification would be expected to have positive effects upon firms' performance on theoretical grounds, the empirical evidence in this respect is not conclusive. There appears to be some evidence, however, that conglomerate diversification has not generally resulted in significant improvements

in firms' performance. Commenting on the empirical research studies carried out on diversification, Johnson and Scholes (1993, p.270) observe that "...a universal prescription of the benefits of diversification is unlikely to be found." Berger and Ofek (1995, p.40) concur, commenting that "There is no clear prediction about the overall value effect of diversification." The current status of the research on the issue is aptly summed up by Palich et al. (2000, p.156) who state that "Despite the proliferation of studies on the subject, no clear consensus exists regarding the state of knowledge to date."

Palich et al. (2000) elaborate that, notwithstanding the large amount of research which has been carried out on the issue over the last thirty years, the research has not yet reached maturity insofar as (a) the studies have not generated reasonably consistent and interpretable findings and (b) the research has not yet led to a general consensus concerning the nature of key relationships. Reviewing previous research studies, the authors point out that three main hypotheses have been put forward in the literature with respect to the relationship between diversification and firms' financial performance, as outlined below and illustrated in Figure 2.3. In their analysis, Palich et al. (2000) equate related diversification with a moderate amount of diversification and unrelated diversification with a high level of diversification, pointing out that several empirical research studies found that type of diversification (related or unrelated) was strongly related to the level of diversification. Montgomery (1982, p.305), for example, remarks that her study found a "high degree of correspondence between the continuous and categorical...diversification measures." (Continuous diversification measures relate to the level of diversification as represented by SIC codes whilst categorical diversification measures relate to the type of diversification).

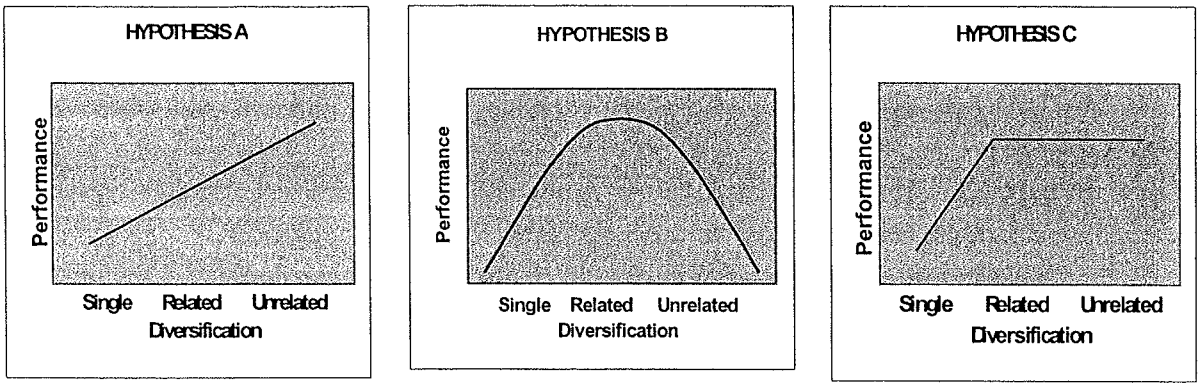
- Hypothesis A: that firms' financial performance improves as they diversify into related activities (which usually represents a moderate level of diversification) and continues to improve as they diversify into unrelated activities (which usually represents a high level of diversification). This is mainly due to the firms' increased market power and their increased opportunity to take advantage of internal market efficiencies, lower transactions costs and tax benefits.

- Hypothesis B: that firms' financial performance improves as they diversify into related activities but then deteriorates as they diversify further into unrelated activities. This is because firms which have diversified into related activities would be in a good position to reap synergy and economies of scope from their activities, additionally to the benefits outlined in Hypothesis A above. However, as firms diversify further into unrelated activities, it becomes more difficult to obtain synergies and economies of scope and also to manage the more complex organisation leading to diminishing returns from the increased level of diversification. (This hypothesis corresponds closely to that of Markides (1993, 1995) discussed in Section 2.3.6.4).

- Hypothesis C: that firms' financial performance improves as they diversify into related activities and then levels out as they diversify further into unrelated activities, with equal benefits being derived from related and unrelated diversification. In this hypothesis it is argued that (a) in practise, it may be difficult for firms diversifying into related activities to realise synergies and economies of scope and (b) the benefits from unrelated diversification would become greater as a firm becomes more diversified, offsetting the disadvantages of this type of diversification.

The three hypotheses may be depicted graphically as follows:

FIGURE 2.3: DIVERSIFICATION HYPOTHESES (PALICH ET AL. (2000))



Palich et al. (2000) attempted to test the three hypotheses outlined above by carrying out a "meta-analytic" study in which they quantitatively synthesised 82 previously published research studies and concluded that the evidence to date provided greatest

support to Hypothesis B, namely that firms' financial performance improves as they diversify into related activities but then deteriorates as they diversify further into unrelated activities. "Financial performance" was measured on the basis of accounting measures and market measures. In a similar "meta-analytic" study in which 50 research studies were quantitatively synthesised, Perry (1998) reached analogous conclusions, namely that the accounting and market-based results of firms which diversified into related activities were superior to those of firms which diversified into unrelated activities.

2.3.6.6 Critique of Performance Studies

Several studies which investigated the relationship between diversification and financial performance were reviewed in Section 2.3.6 and the literature on this issue is critiqued below.

(i) in most of the 'strategy' studies, accounting-based, rather than market-based, measures of financial performance were used. However, as discussed in further detail in Section 3.5, accounting measures are subject to several limitations such as the differences in accounting practices which exist in different countries and companies and the fact that the data in accounting statements may be susceptible to manipulation to show a firm's results in a better light. On the other hand, market measures such as share return are relatively objective and unbiased indicators of firms' financial performance and, for robustness, should be used together with accounting measures when assessing performance.

Furthermore, in several of the 'strategy' studies, comparisons were made between the financial performance of firms which were specialised or which had pursued a strategy of related or unrelated diversification without controlling for factors such as size and market-to-book ratio which, as discussed in further detail in Section 3.4, have been shown to have a significant influence on firms' share returns.

(ii) whilst several 'finance' studies used market-based measures of financial performance, thus obviating the criticism of the 'strategy' studies made above in this respect, many of the 'finance' studies equate diversification to M & A without

attempting to determine whether the activities of the acquired company were related or unrelated to those of the acquiring company. These studies thus lack an important dimension of the 'strategy' studies insofar as they reach no conclusions as to whether firms' financial performance was affected by the type and level of diversification into which they entered.

As in the case of the 'strategy' studies, when selecting control groups of companies, many of the 'finance' studies did not control for factors such as size and market-to-book ratio which can have a significant influence on firms' share returns.

(iii) whilst the "meta-analytic" studies are of value insofar as they synthesise the results of several previous studies, they also suffer from the limitations noted above of the underlying studies on which they are based.

Several of the studies carried out on the relationship between diversification and financial performance thus suffer from the methodological deficiencies outlined above and it is suggested that future studies should integrate the 'strategy' and 'finance' approaches to research in this area and (a) utilise both market and accounting measures in the assessment of financial performance (b) give due consideration to the type and level of diversification undertaken by firms and (c) control for factors such as size and market-to-book ratio which have been shown to have a significant influence on firms' share returns. A degree of convergence between the 'strategy' and 'finance' approaches is in fact noted in the more recent diversification studies, such as those by Berger and Ofek (1995) and Markides (1993, 1995), both of which considered the level of firms' diversification and used accounting and market measures of performance in reaching conclusions.

SECTION 2.4: CHRONOLOGICAL SYNTHESIS OF LITERATURE REVIEW

2.4.1 Introduction

This Section of the Literature Review synthesises the material presented in the previous two Sections chronologically and draws conclusions from it with particular reference to whether the studies reviewed reveal any pattern of impact that varies over time with respect to the diversification of non-financial companies into the financial services industry. The focus in this Section is thus on the literature which relates to the time aspects of diversification, rather than on the literature which relates to the conceptual and theoretical aspects since, by definition, the latter literature would apply to all time periods.

2.4.2 Diversification: General Trends

Oster (1994) observes that in many countries merger and acquisition (M & A) activity has occurred in waves. Thus in the U.S., for example, a M & A wave took place in the 1960's when over 25,000 M & A's were recorded and a further wave occurred in the 1980's when the value of the M & A's which took place exceeded $1200 billion. Shleifer and Vishny (1991) observe that the first M & A wave was characterised by friendly acquisitions which were of a conglomerate nature and outside the acquirer's main line of business whilst in the second wave many M & A transactions were hostile acquisitions which were followed by sell-offs of substantial portions of the acquired firms' assets to other firms in the same industry. The 1980's also saw many firms divesting themselves of unrelated businesses and acquiring firms in related business areas.

Shleifer and Vishny (1991) attribute the move towards diversification and conglomeration in the 1960's primarily to the rigid antitrust enforcement in those years which did not allow mergers of firms in the same industry and also to the prevailing management philosophy at the time which held that substantial benefits would result from diversification. In the 1980's, changes occurred in both of these factors. Studies on

diversification showed that the benefits actually derived through this strategy were generally fewer than had been expected. Furthermore, the antitrust policies in the U.S. were relaxed and mergers of firms in the same industry were allowed to take place. Thus, Shleifer and Vishny (1991) conclude that whilst the M & A wave in the 1960's was a move towards unrelated diversification, the 1980's wave was a move to consolidation and specialisation which largely undid what the previous wave had created. Markides (1993, 1995) notes that during the 1980's, a number of major diversified firms in the U.S. and Europe reduced their level of diversification by refocusing on their core business. The author also found that the firms which were refocusing were those characterised by a relatively high level of diversification and poor performance compared to their industry counterparts. Most of the firms which were refocusing were doing so primarily by divesting unrelated businesses and acquiring related ones. Similar conclusions were reached by Berger and Ofek (1995) who observe that the trend towards conglomeration which occurred during the 1950's and 1960's was reversed in the 1980's and 1990's with many firms seeking focus and specialisation in their activities due to a perception that conglomerate diversification does not increase firm value.

As noted by Shleifer and Vishny (1991), the prevailing management philosophy before the 1980's held that substantial benefits would result from conglomerate diversification. Thus, Williamson (1975) argues that managerial efficiencies would arise as a result of conglomerate diversification since diversified firms are likely to have multidivisional structures which would be expected to improve a firm's internal operating efficiency by assigning responsibility for operating decisions to the divisions whilst allowing central management to concentrate upon strategic issues and upon co-ordinating the allocation of financial and other resources within the organisation. Weston and Mansinghka (1971) conclude that conglomerate firms engaged in diversification programmes during the 1960's as a defensive measure in order to avoid adverse effects on their profitability from developments which were taking place in their traditional product market areas. Conglomerate diversification thus served an important economic function for these firms by preserving their value and raising their profitability.

Whilst the later studies on diversification do not generally support the notion that conglomerate diversification is beneficial to firms, they provide some evidence that

related diversification is of benefit. Thus, Melicher and Rush (1973) and Mason and Goudzwaard (1976) find that conglomerate firms achieved an average level of performance in the 1960's and that they did not appear to be any better or worse off than firms which did not choose to diversify from their original industry. Similarly, Lev and Mandelker (1972) and Haugen and Langetieg (1975) did not find that M & A activity in the 1960's and 1970's had led to significant improvements in the combined firms' share prices whilst Roll (1986) reports that the evidence relating to the gains made from M & A's is not conclusive with some studies reporting an increase in the combined market value of the acquired and acquiring firms whilst others indicate a decrease. However, using a different methodology based on firms' diversification strategies, Rumelt (1974, 1982), Bettis (1981) and Palepu (1985) concluded that the performance of firms which diversified into areas related to their original activities was superior to that of firms which diversified into unrelated areas or which remained specialist. Subsequent researchers (for example Christensen and Montgomery (1981), Bettis and Hall (1982)) disputed these conclusions, however, holding that the performance of the firms in the earlier studies was significantly influenced by the industries to which the firms belonged. Nevertheless, in his 1982 study Rumelt maintained that his original conclusions were valid even after adjusting for industry participation.

The conclusions reached in the research studies noted above were reinforced by the research carried out in the late 1980's and 1990's. Commenting on the multidivisional structures advocated by Williamson (1975), Shleifer and Vishny (1991) conclude that due to the intensification of competition in the 1980's it became more important for management to specialise and to have an intimate knowledge of the market than to act in a central capacity. The market thus broke up conglomerates and reallocated their assets to more focused and specialised companies and the new antitrust policies accommodated this move. Williams et al. (1988) observe that between 1975 and 1984 conglomerates were seeking to redefine the scope of their enterprise by reducing the number of businesses they managed and by increasing the degree of relatedness of their businesses. Similarly, Porter (1987) finds that by 1986, 33 major U.S companies had divested more than half of the diversification initiatives they had made into new business activities whilst Grant (1987) concludes that the performance of conglomerate financial services firms was worse than that of specialist firms in the area.

The above is confirmed by Markides (1993, 1995) who observes that during the 1980's, a number of major diversified firms in the U.S. and Europe reduced their level of diversification by refocusing on their core business. The author argues that as a firm diversifies, the additional benefits it can derive from diversification decline whilst the costs of diversification increase. Markides (1993, 1995) argues further that between 1960 and 1980, many firms diversified beyond their optimal limit and the refocusing which they undertook during the 1980's may be understood as an attempt by them to reduce their excessive level of diversification. The author holds that the profitability and market value of the firms which over-diversified suffered and to remedy this, these firms are seeking to reduce their level of diversification by refocusing their business interests. This should improve these firms' profitability since it allows managers to concentrate on what they know best which allows them to become more efficient and productive.

Reaching similar conclusions, Comment and Jarrel (1995) used business segment data to determine whether the corporate focus of U.S. firms increased during the 1980's. The authors used different measures of focus and found that, whichever measure was used, a relationship could be demonstrated between an increase in focus and an increase in stock return. The authors argue that the trend in the 1980's towards refocusing demonstrates that the diversification programmes undertaken by many firms prior to the 1980's did not result in any significant benefits to the firms' shareholders. Supporting these arguments, Berger and Ofek (1995) observe that the trend towards conglomeration which occurred during the 1950's and 1960's was reversed in the 1980's and 1990's with many firms seeking focus and specialisation in their activities due to a perception that conglomerate diversification does not increase firm value. In their study, Berger and Ofek (1995) attempted to assess the effects of diversification upon firm's value in the 1980's and 1990's. The authors took a sample of single-segment and multi-segment U.S. firms and attempted to impute a value to each of the segments of the multi-segment firms based upon the accounting ratios pertaining to similar segments of the single-segment firms. The authors then compared each multi-segment firm's actual value with its imputed value to determine whether diversification enhanced or reduced the value of the multi-segment firms and concluded that the multi-segment firms had values that were below the sum of the imputed value of their segments. They also concluded that

the diversification discount increased as the multi-segment firms became more diversified. Using Berger and Ofek's (1995) methodology, Lins and Servaes (1999) extended the former authors' study to the U.K., Japan and Germany and found that similar losses in value were suffered by diversified firms in these countries in the 1990's. In another extension to their 1995 study, Berger and Ofek (1996) concluded that the firms which had suffered the greatest loss in value due to diversification were also the most likely to be taken over and broken up into stand-alone businesses, thus confirming Markides' (1993, 1995) conclusions.

2.4.3 Diversification into the Financial Services Industry

The diversification of firms into the financial services industry was also influenced by the trends noted above, as well as by other trends which specifically affected the industry. The literature on this matter is synthesised chronologically in this Section to continue investigating whether the studies reviewed reveal any pattern of impact that varies over time.

The entry of non-financial companies into the financial services industry is not a new phenomenon and in the case of some companies goes back to the early part of the last century (Rosenblum and Pavel (1986)). The authors note that Ford began making automotive loans in 1928 whilst General Electric started to finance distributor inventories and sales of products to consumers in 1932. The authors add, however, that whilst the entry of non-financial companies into the financial services industry is not a new phenomenon, the pace of entry has accelerated over the years. Industry observers (Ballarin (1986), Kimball Dietrich (1996), Taylor and Morison (1999)) consider deregulation, developments in information and communications technology (ICT) and changes in the economic environment to be amongst the most important driving forces which have stimulated this development.

Kaufman et al. (1983, 1984) attribute the growth of the regulatory regime in the U.S. mainly to the problems created by the Great Depression of the 1930's which resulted in several banking failures. Legislative measures were introduced at the time which included restrictions on the interest rate levels payable by banks and on the geographic expansion of banks. Kaufman et al. (1983, 1984) add that during the 1960's and 1970's

pressures arose from several sources to relax the regulatory regime which had been imposed upon the financial services industry in previous years. Thus, rapid advances in information technology diluted the effectiveness of the geographic restrictions placed upon banks. Also, rising interest and inflation rates in the 1970's made it untenable for banks to maintain ceilings on the interest rates they paid. Furthermore, banks faced increasing competition from non-bank financial institutions which were not subject to certain of the restrictions imposed upon the banks. Thus, the 1980's and 1990's saw a reduction in the level of regulation imposed upon the financial services industry in the U.S. primarily as a result of the factors mentioned above and also due to a political climate in the U.S. which generally favoured the encouragement and liberalisation of competitive forces. Similar developments also occurred in several Western European countries ((Canals (1993), Kimball Dietrich (1996), Flier et al. (2001)), where a traditionally tight regulation of the financial services sector was followed in recent years by regulatory reform and an increase in the level of competition in the sector. The movement towards the creation of a single market within the European Union was a further stimulus towards the deregulation of the financial services industry in Western Europe.

Changes in the economic environment also stimulated the diversification of non-financial companies into the financial services industry. Thus, for example, the rise in interest rates during the 1970's made the users of finance become more aware of the costs of finance, giving them an incentive to attempt to reduce these costs by considering using alternative financial products and financial intermediaries (Ballarin (1986)). The users of finance also had an incentive to avoid financial intermediaries altogether and go directly to the capital markets to issue their own commercial paper. The rise in interest rates also made it untenable for banks in the U.S. to maintain ceilings on the level of interest they paid resulting in pressures being put upon the Authorities by the banks to remove this regulatory measure. Another economic factor which significantly effected the development of the financial services industry during the 1980's and the 1990's was the volatility of exchange rates which resulted in the development by the financial services industry of new financial products designed to control the risks arising from exchange rate fluctuations.

The rapid development of information and communications technology (ICT) during the 1980's and 1990's has had an impact upon many industries including the financial services industry. The developments in ICT have introduced major changes in respect of the links between financial services firms and their customers and in respect of the links between the financial services firms themselves (Devlin and Wright (1995)). The evolution of ICT coupled with the deregulation of the financial services industry also stimulated non-financial firms to take advantage of the synergy and economies of scope existing between their products, distribution channels, databases and other resources and those relating to the provision of financial services. In the 1990's, the advent of cable and digital broadcasting systems and of the internet continued to vastly expand ICT's ability to create linkages between financial services firms and their customers and between financial services firms, giving rise to more innovative financial services products such as telephone banking and internet banking.

The developments outlined above intensified competition within the financial services industry and facilitated the entry of non-financial companies into the industry. Thus the deregulation of the industry in the 1980's and 1990's allowed, and also stimulated, many of the traditional participants in the industry such as commercial banks and building societies to broaden their product range and to widen the scope of their geographic operations. This strengthened the bargaining position of the industry's customers since the suppliers of financial services, as well as the products they offered, increased in number and type. Deregulation also lowered the barriers to entry into the industry in the 1980's and 1990's which accelerated the pace of entry of other, less traditional, players such as non-financial companies into the industry. This process was facilitated by developments in ICT in the 1990's which introduced major changes in respect of the links between financial services firms and their customers and in respect of the links between the financial services firms themselves and again resulted in a lowering of the barriers to entry into the industry since the new entrants did not need to invest heavily in, for example, establishing distribution channels such as a branch networks. The evolution of ICT also stimulated non-financial firms to take advantage of the synergy and economies of scope existing between their business activities and those relating to the provision of financial services, and the deregulation of the financial services industry allowed them to do this. Furthermore, economic factors such as the rise in inflation rates and in interest rates during the 1970's, and the volatility of

exchange rates in the 1980's and the 1990's, placed pressures upon the participants in the financial services industry to innovate and to offer more cost-effective products, again strengthening the bargaining position of the industry's customers. An analysis of competition within the financial services industry utilising Porter's (1980) framework shows that rivalry within the industry intensified during the 1980's and 1990's as a result of these developments, with consequent pressures being put upon the rate of return earned by the firms operating in the industry.

As a result of the above trends and developments, the 1990's saw an increasing involvement of non-financial companies in the financial services industry. Thus, the Economist Intelligence Unit (1993) notes that non-financial companies were continuing to enter markets which were the traditional domain of banks. The report states that non-financial companies posed a significant competitive threat to banks and considers competition between banks and non-financial companies to be a key driver for change in the financial services industry. Leach (1994, p.7) adds that the trend towards a blurring of the boundaries between financial and non-financial companies "has accelerated and promises to accelerate even more rapidly in the second half of the 1990's." Later in the 1990's, Taylor (1999) identifies retail multiples such as Tesco and Marks and Spencer who sell financial services through their branches, and operators such as Virgin and Direct Line who sell financial services directly to their customers through television, direct mail or the internet, as major sources of competition for banks and insurance companies.

2.4.4 Summary and Conclusions

It is concluded on the basis of the chronological synthesis of the literature on diversification presented above that the studies reviewed do reveal a pattern of impact that varies with time. Thus, the literature on the general trends in diversification indicates that the move towards conglomeration in the 1950's and 1960's in the U.S. arose primarily due to the rigid antitrust enforcement in those years which did not allow mergers of firms in the same industry and also to the prevailing management philosophy at the time which held that substantial benefits would result from diversification. In the 1980's and 1990's, changes occurred in both of these factors. Studies on diversification showed that the benefits actually derived through this strategy were generally fewer

than had been expected. Furthermore, antitrust policies were relaxed and mergers of firms in the same industry were allowed to take place. The trend towards conglomeration which occurred during the 1950's and 1960's was thus reversed in later years with many firms seeking focus and specialisation in their activities due to a perception that conglomerate diversification does not increase firm value. Thus, during the 1980's and 1990's, a number of major diversified firms in the U.S. and Europe reduced their level of diversification by refocusing on their core business. The firms which were refocusing were those characterised by a relatively high level of diversification and poor performance compared to their industry counterparts. Most of the firms which were refocusing were doing so primarily by divesting unrelated businesses and acquiring related ones.

The literature which is specifically related to the diversification of non-financial companies into the financial services industry also reveals a pattern of impact that varies with time though this pattern is somewhat contradictory to the general trend noted above. Thus, whilst during the 1980's and 1990's firms were generally divesting themselves of unrelated businesses and focusing on their core business, an increasing number of non-financial companies were diversifying into the financial services industry during the period. This may however be explained by the facts that (a) the deregulation of the financial services industry occurred during the 1980's and 1990's and it was previously more difficult for the non-financial firms to enter into the industry (b) developments in ICT during the 1980's and 1990's allowed non-financial firms to take advantage of the synergy and economies of scope existing between their products and resources and those relating to the provision of financial services products and (c) economic factors during the 1980's and the 1990's placed pressures upon the participants in the financial services industry to innovate and to offer more cost-effective products resulting in more competition in the industry. Furthermore, as argued in further detail in Section 3.7, diversification into financial services may represent both a related and a conglomerate form of diversification, depending upon the relationship between a firm's existing assets or activities and the financial services it offers. It is also argued in Section 3.7 that, since by definition the non-financial companies under study in this Thesis are engaged in a moderate amount of diversification into financial services activities, and the literature suggests that a moderate amount of diversification is more likely to be associated with related than with conglomerate diversification,

several of the non-financial companies would be engaged in financial services activities which are in some way related to their existing activities and/or assets. The non-financial companies under study in this Thesis would thus have been acting in accordance with the general trend on diversification during the period analysed in this research (1989 - 1998) insofar as they were focusing on activities related to their core business rather than on conglomerate diversification.

In summary, it is concluded on the basis of the chronological synthesis of the literature on diversification presented above that the studies reviewed do reveal a pattern of impact with respect to the diversification of non-financial companies into the financial services industry that varies with time. However, whilst the studies indicate that the pattern of impact varied during the 1960's, 1970's, 1980's and 1990's, they do not reveal any developments which were specifically related to a particular year or years in the 1990's.

SECTION 2.5: IMPLICATIONS OF LITERATURE REVIEW FOR RESEARCH STUDY

2.5.1 Summary of Literature Review

The entry of non-financial companies into the financial services industry is not a new phenomenon and in the case of some companies goes back to the early part of the last century (Rosenblum and Pavel (1986)). Several reasons have been adduced for this, including the fact that non-financial companies were subject to less regulatory constraints than the commercial banks in terms of the financial services products which they could offer and (in the U.S.) the geographic areas in which they could provide them. The pace of entry of the non-financial companies into the financial services industry has accelerated in recent years, the deregulation of the industry and developments in ICT being amongst the major factors which have contributed to this trend. Industry analysts (for example Leach (1994)) surmise that the exploitation of economies of scope is one of the main factors which has motivated non-financial companies to diversify into the financial services industry.

To understand the reasons for the diversification of non-financial companies into the financial services industry in further depth, the literature on diversification was reviewed extensively in the Literature Review. The most powerful reasons for undertaking a diversification strategy appear to be the exploitation of economies of scope and the reduction of transactions costs since these factors can result in an improvement in a firm's profitability and can thereby lead to an increase in the market value of the firm's shares. Other reasons which have been put forward in favour of diversification include the reduction of risk and an increase in the firm's borrowing power although theoretical considerations indicate that neither of these factors would be expected to affect the market value of the firm's shares. A firm's diversification strategy may also be motivated by the desire of its managers to improve their career prospects and job security. The firm's resources, and particularly its distinctive competencies, have been argued to be of critical importance in the successful implementation of a diversification strategy.

It was argued in the Literature Review that some of the benefits of diversification described above are more likely to arise from a strategy of related diversification whilst others are more likely to result from a conglomerate diversification strategy. Thus, a firm would be more likely to achieve economies of scope if it diversifies into business activities which are closely related to its existing activities since this would facilitate the utilisation of the firm's existing resources in the production and distribution of the new products or services. Also, by substantially reducing the number of transactions a firm makes with its suppliers and/or with its customers, vertical integration is likely to reduce a firm's transactions costs and foster the development of an internal market to a greater extent than the other forms of diversification would. On the other hand, a firm seeking to diversify in order to reduce its management's employment risks, increase its borrowing capacity or reduce its tax burden is likely to select a strategy of conglomerate diversification. However, the benefits which would be expected to arise from a strategy of unrelated diversification would also be expected to arise, albeit to a more limited extent, from a strategy of related diversification. Whichever form of diversification is selected by a firm, severe problems may arise in the integration of the firm's existing activities with its new activities and in the management of the enlarged organisation.

Internal development, merger and acquisition (M & A) and strategic alliances were identified in the Literature Review as the main vehicles through which firms implement diversification strategies. Whilst a firm may enter into a new business area more rapidly through M & A than through internal development, the latter strategy would generally allow the firm to spread its diversification costs over a longer time period and it would also facilitate the integration of the firm's new activities with its existing activities. The main advantage strategic alliances have over the other two methods of diversification is that they are more flexible and easier to set up or to dissolve than the other methods. Whichever diversification method is chosen, particular attention must be paid to the behavioural and cultural problems which may arise when a firm's new and existing activities are integrated to ensure that the diversification strategy is successful.

Several empirical research studies which attempt to investigate the relationship between diversification and financial performance were analysed in the Literature Review. The studies reviewed indicate that conglomerate diversification has not generally resulted in

improvements in firms' performance, with the conglomeration wave which occurred during the 1950's and 1960's being reversed in the 1980's and 1990's when a number of major diversified firms in the U.S. and Europe reduced their level of diversification and refocused on their core businesses. On the other hand, the empirical evidence as to whether related diversification has generally had positive effects upon firms' performance is not conclusive. Whilst the earlier studies on the matter (Rumelt (1974), Bettis (1981)) concluded that a clear relationship existed insofar as the performance of firms which diversified into areas related to their original activities was superior to that of firms which diversified into unrelated areas or which remained specialist, this was disputed by subsequent researchers who held that the performance of the firms in the earlier studies was significantly influenced by the industries to which the firms belonged. Commenting on the empirical research studies carried out on diversification, Grant (1995, p.389) states that "The inconsistency of the empirical evidence on diversification points to the impossibility of generalising about the performance outcomes of diversification." Palich et al. (2000, p.156) sum up the current status of the research on the issue in their observation that "Despite the proliferation of studies on the subject, no clear consensus exists regarding the state of knowledge to date."

An attempt was also made in the Literature Review to synthesise the studies reviewed chronologically to determine whether they revealed any pattern of impact that varies with time with respect to the diversification of non-financial companies into the financial services industry. It was concluded from this analysis that whilst during the 1980's and 1990's firms were generally divesting themselves of unrelated business and focusing on their core businesses, an increasing number of non-financial companies were diversifying into the financial services industry during the period. This paradoxical trend occurred mainly as a result of the deregulation of the industry and the rapid developments in ICT which took place during the 1980's and 1990's. Economic factors such as the volatility of exchange rates also contributed to this trend.

2.5.2 Implications for Research Study

The Literature Review has outlined developments in the financial services industry with particular reference to the increasing involvement of non-financial companies in the industry. Several authoritative industry analysts (Rosenblum and Pavel (1986), Leach

(1994), Taylor (1999)) have recognised the scale and importance of the phenomenon under study and have suggested that the phenomenon will continue to grow in size and significance in future years. A review of the existing literature on the subject under study was made in an attempt to establish the amount of knowledge which already exists on the subject. The literature which was reviewed included both the literature directly related to the phenomenon under study, such as the studies on the competitive analysis of the financial services industry, and also the literature that can provide a theoretical understanding of the phenomenon, namely the literature on diversification and on mergers and acquisitions. Several empirical research studies which investigate the relationship between diversification and financial performance, as well as the literature specifically concerned with the diversification of non-financial companies into the financial services industry, were synthesised chronologically to determine whether the studies reviewed reveal any pattern of impact that varies with time.

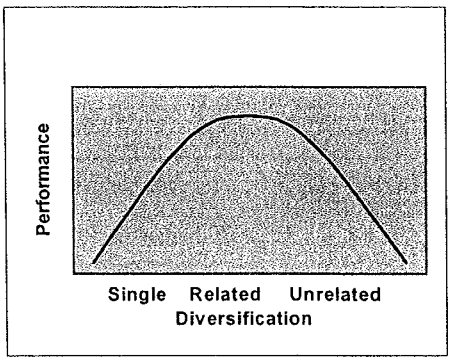
In spite of the fact that, as noted above, the phenomenon under study has been recognised as being of major size and significance by several authoritative industry analysts, the existing body of knowledge on the subject is quite limited. The studies which focused specifically upon the phenomenon (for example, Aguilar (1990), Leach (1994), Lascelles (1999)) were descriptive in nature and did not utilise the rigorous methodological approach employed in the academic empirical research studies on diversification discussed in the Literature Review. None of the academic works reviewed specifically attempted to examine the relationship between the entry of non-financial firms into the financial services industry and the financial performance of these firms. Yet as Grant (1987, p.2) points out, "The financial services industry provides a particularly fertile field for such a study (as)...innovation, growth and regulatory change have provided a spectacular impetus for diversification." Grant's (1987) study was itself limited in scope, however, insofar as it only focused on a sample of six financial conglomerates and did not attempt to examine the wider issue of the diversification of non-financial firms into the financial services industry.

The discussion on diversification has revealed that, although it would be expected that firms would benefit by diversifying into related areas of activity since this would give them the opportunity to reap economies of scope and to reduce their transactions costs, the empirical research evidence does not conclusively demonstrate that related

diversification has generally had a positive effect upon firms' performance. On the other hand, theoretical considerations indicate that conglomerate diversification would not be expected to significantly improve firms' performance and the empirical evidence generally corroborates this expectation. The trend towards refocusing in recent years provides further evidence that many firms derived fewer benefits from diversification than were expected.

Summing up the results of the research on the links between diversification and financial performance which has been carried out over the last thirty years, Palich et al. (2000) confirm that no clear consensus exists regarding the state of knowledge on the matter. However, the authors conclude on the basis of a "meta-analytic" study of past research they carried out that the balance of the evidence on the issue indicates that firms' financial performance would be expected to improve as they diversify into related activities but then deteriorate as they diversify further into unrelated activities, as illustrated in Figure 2.4. This is because firms which have diversified into related activities would be in a good position to reap synergy and economies of scope from their activities but as they diversify further into unrelated activities, it becomes more difficult to obtain these benefits and also to manage the more complex organisation leading to diminishing returns from the increased level of diversification. The authors equate related and unrelated diversification with a moderate and high amount of diversification respectively.

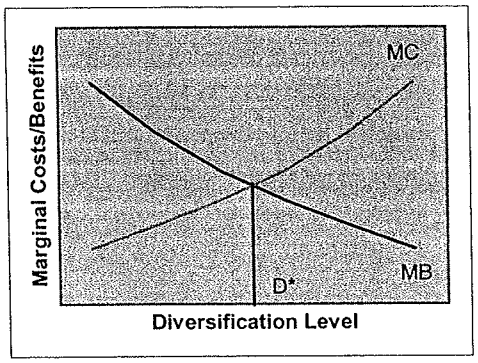
FIGURE 2.4: DIVERSIFICATION HYPOTHESIS (PALICH ET AL.(2000))



Markides (1993, 1995) supports Palich et al.'s (2000) observations hypothesising that, as a firm diversifies, the additional benefits it can derive from diversification decline whilst the costs of diversification increase, as illustrated in Figure 2.5. The latter may

occur due to diseconomies of scale which can arise for various reasons such as the increasing difficulty of managing the firm as its size and diversity increase. The author suggests that this implies that there is an optimal limit (D* in Figure 2.5) with regard to how much firms should diversify and any diversification beyond this limit may be considered to be excessive.

FIGURE 2.5: DIVERSIFICATION HYPOTHESIS (MARKIDES (1993, 1995))



In view of the lack of conclusive evidence in the literature as to whether any benefits have been derived through diversification in practise, it appears paradoxical that a number of non-financial companies have diversified into the financial services industry and further research into this phenomenon is indicated in order to establish whether these companies have in fact derived any financial benefit by diversifying into the industry. The developments in the financial services industry outlined in the Literature Review have resulted in several opportunities for diversification into and within the industry which Grant (1987) describes as "spectacular" and the industry should thus provide extensive and fertile material for such a study on diversification. Although it may appear paradoxical that a substantial degree of diversification has taken place in the financial services industry whilst companies in other industries were refocusing, this may be explained by the fact that, as discussed in the Literature Review, the lowering of the barriers to entry in the financial services industry due to the deregulation of the industry has occurred relatively recently. The rapid developments in ICT which took place in recent years and economic factors such as the volatility of exchange rates also contributed to this trend.

2.5.3 Research Question

The discussion in this Chapter leads to the formulation of the research question of this Thesis, namely:

Does diversification into the financial services industry significantly improve the financial performance of non-financial companies which diversify into the industry?

The research which will be carried out to answer the research question is expected to throw further light upon the effects of diversification on firms' performance and thus contribute towards resolving the unsettled state of the literature on the matter.

CHAPTER 3: METHODOLOGY

3.1 Introduction

In the previous Chapter, the research question being investigated in this Thesis was formulated as:

Does diversification into the financial services industry significantly improve the financial performance of non-financial companies which diversify into the industry?

The research methodology used in this study to investigate the research question is outlined in this Chapter. Research methodology is discussed in general terms in Section 3.2 and this is followed in Section 3.3 by a description of relevant quantitative methods and techniques. Finance and accounting issues related to the subject-matter of the Thesis are examined in Sections 3.4 and 3.5 respectively following which the design of the research study is outlined in Section 3.6. Finally, the research hypotheses are developed and formulated in Section 3.7 and a summary of the Chapter is provided in Section 3.8.

3.2 Research Methodology

There are two main philosophical positions from which research methods in the social sciences may be derived, namely the positivist position and the phenomenological position (Easterby-Smith et al. (1993)). Positivism follows in the scientific tradition and holds that the social world exists externally and that its properties can be explained by universal theories and laws and measured by objective methods. The phenomenological position, on the other hand, takes the view that the social world is constructed by the subjective experiences of the human beings which compose it and that its properties can therefore only be inferred subjectively through experience and observation.

The research methods and techniques used by a researcher depend largely upon the philosophical standpoint (or paradigm) he or she adopts. A researcher who adopts the positivist paradigm would tend to focus on facts, operationalise concepts, and test hypotheses in order to reach conclusions. Such a researcher is therefore likely to adopt research methods which complement working in this paradigm such as experiments and simulations. Quantitative research techniques are also likely to be used. Working within the phenomenological paradigm, on the other hand, a researcher would tend to develop ideas through observation and attempt to establish different views of the phenomena under study in order to eventually generalise about them. The researcher is therefore more likely to adopt research methods such as action research and case studies and to utilise qualitative research techniques.

McGrath (1982) observes that there is no one true method, or correct set of methodological choices, that will guarantee success in a research study. Whilst it is desirable to maximise (a) generalisability with respect to populations (b) realism of context and (c) precision in control and measurement in any research study, this is not possible in practice and the author demonstrates that any research method that maximises any one of these factors will reduce the other two. Thus, for example, whilst case studies may maximise realism of context, they are relatively weak with respect to generalisability and precision in control and measurement. On the other hand, laboratory experiments are strong in terms of precision in control and measurement at the cost of generalisability and realism of context. In any research study, therefore, a choice must be made from amongst a number of research designs each having different strengths and weaknesses and Easterby-Smith et al. (1993) conclude that this choice rests ultimately with the researcher and the aims or context of the research study.

The author's orientation and training lead him to adopt a positivist stance in this Thesis whereby it is held that the properties of the business phenomena under study can be measured by objective methods and that conclusions on these phenomena can be reached by using these methods. The research method used in the Thesis is a form of the experimental method, namely the quasi-experimental method which, as discussed in further detail below, is an appropriate research design for the investigation of the research question of this study.

The experimental design is often employed in empirical research studies concerned with investigating the relationship between variables. Variables are defined by Heiman (1992) as anything which, when measured, can produce two or more different values or scores and examples of variables are age, gender, share prices, sales values and so on. Variables may be classified as independent and dependent. Frankfort-Nachmias and Nachmias (1992) define independent variables as those which are expected to explain changes in the values of dependent variables whilst dependent variables are defined as those whose variations in value the researcher wishes to explain. To establish the relationship between variables, a researcher adopting the experimental method begins by formulating a hypothesis predicting the relationship between the variables and then collecting data to test that hypothesis. A hypothesis may be defined as a conjectural statement or educated guess about the relationship between the variables (Cohen and Manion (1994)).

In the "pure" experimental design, the researcher seeks to test his or her hypothesis by manipulating the independent variable or variables whilst holding constant all the other factors (the extraneous factors) which could affect the dependent variable or variables (Brown and Melamed (1993)). Changes in the values of the dependent variable or variables would then be held to be caused by changes in the independent variable or variables. Spector (1993) emphasises that the control of extraneous factors is the cornerstone of the experimental design and one way of achieving this is to set up two groups of subjects, an experimental group and a control group. Subjects are assigned to each of the two groups at random, thus ensuring the comparability (or equivalence) of the two groups. The independent variable or variables are then manipulated in the experimental group but not in the control group and, provided all other factors are kept constant, any changes in the values of the dependent variable or variables in the experimental group which are not also reflected in the control group would be held to be caused by the changes in the independent variables.

In the financial field it is not usually possible to utilise the "pure" experimental design since, as Ryan et al. (1992) observe, it is not generally possible for the researcher to manipulate the independent variable or variables directly and furthermore it may not be possible to assign subjects at random to an experimental or control group. Many of the research designs in the field are thus of a quasi-experimental nature in which the

experimental and control groups studied are chosen by means other than random selection and the groups' conditions are not directly manipulated by the researcher. Whilst randomisation procedures in the selection of the experimental and control groups ensure the greatest likelihood of equivalence between the two groups, matching is a recognised technique to employ in circumstances where subjects cannot be assigned at random to an experimental or control group (Ryan et al. (1992), Mitchell and Jolley (1996)). This would be the case, for example, in research studies where the effects of the independent variable or variables upon the dependent variable or variables have already occurred. When the matching procedure is used in such studies, the subjects in the control group should ideally be identical to those in the experimental group except insofar as the latter were subjected to the effects of the independent variable or variables whereas the former were not. The authors recognise that this is not possible in practise, however, and suggest that matches should be made on the basis of the most important extraneous variables. Ryan et al. (1992) warn that failure to match adequately would threaten the internal validity of the study and the authors also note that a decrease in sample size by a factor of 10 or 20 can occur as subjects are matched. The latter observation is also made by Spector (1993) who notes that in a study made by Chapin (1955), the original sample of 1194 shrunk to only 46 after matching.

Frankfort-Nachmias and Nachmias (1992) point out that reliability and validity are key concepts in research design. Reliability, which is defined by Spector (1993) as the consistency of a measurement instrument, asks whether the instrument always comes up with the same score or number when the true value is the same. Thus a valid ruler always finds that the same table has the same length. Validity means that an instrument measures what it is designed to measure. Thus a valid ruler measures length and a valid stopwatch measures time. Drawing upon Campbell and Stanley (1963), Cohen and Manion (1994) observe that there are two types of validity of relevance in experimental designs, namely internal validity and external validity. Internal validity is concerned with whether observed changes in the dependent variable or variables are in fact caused by the independent variable or variables. The main threats to internal validity include (a) history, when events other than the experimental treatments occur during the experiment and affect the dependent variables (b) maturation, when subjects change during the experiment (c) selection, when bias arises due to the method of selection of the subjects (d) mortality, when subjects drop out during the experiment (e) instrumentation, when

the instruments used are unreliable or invalid and (f) testing, when pre-testing sensitises subjects to the experiment. The authors conclude that the internal validity of an experiment determines whether valid conclusions can be drawn from the study and add that an experiment cannot be externally valid unless it is internally valid.

Cohen and Manion (1994) continue that external validity refers to the extent to which the results of an experiment may be generalised to other settings or samples. The main threats to external validity include (a) if the independent variable or variables are inadequately described and the experiment thus cannot be replicated (b) if the subjects in the experiment are not representative of the population to which the results are generalised (c) if the results of a study at a particular point in time cannot be generalised to other periods of time (d) if the subjects in the experiment behave differently because they know they are part of an experiment and finally (e) the effects of (a) to (d) may interact with one or all of the factors relating to internal validity. Endorsing McGrath's (1982) views outlined above, Mitchell and Jolley (1996) observe that internal and external validity may conflict insofar as the procedures which increase internal validity such as greater control over extraneous factors may decrease the generalisability of the study. Ryan et al. (1992) suggest that in fundamental research internal validity is of prime importance whilst in applied research external validity is also important and a researcher must decide in which dimension to optimise.

As McGrath (1982) points out, all research designs have particular strengths and weaknesses and this observation also applies to the quasi-experimental method. As noted above, the quasi-experimental method is an appropriate research design to employ in circumstances where it is desired to utilise the experimental method but the effects of the independent variable or variables upon the dependent variable or variables have already occurred and it is not therefore possible to select the subjects in the experimental and control groups at random or to directly manipulate the groups' conditions. However, as a result of the reduced level of control in the quasi-experimental method, the researcher may be less certain that changes in the dependent variable or variables were caused by the independent variable or variables than would be the case in the "pure" experimental design.

As noted above, a hypothesis may be defined as a conjectural statement or educated guess about the relationship between variables (Cohen and Manion 1994). When carrying out an experiment, a research hypothesis is formulated which predicts the relationship between the variables that the experiment is expected to demonstrate. Having formulated the research hypothesis, this is translated into statistical hypotheses which can be tested using inferential statistics, as described in further detail in Section 3.3. Frankfort-Nachmias and Nachmias (1992) point out that two statistical hypotheses emanate from the research hypothesis: the null hypothesis (Ho) which states that changing the independent variable or variables will *not* produce the predicted difference in the dependent variable or variables and the alternative hypothesis (Ha) which is supported when the null hypothesis is rejected as being unlikely. These hypotheses are two-tailed if the direction in which the dependent variable's score will change as the independent variable or variables change is not predicted and one-tailed if the dependent variable's score is predicted to change in a certain direction as the independent variable or variables change. Two types of errors may be made when statistical hypothesis testing is carried out, namely Type I errors which occur when Ho is rejected when it is true and Type II errors which occur when Ho is accepted when it is false (and Ha is true).

3.3 Quantitative Methods and Techniques

As previously noted, variables may be defined as anything which, when measured, can produce two or more different values or scores and they may be classified as independent or dependent (Heiman (1992)). Variables may also be classified as quantitative or qualitative: quantitative variables are those which can be measured in amounts such as height or weight whilst qualitative variables are those which cannot be measured in amounts but rather classify subjects on the basis of a characteristic or category such as gender. Weisberg (1993) observes that there are four types of scales on which variables can be measured - nominal, ordinal, interval and ratio. Nominal scales are used to identify the categories of a qualitative variable and thus, for example, the number "1" may be used to denote a male subject whilst "2" denotes a female subject. Ordinal scales are used to indicate rank order and thus a variable to which a "1" is assigned would rank before (or after) a variable to which a "2" is assigned. Interval and ratio scales both measure actual amounts and there is a defined unit of measurement

separating each score. They differ insofar as interval scales (such as temperature scales) have an arbitrary zero point whereas ratio scales (such as weight scales) have an absolute zero point.

When conducting research studies, it is not usually possible to include each and every member of the population under study in the research. Instead, a sample is drawn from the population and inferential statistics are used to draw conclusions about the population from the sample data. Siegel (1956) points out that there are two types of inferential statistics - parametric and non-parametric. Parametric statistics are procedures that require certain assumptions about the characteristics (or parameters) of the population represented by the sample data such as that the population is normally distributed. The data used in parametric procedures are usually interval or ratio data most appropriately described by the mean. Non-parametric statistics, on the other hand, do not require such stringent assumptions about the characteristics of the population represented by the sample data and are therefore useful when the data violate the assumptions required by parametric procedures. The data used in non-parametric procedures are usually nominal or ordinal data but these procedures are also useful in the case of skewed interval or ratio data most appropriately described by the median or mode. Kazmier (1988) notes that the power of a statistical test may be defined as the probability of avoiding a Type II error which, as noted above, occurs when the null hypothesis is accepted when it is false. If the use of a parametric test is warranted, it is always preferable to use such a test rather than its non-parametric equivalent since, if the same level of significance is used for both tests, the power associated with the former is always greater than that associated with the latter.

Heiman (1992) observes that the t-test for related samples (or paired sample t-test) is a parametric procedure suitable for hypothesis testing when each subject in a group is matched with a subject in another group. The Wilcoxon signed ranks test is the non-parametric equivalent of the paired sample t-test. The paired sample t-test assumes that the sample scores being tested are normally distributed though the test is still dependable if the data only approximate a normal distribution. The variables being tested must be on the interval or ratio scale. The t-test is carried out by first computing the difference between the scores of each pair of subjects in the two groups to obtain a difference score for each pair D. The t statistic for N-1 degrees of freedom for the distribution relating to the difference scores D is then obtained using the formula:

$$t = \frac{\overline{D} - \mu_D}{s_{\overline{D}}} = \frac{\overline{D} - \mu_D}{\sqrt{\left(s_D^2\right)\left(\frac{1}{N}\right)}}$$

Where:

$\overline{D}$ = the mean of the difference scores D

μ_D = the mean of the population of difference scores (assumed to be zero)

$s_{\overline{D}}$ = the standard error of the mean difference

s_D^2 = the estimated variance of the population of difference scores

N = the number of difference scores

As noted above, the Wilcoxon signed ranks test is the non-parametric equivalent of the paired sample t-test. No assumptions are made about the forms of the data distributions but the variables being tested must at least be on the interval scale. In the Wilcoxon signed ranks test the difference between the scores of each pair in two groups is computed and the absolute values of the differences are ranked from lowest to highest, with the rank of 1 being assigned to the smallest absolute difference. The sum of the ranks is then obtained separately for the positive and negative differences with the smaller of these two sums being the Wilcoxon T statistic. Siegel (1956) points out that when N is greater than 25, the T statistic is approximately normally distributed and the z statistic may be computed using the formula:

$$z = \frac{T - \frac{N(N+1)}{4}}{\sqrt{\frac{N(N+1)(2N+1)}{24}}}$$

Where:

T = the smaller of the sums of like-signed ranks

N = the number of pairs with a difference which is $\neq$ zero

When N is less than or equal to 25, the critical values for the Wilcoxon T statistic at different probability levels may be obtained by reference to the appropriate statistical Table.

The purpose of the two statistical procedures outlined above is to test the null hypothesis that there is no difference between the mean (in the case of the paired sample t-test) or the median (in the case of the Wilcoxon signed ranks test) scores registered by the subjects in an experimental group and the scores registered by the subjects in a control group. When a sample is drawn from a population, differences between the sample values and the population values they represent are likely to occur as a result of chance factors (or sampling error) due to the fact that only a portion of the population is included in the sample. In the tests, the difference in the scores registered by the two groups is held to be statistically significant if, at a given probability level, it is unlikely that the difference in the two groups' scores is caused by sampling error. Rather, it would be held to be more likely that the two groups represent different populations having different scores. In these circumstances, the null hypothesis is rejected at the given probability level and the alternative hypothesis accepted. It must however be noted that rejection of the null hypothesis does not *prove* that the alternative hypothesis is correct since it is always possible, albeit highly unlikely, that the difference in the two groups' results is caused by sampling error.

3.4 Finance Issues

As discussed in Section 2.2.2, financial markets exist in order to facilitate the transfer of funds between individuals and institutions having funds to invest and individuals and institutions requiring those funds. These markets must operate efficiently in order to ensure that financial instruments can be bought and sold at a fair price, an efficient financial market being defined by Fama (1970) as one in which stock prices always fully reflect the information available to the market. The author puts forward three hypotheses of market efficiency which are differentiated according to the degree of information available to the market, namely:

(i) weak-form efficiency in which current market prices reflect historical price information.

(ii) semistrong-form efficiency in which current market prices also reflect all other information that is publicly available.

(iii) strong-form efficiency in which market prices are also influenced by information which is only available to certain individuals or groups.

Amongst the main implications of an efficient financial market are that (Fama (1970), Alexander et al. (1993), Leroy (1990)):

- securities are fairly priced, the market price of a security being equal to the present value of its future cash flows.

- market prices immediately and fully reflect any new information which becomes available to the market.

- no investor possesses information which is not also available to the market and there are thus no opportunities for any investor to earn excess (or abnormal) returns. Thus, for example, in the weak-form version of the efficient market hypothesis, it would not be possible for an investor to make abnormal profits by basing investment decisions on past prices.

A large amount of research has been carried out with respect to each of the three hypotheses of market efficiency and Fama (1970) points out that the results of tests of the weak-form and semistrong-form hypotheses supported these hypotheses whilst there was less evidence to support the strong-form hypothesis. Reviewing the results of a number of research studies several years later Fama (1991) again concludes that the evidence supported the hypotheses that current market prices reflect historical price information and that the prices react rapidly to publicly available information about a company's activities. However, evidence to support the strong-form hypothesis of market efficiency remained sparse.

Whilst the notion that stock prices reflect the available market information to a greater or lesser degree is generally accepted amongst finance theorists, some anomalies to all forms of market efficiency have also emerged. These include De Bondt and Thaler's

(1985) findings which tested the hypothesis that investors tend to overreact to recent information and underreact to prior data. The authors divided U.S. stock portfolios into "winners" and "losers", the former being portfolios of stocks which demonstrated abnormal positive stock returns shortly after their formation whilst the latter demonstrated abnormal losses. De Bondt and Thaler (1985) found that the two portfolios' initial abnormal positive returns or losses were followed by subsequent movements in the opposite direction and conclude that these findings confirmed their hypothesis that investors had systematically overreacted to the most recent information on the stocks' performance. Extending De Bondt and Thaler's (1985) research, Jegadeesh and Titman's (1993) study indicates that contrarian strategies (buying past losers and selling past winners) would have resulted in the realisation of significant abnormal positive returns in the 1965 - 1989 period whilst Lakonishok et al. (1994) conclude that "value" investment strategies outperformed "glamour" investment strategies between 1968 and 1990. The former strategies call for investment in stocks which have low prices relative to other indicators of their value whilst the latter strategies aim to invest in stocks which have done well in the past and are expected to continue to perform well in the future.

Another anomaly that has been the subject of several research studies in recent years is the poor post listing performance of new equity (both Initial Public Offerings (IPOs) and Seasoned Equity Offerings (SEOs)). Ritter (1991) compared the stock returns from 1526 U.S. IPOs over a three-year period commencing from the end of the first day of trading to the returns from a sample of match firms over a similar time period. The author concludes that the IPOs' performance was significantly worse than that of the match firms over the period and hypothesises that this may have occurred because the market overestimated the IPOs' growth opportunities. Levis (1993) carried out a similar study in the U.K., comparing the performance of 712 IPOs with benchmark indices and also concludes that the level of underperformance by the IPOs was statistically significant. The author adds that similar results were obtained in research studies in other countries such as Germany and Finland. Spiess and Affleck-Graves (1995) examined stock returns following SEOs made in the U.S. between 1975 and 1989 and found that Ritter's (1991) conclusions also held for SEOs. When the stock returns of 974 firms which had carried out SEOs were compared with those of match firms over three and five-year periods, in both cases commencing from the end of the first day of

trading of the SEOs, the former firms' stocks were found to have underperformed in both time periods. The authors hypothesise that this may have occurred as a result of the SEO firms being able to take advantage of firm-specific information to issue equity when their stock was overvalued.

Other anomalies to the concept of an efficient stock market have also emerged, including the January effect (De Bondt and Thaler (1985)), the share repurchase effect (Lakonishok and Vermaelen, (1990)), the listing effect (Dharan and Ikenberry, (1995)) and the cash dividend initiation and omission effect (Michaely et. al, (1995)). These and other anomalies have challenged the basic tenets of the efficient market hypothesis since as Ritter (1991, p.4) observes, "the existence of price patterns may present opportunities for active trading strategies to produce superior returns". However, notwithstanding the detection of various anomalies, the hypothesis that stock markets are generally efficient remains one of the key concepts of modern finance theory (Mills, 1998) and the status of the research on the matter is aptly summed up by Rees (1995, p.40) who remarks that "the bulk of the efficient market hypothesis research has supported the case for an efficient market. The efficient market theory is a sound working assumption where the analyst has no reason to believe otherwise." The author cautions however that there is also sufficient cause for doubt and any evidence suggesting that the market is less than efficient should be seriously considered.

On the basis of the foregoing, it is assumed in this Thesis that stock markets are generally efficient in the semistrong-form insofar as, provided that timely and accurate information is available to the markets, market prices should, particularly in the longer-term, be fair estimates of the securities' true value i.e. of the present value of their future cash flows. Similar views were expressed in two D.B.A. Theses recently presented to Henley Management College / Brunel University, namely those by Kennedy (1997) and Finnegan (1999). Kennedy (1997, p.94) states that "...given 'good' information to the market, stocks are normally fairly priced and reflect an approximate current value based on the expected firm's lifetime cashflow." Finnegan (1999, p.51) adds "...it is concluded that the market is efficient in so far as market prices are unbiased estimators of the true value of the investments."

The Capital Asset Pricing Model (CAPM) has been discussed in detail in Section 2.3.3.4 of the Literature Review. It was noted that in the CAPM systematic risk (beta) plays an important part in establishing the rate of return investors expect to earn from a firm's securities and thus in the determination of the market price of the firm's securities. It was however also noted that criticism has been levelled at the CAPM, particularly on the grounds that the empirical evidence indicates that beta may not adequately capture all the elements of market risk and that consequently the CAPM does not describe the risk-return relationship satisfactorily (Mills (1994)). Fama and French (1992) reviewed the empirical work carried out on the issue and report that the evidence indicated that a firm's size (expressed as market capitalisation), leverage, market-to-book ratio, and price-earnings ratio also helped to explain the average return on U.S. stocks. The authors thus carried out a study to evaluate the roles of these four factors and of firms' betas in the determination of the average returns on the stocks of non-financial U.S. companies between 1941 and 1990. Financial companies were excluded from the study on the grounds that high leverage is normal for these firms and is not therefore an indicator of financial distress as may be the case for non-financial firms.

The authors report that whilst previous studies by Black et al. (1972) and Fama and Macbeth (1973) found a positive simple relationship between beta and average stock returns between 1926 and 1968, this relationship disappears during the 1963 - 1990 period. Furthermore, the authors found that the relationship was weak during the 1941 - 1990 period. Fama and French (1992, p.429) also found that in the 1963 - 1990 period, the combination of size and market-to-book ratio "...provide a simple and powerful characterization of the cross-section of average stock returns" and that these two factors absorbed the roles of leverage and price-earnings ratios in explaining returns. The authors thus suggest (p.452) that "...the performance of managed portfolios...can be evaluated by comparing their average returns with the average returns of benchmark portfolios with similar size and BE/ME characteristics." Fama and French (1992) conclude by stating that, whilst their results were consistent, they did not have a satisfactory economic explanation for the roles of market capitalisation and market-to-book ratios in the determination of average returns, except that these two factors could act as proxies for underlying market risk factors and the authors suggest that further research into the matter was necessary. Fama and French's (1992) conclusions were

contested by researchers such as Kothari et al. (1995) who argued that the former authors' conclusions were affected by sample selection bias but this criticism was rebutted by Fama and French (1996b) and Barber and Lyon (1997b) whose findings (discussed below) supported those reached by Fama and French (1992).

As noted above, Fama and French (1992) excluded financial firms from their study on the grounds that high leverage had different implications for financial and non-financial firms. Barber and Lyon (1997b) conducted a study on the financial companies excluded by Fama and French (1992) to test the robustness of the latter's results arguing that, since size and market-to-book ratio, rather than leverage, had emerged as the strongest predictors of stock returns, there was no reason to differentiate between financial and non-financial firms with respect to the determinants of stock returns. Barber and Lyon (1997b) identified the financial firms from the Standard Industrial Classification (SIC) codes and confirmed Fama and French's (1992) findings, stating that (p.883) "...the relation between size, book-to-market, and security returns is similar for financial and nonfinancial firms." However, Barber and Lyon (1997b) conclude that a critical issue which still remained unresolved was that of finding a satisfactory economic explanation for the roles of market capitalisation and market-to-book ratio in the determination of stock returns.

3.5 Accounting Issues

Accounting is defined by Choi et al. (1999) as a branch of applied economics that provides information about business and financial transactions for users of that information. Several individuals and institutions are interested in obtaining, analysing and interpreting business and financial information and, in the case of companies' activities, these include investors, creditors, employees and Government Authorities such as the Tax Authorities. The Income Statement (or Profit and Loss Account (P&L)), Balance Sheet and Cash Flow Statement are the main vehicles of information on the economic activities of companies (Pendlebury and Groves (1994)). The Income Statement provides information on a company's income and costs over a period of time whilst the Balance Sheet gives information on a company's assets and liabilities at a point in time. The Cash Flow Statement reports on a company's cash receipts and payments over a period of time. The fundamental purpose of the three accounting

statements is to provide information on a firm's value at a point in time (as reported in the Balance Sheet) and on changes in the firm's value over periods of time (as reported in the Income Statement) with the Cash Flow Statement providing links between the two other statements. Although the statements' fundamental purpose is the same in all companies and countries, substantial differences arise in the manner in which the information contained in the statements is presented and treated in different countries and in different companies primarily as a result of the different legal, economic and financial structures which exist in different countries.

The legal systems adopted by different countries vary considerably, a fundamental difference arising between the legal systems of countries such as Italy and France which have adopted systems based on "civil law" concepts in which rules are codified and relatively inflexible and the legal systems of countries such as the U.S. and Australia where "common law" systems allow greater flexibility in the formulation, interpretation and application of the law (Nobes and Parker (1998)). In the former countries, accounting rules and regulations tend to emanate from codified law whilst in the latter countries accounting bodies and practitioners tend to have greater influence on the formulation and application of accounting rules and regulations. Furthermore, the "common law" legal systems provide shareholders and creditors with a greater degree of protection than the "civil law" systems (La Porta et al. (1997)), which partly explains why different economic and financial structures have evolved in different countries. In countries such as the U.S. and the U.K. where shareholders and creditors are afforded a relatively high degree of protection by the law, many companies obtain finance from a wide spread of shareholders whereas in countries such as Germany and France where shareholders and creditors are less protected, shareholdings in companies are more concentrated with a significant amount of financing being provided by banks, government and the companies' founding families. As a result of the different share ownership structures, there is greater pressure for the public disclosure of company information and the external audit of companies' activities in the "common law" countries than in the "civil law" countries with a consequent effect on the accounting practices in these countries.

The differences in the accounting practices existing in different countries may be illustrated by reference to the positions in the U.K. (a common law country) and

Germany (a civil law country). In Germany, the rules governing accounting statements are laid down by legislation and the treatment of accounting items in the "commercial" accounts is required to be the same as in the "taxation" accounts. In consequence the revaluation of fixed assets, for example, is not allowed and depreciation rates are based on tax allowances. Also, since companies' shareholders are generally relatively concentrated, the information disclosed in companies' reports tends to be restricted to legal requirements (Choi et al. (1999)). In the U.K. on the other hand, whilst companies must generally comply with the Financial Reporting Standards issued by the Accounting Standards Board, they are allowed greater latitude in the treatment of items such as the capitalisation of costs and the revaluation of fixed assets in their financial statements. However, U.K. companies are required to disclose more information about their activities and accounting policies than is generally the case in "civil law" countries. The disparity which exists between the accounting systems in different countries has led to attempts to harmonise the systems and an International Accounting Standards Committee and other similar bodies have been set up in this regard but a limited amount of progress has been achieved to date. It should however also be noted that, although there are differences between the accounting systems used in different countries, several similarities also exist. Thus, Damodaran (1999) points out that in a survey of accounting practices in a number of developed countries, Choi and Levich (1990) found that most countries subscribe to the same basic accounting principles such as consistency in the application of accounting methods, accounting on an accruals basis and the application, unless otherwise justified, of the historical cost convention.

The accounting systems currently in use have been criticised in several respects. Apart from criticisms relating to the differences which exist between the accounting practices of different countries and different companies as described above, accounting statements have also been criticised on the grounds that the information they contain is insufficient or misleading for shareholders' and management's purposes. The main objective of most companies' shareholders is to maximise the return they obtain from their investment in the firm, return being measured by the dividends the shareholders receive plus the increase (or decrease) in the company's share price (Rappaport (1998)). A company which seeks to satisfy this objective for its shareholders should thus implement strategies and take decisions aimed at maximising the market value of its shares (Damodaran (2001)). As discussed above, in an efficient financial market a

company's share price would reflect the present value of its future cash flows and a firm seeking to maximise the market value of its shares would thus aim to maximise the present value of its future cash flows.

Accounting statements in their traditional format do not provide the information needed to help achieve this objective, however, primarily because the statements are constructed under accounting conventions such as the accruals, historical cost and prudence concepts and do not take account of certain factors which are of critical importance in evaluating a company's past performance and future plans. These factors include (a) the investment in fixed and working capital needed to sustain a firm's future development (b) the time value of the money invested in the company and (c) the risks attached to a firm's current and future operations (Mills (1998)). A further criticism which has been made of accounting statements is that they are susceptible to "creative" accounting which takes place when a judicious choice of accounting policies shows a firm's results in a better light, often by transferring costs from the Income Statement to the Balance Sheet (Rees (1995)). This may be achieved by, for example, capitalising interest costs or reducing depreciation rates.

Due to the shortcomings of the information contained in accounting statements for shareholders' and management's purposes, alternative methods of preparing and presenting financial information have been suggested in recent years, including the Economic Value Added (EVA) approach advocated by Bennett Stewart (1991) and the Shareholder Value Analysis (SVA) approach proposed by Mills (1994, 1998). Essentially, the alternative methods assess a company's performance and future plans on the basis of their contribution to the creation of shareholder value (as expressed by the present value of the firm's future cash flows). Taking the EVA approach as expounded by Bennett Stewart (1991) as an example, this is achieved by first making adjustments to certain items in the accounting statements which are deemed to distort the economic realities of a company's operations. These include items such as deferred income tax provisions and amortised goodwill which are added back to earnings, and research and development expenses which are capitalised and amortised rather than being charged to income as they are incurred. An adjusted figure for NOPAT (Net Operating Profit After Tax) is then obtained from which a charge for capital is deducted to obtain a residual positive (or negative) amount representing the economic value

added (or destroyed) by the company. The charge for capital is computed by applying the company's Weighted Average Cost of Capital (the weighted average cost of shareholders' and debt capital, expressed in percentage terms) to the company's invested capital (shareholders' equity plus all interest-bearing debt). EVA is linked to the market price of a company's shares insofar as, when EVA is projected and discounted to a present value, it is equivalent to Market Value Added (MVA) which, assuming that the market and book value of a company's debt capital are the same, represents the difference between the market and book value of a company's share capital.

Although the EVA and similar approaches towards preparing and presenting financial information have been adopted by a number of companies in recent years, criticisms of these approaches have also been made. Thus, in a study carried out on 773 firms for which EVA data was available, Biddle et al. (1997) concluded that there was little evidence to support claims that stock returns and firms' market values were more closely associated with EVA than with the earnings information disclosed in accounting statements. Rather, the opposite was the case and earnings information outperformed EVA in explaining stock returns and firms' market values. Young (1997) comments that more than 100 possible EVA adjustments have been identified which can make the system impossibly complicated to administer and to communicate to management. The author thus recommends limiting the adjustments to those which are significant and are comprehensible to non-financial managers.

As noted above, the fundamental purpose of a company's accounting statements is to provide information on a firm's value at a point in time and on changes in the firm's value over periods of time. As also discussed above, the market price of a company's shares provides similar information insofar as the market price reflects the value of the shareholders' investment in the firm at a point in time and changes in the market price reflect changes in the value of the shareholders' investment over periods of time. Since the accounting statements purport to measure a firm's value and changes in its value and, notwithstanding the limitations of the information they contain, the statements are widely used by analysts and others to evaluate and comment upon companies' financial performance, it would be expected that an association would exist between the information contained in a firm's accounting statements and the market price of its

shares. Reviewing the extensive research which has been carried out on this issue, Rees (1995) observes that in a seminal article Ball and Brown (1968) found that, whilst a substantial part of the information contained in companies' accounting results was incorporated in companies' share prices well before the accounting information was disclosed, the actual publication of the accounting results also influenced the share prices. Rees (1995) adds that later researchers such as Beaver et. al (1979) and Firth (1981) came to similar conclusions with Firth (1981, p.528) concluding that "although earnings announcements are anticipated to a large extent by the stock market, the actual release of the figures still results in substantial additional information being given." As noted above, it has also been shown (Biddle et al. (1997)) that the traditional accounting measures of financial performance outperform alternative measures in explaining stock returns and firms' market values.

As noted above, notwithstanding the limitations relating to the information contained in companies' accounting statements, the statements are widely used by analysts and others to review and form opinions about companies' financial performance. A common method of doing this is to carry out a ratio analysis whereby the analyst compares one or more items in a company's accounting statements at a certain point in time or over periods of time. Comparisons may also be made between the items in a company's accounting statements and the items in the accounting statements of other companies (Sizer (1989)). When carrying out ratio analysis, a pyramid of ratios may be drawn up culminating in Return on Gross Assets, Return on Net Assets and Return on Equity. These ratios summarise the information on a company's financial performance contained in a number of other ratios at lower levels of the pyramid. Whilst ratio analysis has been shown to be of value for certain analytical purposes such as the prediction of corporate bankruptcy (Altman (1968)), the analysis must be carried out with caution due to the limitations inherent in the accounting data upon which the ratios are based. Additionally to the limitations which have been noted, a further problem which may arise when analysing accounting ratios is the presence of observations having extreme values (or outliers) which may distort statistical summaries of the ratio data. To minimise these problems, Rees (1995) and Choi et al. (1999) recommend that the analyst should attempt to standardise the accounting data used in ratio analysis to eliminate differences in the accounting methods used by different companies as far as possible. Furthermore, he or she should exercise caution in the interpretation of the

economic and financial implications of the ratio data, comparing the conclusions reached from the ratio analysis with those indicated by other sources. The use of non-parametric statistical procedures to deal with the problem of extreme values is also recommended.

3.6 Design of Research Study

The research question being investigated in this Thesis has been formulated as:

Does diversification into the financial services industry significantly improve the financial performance of non-financial companies which diversify into the industry?

In this Section, the discussion held in the Literature Review and in this Chapter is brought together in the design of this research study whose objective is to answer the research question posed above.

As noted in Section 3.2, the author's orientation and training lead him to adopt a positivist stance in this Thesis and the research design chosen to answer the research question is the quasi-experimental method whereby the financial performance of a number of firms which have diversified into the financial services industry (the experimental or sample or non-financial companies) will be compared with the financial performance of a number of firms which have not diversified into the industry (the control or match companies). The choice of the quasi-experimental method is justified both on the basis of conceptual considerations and also on the grounds that a number of preceding academic studies have employed this research method. Thus, several authors (Ryan et al. (1992), Mitchell and Jolley (1996)), point out that the quasi-experimental method is a suitable research design to employ in circumstances where it is desired to utilise the experimental method but it is not possible for the researcher to manipulate the independent variable or variables directly and/or it is not possible to assign subjects at random to an experimental or control group. These circumstances apply to this study since the two conditions of the independent variable (whether or not a company has diversified into the financial services industry) have already occurred and it is thus not possible either to manipulate the independent variable or to assign subjects at random to

the experimental or control groups. A number of studies whose objective was to evaluate the financial performance of a group of firms have employed this research design, including some of the studies reviewed in this Thesis such as those by Weston and Mansinghka (1971) and Melicher and Rush (1973).

As discussed in Section 3.2, when the subjects in the experimental and control groups are not selected at random, it is important to maintain equivalence between the two groups and a recognised method of achieving this is to match the subjects in the experimental group and those in the control group. In practise, matching should be made on the basis of the most important extraneous variables, that is to say on the basis of the variables other than the independent variable or variables which have the greatest influence on the dependent variable or variables (Ryan et al. (1992)). In this study, the dependent variable is the financial performance of the companies in the experimental and control groups and, as discussed further below, the share returns achieved by these companies are held to be the main gauge of their financial performance. Following Fama and French (1992) who, as pointed out in Section 3.4, state (p.452) that "...the performance of managed portfolios...can be evaluated by comparing their average returns with the average returns of benchmark portfolios with similar size and BE/ME characteristics", the firms in the experimental and control groups will be matched on the basis of their size and market-to-book ratios. Fama and French (1992) conclude that size and market-to-book ratio proxy for underlying market risk factors and this study will thus control for the risk dimension in the share returns of the experimental and control groups by matching companies on the basis of these two factors. A similar approach was followed in a number of academic studies, including those by Loughran and Ritter (1995) and Spiess and Affleck-Graves (1999) and the approach is endorsed by Barber and Lyon (1997a) in their evaluation of alternative matching methods.

Furthermore, since the two groups of companies will be drawn from a number of different countries, each experimental firm will **ONLY** be matched with a control company originating from the same country, thus ensuring that each pair of companies was subjected to the same political, economic, social and business environment and that each pair was regulated by the same accounting principles and conventions.

The financial performance of a number of firms which have diversified into the financial services industry (the experimental or sample or non-financial companies) will thus be compared with the financial performance of a number of firms which have not diversified into the industry (the control or match companies) to determine whether the financial performance of the former firms is significantly superior to that of the latter firms. Firms' "financial performance" may be measured on the basis of data derived from two sources, namely share return data which are derived from the stock market and accounting ratio data which are obtained from companies' accounting statements. These two data sources were discussed in depth in Sections 3.4 and 3.5 respectively and it was concluded that, whilst share return data should generally provide a reasonably objective and accurate estimate of firms' financial performance, accounting ratio data are subject to several limitations and are a less reliable indicator of financial performance. Commenting on share price data, Damodaran (2001, p.26) states that "no competing measure comes close to providing as timely or as comprehensive a measure of a firm's standing." Whilst both market and accounting data will be used in this study, greater reliance will be placed upon, and more credibility will be given to, the market data in view of its relatively greater objectivity and accuracy.

The share return (or Investment Return (IR)) on the shares of each company in the experimental and control groups will be calculated over periods of years. The IR calculation for a particular company's shares for a one-year period will be made as per the following formula (Rees (1995), Damodaran (2001)):

$$IR = \frac{(P_t - P_{t-1}) + \text{dividends paid}}{P_{t-1}} * 100 \qquad (1)$$

where P_{t-1} = share price at the start of the period and P_t = share price at the end of the period.

Following Conrad and Kaul's (1993) and Barber and Lyon's (1997a) recommendation that, when statistical tests to detect long-run abnormal share returns are carried out, the single-period share returns should be compounded rather than cumulated since the latter method can give rise to upward or downward biases, the formula used to calculate each company's IR over a number of years will be as follows:

$$IR(k) = ((1+(IR_1/100))(1+(IR_2/100))\ldots(1+(IR_k/100)) - 1) * 100 \qquad (2)$$

where IR is the Investment Return for a one-year period and k represents the number of years over which IR is being compounded. IR(k) thus represents the Holding Period Return for a given number of years. Conrad and Kaul (1993, p.40) comment that "the appropriate measure of performance should be the buy and hold return over long intervals" and, following the above discussions, Holding Period Returns (which will also be referred to as compounded annual returns or IR's where the context is clear) are held to be the main measure of firms' financial performance in this Thesis.

Having obtained the compounded annual IR's, Wealth Relatives (WR) for the relevant time periods will be calculated on the lines suggested by Ritter (1991):

$$WR = \frac{1 + \text{Average IR(k) Experimental Group}}{1 + \text{Average IR(k) Control Group}} \qquad (3)$$

where IR(k) represents the compounded annual return over k years for each company in the experimental and control groups. A Wealth Relative greater than 1 may then be interpreted as the experimental group outperforming the control group and vice versa if the Wealth Relative is less than 1.

As pointed out in Section 3.5, "accounting" performance measures may be seen as a pyramid of ratios, at the apex of which lie Return on Assets, Return on Invested Capital (ROIC), and Return on Equity (ROE). These ratios are defined in this study as follows:

$$ROA = \frac{\text{Net Profit after Taxation + ((Interest on Debt Capital)*(1 – Tax Rate))}}{\text{Last Year's Total Assets}} *100 \qquad (4)$$

$$ROIC = \frac{\text{Net Profit after Taxation + ((Interest on Debt Capital)*(1 – Tax Rate))}}{\text{Last Year's Shareholders' Capital + Debt Capital}} *100 \qquad (5)$$

$$ROE = \frac{\text{Net Profit after Taxation - Preferred Dividends}}{\text{Last Year's Equity Capital}} *100 \qquad (6)$$

In the case of ROA and ROIC, Net Profit after Taxation is before deduction of dividends on preferred and equity capital. Further details on the ratios and their precise format on the Worldscope database, from where the data used in this study were sourced, is presented in Appendix A. The format used by Worldscope corresponds in substance to that shown above.

ROA, ROIC and ROE will be calculated for one-year periods for each company in the experimental and control groups and each company's average ROA, ROIC and ROE over varying periods of years will also be calculated.

3.7 Hypotheses Development and Specification

The research question being investigated in this Thesis has been formulated as:

Does diversification into the financial services industry significantly improve the financial performance of non-financial companies which diversify into the industry?

As discussed in Chapter 2, the most powerful reasons for undertaking a diversification strategy appear to be (a) the exploitation of synergy and economies of scope and (b) the reduction of transactions costs through the creation of internal capital and other markets since these factors can result in an improvement in a firm's profitability and can thereby lead to an increase in the market value of the firm's shares. Other reasons which have been put forward in favour of diversification include the reduction of risk and an increase in the firm's borrowing power although theoretical considerations indicate that neither of these factors would be expected to affect the market value of the firm's shares. A firm's diversification strategy may also be motivated by the desire of its managers to improve their career prospects and job security. The firm's resources, and particularly its distinctive competencies, were held to be of critical importance in the successful implementation of a diversification strategy.

It was argued in Chapter 2 that some of the benefits of diversification described above are more likely to arise from a strategy of related diversification whilst others are more likely to result from a conglomerate diversification strategy. Thus, a firm would be

more likely to achieve synergy and economies of scope if it diversifies into business activities which are closely related to its existing activities since this would facilitate the utilisation of the firm's existing resources in the production and distribution of the new products or services. On the other hand, a firm seeking to diversify in order to reduce its management's employment risks, increase its borrowing capacity or reduce its tax burden is likely to select a strategy of conglomerate diversification. In both related and conglomerate diversification strategies, firms would be expected to reap benefits from the reduction of transaction costs through the development of an internal market. Whichever form of diversification is selected by a firm, severe problems may arise in the integration of the firm's existing activities with its new activities and in the management of the enlarged organisation.

The empirical research which has been carried out on the links between diversification and financial performance does not conclusively demonstrate that diversification has generally had a positive effect upon firms' performance. It has however been argued (Markides (1993, 1995), Palich et al. (2000)) that the balance of the evidence on the issue indicates that firms' financial performance should improve as they diversify into related activities but then deteriorate as they diversify further into unrelated activities. (The literature suggests (Montgomery (1982), Palich et al. (2000)) that related and unrelated diversification are closely associated with a moderate and high level of diversification respectively). This is because firms which have diversified into related activities would be in a good position to reap synergy and economies of scope from their activities, apart from the benefits arising from a reduction in their transaction costs through the development of an internal market. However, as the firms diversify further into unrelated activities, it becomes more difficult to obtain synergies and economies of scope and also to manage the more complex organisation leading to diminishing returns from the increased level of diversification.

Following the definitions of related and conglomerate diversification made in Section 1.5, diversification into financial services may represent both a related and a conglomerate form of diversification, depending upon the relationship between a firm's existing assets or activities and the financial services it offers. A firm may offer financial services such as banking, providing credit facilities, broking, rental and leasing, insurance, and investment services only with respect to its existing business

activities and only utilising its existing assets, in which case it may be considered to be following a strategy of related diversification, or it may offer these services with respect to business activities unconnected with its current business activities and its existing assets, in which case it may be considered to be following a strategy of unrelated or conglomerate diversification.

Non-financial firms have been defined in this Thesis as firms which are involved in the provision of financial services but which derive the major part of their income from other business activities. By definition, therefore, these companies are engaged in a moderate amount of diversification into financial services activities. Following the above discussion, it is hypothesised that the non-financial firms would derive benefits through their diversification into the financial services industry primarily as a result of:

- the exploitation of synergy and economies of scope. As discussed in the Literature Review, several opportunities exist for non-financial firms to derive synergies and economies of scope in the financial services area by, for example, using their existing client base, brand name and distribution channels to market financial services products (Grant (1987), Leach (1994)). The literature indicates that these benefits are more likely to be obtained by companies which engage in related, rather than conglomerate, diversification. Since, by definition, non-financial companies are engaged in a moderate amount of diversification into financial services activities, and the literature suggests that a moderate amount of diversification is more likely to be associated with related than with conglomerate diversification, it is hypothesised that several of the non-financial firms would be engaged in financial services activities which are in some way related to their existing activities and/or assets (such as providing credit or rental facilities related to their current activities and/or assets) and should thus be in a good position to take advantage of synergies and economies of scope. However, the possibility that some of the non-financial firms may be concurrently, or solely, following a strategy of unrelated diversification is not excluded.

- the reduction of transactions costs through the creation of internal capital and other markets which has been identified by several authors as a major potential benefit of both related and conglomerate diversification (Williamson (1975), Grant (1995), Stein (1997)). Several opportunities exist for non-financial firms to

develop internal capital and other markets and thereby reduce their transactions costs by diversifying into financial services activities. Transactions costs may be reduced by, for example, the handling of a firm's insurance requirements by its own insurance operation. A firm's involvement in financial services activities and the development of its competencies in this area would enhance its opportunities and its ability to create and operate an internal capital market.

Since both the achievement of economies of scope and the reduction of transactions costs would be expected to improve a firm's profitability and thereby lead to an increase in the market value of the firm's shares, the following research hypothesis is formulated:

That diversification into the financial services industry significantly improves the financial performance of non-financial companies which diversify into the industry.

As discussed in the previous Section, in order to test the research hypothesis, the financial performance of a number of firms which have diversified into the financial services industry (the experimental or sample or non-financial companies) will be compared with the financial performance of a number of firms which have not diversified into the industry (the control or match companies). As described in further detail in Section 4.3 below, the experimental and control companies will be identified on the basis of their U.S. Standard Industrial Classification (SIC) codes. "Financial performance" will be operationalised as Investment Return (IR), Return on Assets (ROA), Return on Invested Capital (ROIC) and Return on Equity (ROE) in the manner described in Section 3.6.

The research hypothesis is thus operationalised as follows:

That there is a significant difference between the financial performance (IR, ROA, ROIC and ROE) of non-financial companies which have diversified into the financial services industry (the experimental or sample or non-financial companies) and the financial performance (IR, ROA, ROIC and ROE) of

companies which have not diversified into the industry (the control or match companies) in favour of the experimental companies.

The research hypothesis is translated into two statistical hypotheses - the null hypothesis and the alternative hypothesis - for each of the four measures of financial performance as shown below. The statistical hypotheses are formulated as two-tailed hypotheses since, although the financial performance of the experimental companies is expected to be superior to that of the control companies, the possibility that the opposite is the case cannot be ruled out on the basis of the evidence available to date.

In Section 3.3, two statistical procedures suitable for testing the null hypothesis in the case of paired samples were outlined, namely the parametric paired sample t-test and the non-parametric Wilcoxon signed ranks test. Each of the four null hypotheses will be tested using both of these statistical tests for robustness. The four null hypotheses are formulated as follows:

H_0 1: The IR of the experimental companies is not significantly different to the IR of the control companies

which may be formulated as **H_0 1:** $\mu_{\text{IR EXPERIMENTAL COMPANIES}} = \mu_{\text{IR CONTROL COMPANIES}}$

or $\mu_{\text{IR EXPERIMENTAL COMPANIES}} - \mu_{\text{IR CONTROL COMPANIES}} = 0$

(The population mean is substituted by the population median in the case of the Wilcoxon signed ranks test).

H_0 1 will be tested over varying periods of years. The annual IR of each of the experimental and control group companies will be obtained as per formula (1) above and each company's annual IR will be compounded over varying periods of years as per formula (2).

H_0 2: The ROA of the experimental companies is not significantly different to the ROA of the control companies

which may be formulated as **H_0 2:** $\mu_{\text{ROA EXPERIMENTAL COMPANIES}} = \mu_{\text{ROA CONTROL COMPANIES}}$

H_0 3: The ROIC of the experimental companies is not significantly different to the ROIC of the control companies

which may be formulated as **H_0 3:** $\mu_{\text{ROIC EXPERIMENTAL COMPANIES}} = \mu_{\text{ROIC CONTROL COMPANIES}}$

H_0 4: The ROE of the experimental companies is not significantly different to the ROE of the control companies

which may be formulated as **H_0 4:** $\mu_{\text{ROE EXPERIMENTAL COMPANIES}} = \mu_{\text{ROE CONTROL COMPANIES}}$

H_0 2, **H_0 3** and **H_0 4** will be tested over varying periods of years. The annual ROA, ROIC and ROE of each of the experimental and control group companies will be obtained as per formulae (4), (5) and (6) above and each company's annual ROA, ROIC and ROE will be averaged over varying periods of years.

Rejection of the null hypothesis **H_0** at certain probability levels (10%, 5% and 1%) will result in the acceptance of the alternative hypothesis **H_a** at those probability levels. The alternative hypotheses may be formulated as:

H_a 1: $\mu_{\text{IR EXPERIMENTAL COMPANIES}} \neq \mu_{\text{IR CONTROL COMPANIES}}$

or $\mu_{\text{IR EXPERIMENTAL COMPANIES}} - \mu_{\text{IR CONTROL COMPANIES}} \neq 0$

H_a 2: $\mu_{\text{ROA EXPERIMENTAL COMPANIES}} \neq \mu_{\text{ROA CONTROL COMPANIES}}$

H_a 3: $\mu_{\text{ROIC EXPERIMENTAL COMPANIES}} \neq \mu_{\text{ROIC CONTROL COMPANIES}}$

H_a 4: $\mu_{\text{ROE EXPERIMENTAL COMPANIES}} \neq \mu_{\text{ROE CONTROL COMPANIES}}$

3.8 Summary

The research methodology used in this study to investigate the research question was outlined in this Chapter. Research methodology was discussed in general terms in

Section 3.2 and this was followed in Section 3.3 by a description of relevant quantitative methods and techniques. Finance and accounting issues related to the subject-matter of the Thesis were examined in Sections 3.4 and 3.5 respectively following which the design of the research study was outlined in Section 3.6. Finally, the research hypotheses were developed and formulated in Section 3.7.

CHAPTER 4: DATA

4.1 Introduction

The process undertaken to collect and organise the data required to test the hypotheses formulated in Section 3.7 is described in detail in this Chapter. The structure of the Worldscope database, which was used as the main source of data for this study, is outlined first in Section 4.2 and this is followed by a discussion on the procedures used to identify the sample and match companies in Sections 4.3 and 4.4 respectively. Some observations on the sample selection process are made in Section 4.5 whilst Section 4.6 describes the financial data collected for each of the sample and match companies. The Pilot Study carried out to test the sample selection process is outlined in Section 4.7 and finally a summary of the Chapter is provided in Section 4.8.

4.2 Worldscope Database

The Worldscope database is utilised by institutions and companies worldwide. It was launched in the U.K. in 1995 by the Bureau van Dijk who provided the database service to several established institutions in the U.K. including Fidelity Investment Services, the Inland Revenue and Henley Management College until November 2001. Bureau van Dijk substituted the Worldscope database by the Osiris database in December 2001, the former database constituting the main source of information for the latter. This study commenced in 1998 and used the Worldscope database, which was at the time available at the Henley Management College library and accessible through the internet, as the main source of data. The Worldscope database was also used as a source of information for two of the articles cited in this Thesis, namely those by La Porta et al. (1997) and Lins and Servaes (1999), both of which were published in the Journal of Finance.

The November 2000 edition of the Worldscope database contained financial and management information on 22,719 companies quoted on stock exchanges in different countries. Of these, 1900 were quoted on OTC (Over the Counter) stock exchanges (excluding NASDAQ). The financial information provided in the database for each

company consists of its main periodic financial statements - its Profit and Loss Accounts, Balance Sheets and Cash Flow Statements - together with market information such as market capitalisation data and share price data. Recognising the diversity in the accounting practices used in different countries by different companies, as discussed in Section 3.5, Worldscope's Data Definitions Guide (1994) states that its analysts attempt to minimise the accounting differences by first examining the accounting items contained in each company's financial statements and standardising them as far as possible according to Worldscope's definitions of accounting terms. The accounting items are then transferred to standardised templates containing Profit and Loss Account, Balance Sheet and other financial statements structured on the basis of Worldscope's definitions of accounting terms. There are four such templates - one for Banks, one for Insurance companies, one for Other Financial companies and one for the remaining companies which are termed Industrials. The accounting practices followed by Worldscope are comprehensively detailed in the Data Definitions Guide (1994).

Certain other features of the database which are relevant to this study include:

- Fiscal Year-Ends: in the Worldscope database, a fiscal year runs from 1st April of a particular year to 31st March of the following year. Thus, if a company's fiscal year-end falls between 1st April 1998 and 31st March 1999, its financial results would be deemed to be those of 1998.

- Time Periods: the maximum number of years for which data for companies is available is ten years.

- Ratios: a comprehensive number of financial ratios are available on the Worldscope database and details of the method of calculation of each ratio are given in the Data Definitions Guide (1994). The ratios include Return on Assets, Return on Invested Capital and Return on Equity and the method of calculation of these ratios is shown in Appendix A. Since the ratios are derived from standardised accounting data and relate to standardised accounting years as noted above, it is possible to compare them between countries, companies, and time-periods provided that, as discussed in Section 3.5, caution is exercised to ensure that such comparisons are not invalidated by factors such as differences in the political, economic, social and business conditions of

the different countries in which the companies operate and / or by differences in the accounting principles and practices which may be adopted by different companies.

- SIC Codes: each company on the database is coded according to the type of activity or activities in which it is engaged. The codes include the U.S. and U.K. Standard Industrial Classification (SIC) codes and, when these codes are not available, e.g. the U.S. SIC codes for non-U.S. companies, these are provided by Worldscope analysts based on the companies' SIC code classifications in their own country or on other information available about the companies. The database provides both a Primary SIC code which identifies the main activity in which the company is involved and one or more Additional SIC codes which identify the other activities in which the company is involved.

The US SIC codes are composed of four digits. The first two digits run from 01 to 99 and indicate the general nature of a business activity whilst the next two digits classify a business activity in further detail. A typical example is Volkswagen AG's Primary SIC code which is 3711 and stands for:

- first two digits: 37 - Transportation Equipment Manufacturing.

- first three digits: 371 - Motor Vehicles and Motor Vehicle Equipment Manufacturing.

- four digits: 3711: - Motor Vehicles and Passenger Car Bodies Manufacturing.

- Segmental Data: when available, data on sales value, operating income and assets on a product-segment and geographic-segment basis are provided on the database. However, this information is only available for the latest set of financial statements and is not consolidated on the database.

- Geographic Information: the geographic location of each company is indicated on the database. In the case of companies which operate in more than one geographical area, the geographic location is taken to be the country in which the

companies' ultimate holding company is registered. In this study, references to companies' geographic area or location follow those indicated by Worldscope since, as noted above, segmental geographic information is not available for all firms and is not consolidated on the database.

- Exchange Rates: month-end exchange rates are held on the database for all the countries represented on it. A company's financial data are initially placed on the database in the currency reported by the company and the data are translated into other currencies by database programs at the exchange rate ruling at the company's fiscal year-end. However, it is also possible for the user to specify the exchange rate which he or she would like to apply to a particular data set.

It should be noted that, whilst it is necessary to translate the data relating to financial items such as sales or net profits of companies in different countries to a common currency such as dollars or sterling to allow comparisons between the companies' data, this is not the case with respect to share return or accounting ratio data since these items, although calculated on the basis of the original currency in which the companies' results are reported, are expressed in percentage term.

- Search Facilities: the database allows searches to be made on the basis of several criteria, including industry type, geographic area etc.

The fact that the Worldscope database has been used for several years by a number of established institutions and that it has been the source of data for two papers published in the Journal of Finance indicate that the financial information contained on it is of high quality and is accurately reported. The Data Definitions Guide (1994) states that the data are subject to over 600 quality control checks, both computerised and human, before being placed on the database. Notwithstanding this, the data contained in the published accounts of certain companies, including Marks & Spencer plc and Amey plc, were checked and found to be consistent with those on the Worldscope database, except that the data had been reorganised in accordance with the Worldscope database templates as described above.

4.3 Sample Identification

4.3.1 SIC Sample

In line with the objectives of this study as defined in Chapter 1, the first step in the data collection exercise was to identify the firms on the Worldscope database which have been defined as non-financial companies for the purposes of this Thesis, namely companies which are involved in the provision of financial services but which derive the major part of their income from other business activities. This was done by examining the US SIC code of each company on the database and identifying those firms whose Primary SIC code was not related to financial services but which had one or more Additional SIC codes which were related to financial services. Following the discussion on the nature of financial intermediation in Section 2.2.2, which was defined as the facilitating of the flow of funds between those who wish to lend and those who wish to borrow, the US SIC codes indicating the provision of a financial service were identified as those listed in Appendix B which comprise the following main activities:

- banking
- providing credit facilities
- broking
- insurance
- rental and leasing
- investment services

A search was conducted on the Worldscope database to identify the firms whose Primary SIC code was not related to financial services but which had one or more Additional SIC codes related to the financial services activities noted above and data relating to these companies, including details of their Primary and Additional SIC codes and their segmental data were downloaded from the database. The total sample of these

companies is hereafter referred to as the "SIC sample" whilst the individual companies in the sample are termed the "SIC sample companies" or the "non-financial companies" or "the companies which diversified into financial services" or the "sample companies" where the context is clear. A typical SIC sample company is Volkswagen AG whose US SIC codes read as follows, with the last two Additional SIC codes (7515 and 6159) indicating a financial services activity:

- Primary SIC code: 3711, Motor Vehicles and Passenger Car Bodies Manufacturing.

- Additional SIC codes: 3714, Motor Vehicle Parts and Accessories Manufacturing; 5012, Automobiles and Other Motor Vehicles Wholesale Dealing in; 7515, Passenger Car Leasing; 6159, Miscellaneous Business Credit Institutions.

An examination of the data downloaded from the Worldscope database revealed two instances where the above procedure did not capture the nature of the main activity of the SIC sample companies sufficiently well, namely:

(i) in the case of companies whose Primary SIC code was of a generic nature such as "Offices of Holding Companies, not Elsewhere Classified". In these cases, the Additional SIC codes were examined and the first Additional SIC code was taken to represent the nature of that company's activities.

(ii) in the case of companies whose Primary SIC code fell in the 65 category which is defined as "Real Estate" and includes activities such as "Operators of Apartment Buildings". In these cases, it could not be determined from examination of the Primary SIC code whether the firms' main activity consisted of renting or leasing properties (which were defined as financial services activities) or of operating or trading in properties (which were not defined as financial services activities) and reference was thus made to these firms' segmental sales information to determine whether to classify them as SIC sample companies or not.

After adjusting the SIC sample for (i) and (ii) above, the SIC sample companies consisted of 916 firms and, as described in detail in Section 4.4.1, an attempt was made

to find a suitable match company for each of the SIC sample companies on the basis of SIC code, market capitalisation and market-to-book ratio. For the reasons noted in Section 4.4.1, the matching process resulted in the elimination of 200 SIC sample companies so that the final SIC sample consisted of 716 companies whose characteristics are illustrated in the following Tables.

Tables 4.1 and 4.2 provide a summary of the SIC sample companies' first financial Additional SIC codes and Primary SIC codes respectively, together with their geographic location and this information is broken down in further detail in the Tables in Appendices C and D. As can be seen from the Tables, the companies are spread over 37 countries with 68.1% of them being located in the U.S., U.K., Japan, Hong Kong and Malaysia. The companies' Primary SIC codes are diverse and are widely spread over different business activity areas with the largest proportion (29.6%) being involved in manufacturing activities whilst the next largest proportion (21.5%) are involved in wholesale and retail activities. The companies' financial services activities are also diverse with the largest proportions being involved in rental and leasing (36.4%) and banking and credit (24.2%) activities.

TABLE 4.1: SIC SAMPLE BY GEOGRAPHIC AREA AND FINANCIAL SIC CODE

GEOGRAPHIC AREA	BANKING & CREDIT	BROKING	INSURANCE	RENTAL & LEASING	INVESTMENT SERVICES	TOTAL	%
NORTH AMERICA	68	20	19	49	6	162	22.6%
EUROPE	30	17	19	101	13	180	25.2%
JAPAN	33	2	42	68	1	146	20.4%
OTHER ASIA	31	41	8	35	72	187	26.1%
AUSTRALASIA	5	2	2	4	13	26	3.6%
SOUTH AFRICA	3	1		3	3	10	1.4%
SOUTH AMERICA	3		1	1		5	0.7%
TOTAL	173	83	91	261	108	716	100%
%	24.2%	11.6%	12.7%	36.4%	15.1%	100%	

TABLE 4.2: SIC SAMPLE BY GEOGRAPHIC AREA AND PRIMARY SIC CODE

GEOGRAPHIC AREA	AGRICULTURE MINING ETC.	MANUFAC-TURING	TRANSPORT & COMMUN-ICATIONS	WHOLESALE & RETAIL	SERVICES	TOTAL	%
NORTH AMERICA	27	56	28	23	28	162	22.6%
EUROPE	17	56	25	49	33	180	25.2%
JAPAN	14	35	33	43	21	146	20.4%
OTHER ASIA	27	54	20	28	58	187	26.1%
AUSTRALASIA	6	7	2	7	4	26	3.6%
SOUTH AFRICA		3	3	2	2	10	1.4%
SOUTH AMERICA	1	1		2	1	5	0.7%
TOTAL	92	212	111	154	147	716	100%
%	12.9%	29.6%	15.5%	21.5%	20.5	100%	

Table 4.3 provides descriptive statistics on the SIC sample companies' 1998 market capitalisation data.

TABLE 4.3: SIC SAMPLE 1998 MARKET CAPITALISATION BY GEOGRAPHIC AREA (POUNDS STERLING MILLION)

GEOGRAPHIC AREA	N	MEAN	STANDARD DEVIATION	MEDIAN	MAXIMUM VALUE	MINIMUM VALUE
NORTH AMERICA	162	2,538.1	7,999.1	238.2	78,163.2	1.9
EUROPE	180	1,528.0	5,209.7	161.8	59,206.4	2.2
JAPAN	146	1,605.4	6,467.4	93.6	66,411.6	4.9
OTHER ASIA	187	196.6	606.9	43.2	6,163.2	0.8
AUSTRALASIA	26	634.3	896.1	259.5	3,060.3	4.8
SOUTH AFRICA	10	208.2	321.0	95.9	1,062.6	12.3
SOUTH AMERICA	5	113.3	147.4	33.6	362.1	13.5
TOTAL	716	1,363.8	5,526.9	102.2	78,163.2	0.8

Similar descriptive statistics on the 1998 market-to-book ratios of the SIC sample companies are provided in Table 4.4.

TABLE 4.4: SIC SAMPLE 1998 MARKET-TO-BOOK RATIOS BY GEOGRAPHIC AREA

GEOGRAPHIC AREA	N	MEAN	STANDARD DEVIATION	MEDIAN	MAXIMUM VALUE	MINIMUM VALUE
NORTH AMERICA	162	1.9777	9.3418	1.7976	21.61	-109.65
EUROPE	180	3.2071	6.3097	1.9299	68.11	-14.39
JAPAN	146	1.6364	2.0932	1.034	10.17	-6.92
OTHER ASIA	187	1.2051	2.6017	0.5742	25.28	-1.39
AUSTRALASIA	26	1.7403	1.5742	1.2169	8.05	0.3
SOUTH AFRICA	10	2.3347	1.5749	2.1834	5.4	0.45
SOUTH AMERICA	5	0.677	0.5699	0.4703	1.63	0.13
TOTAL	716	2.0032	5.7412	1.2381	68.11	-109.65

The data presented in Table 4.3 indicate a wide spread in the market capitalisation of the SIC sample companies, ranging from a maximum value of pounds sterling 78,163.2 million in the case of Philip Morris Companies Inc (a U.S. company) to pounds sterling 786,373 in the case of Distar Electric Corporation (a Thai company), with the global mean value being pounds sterling 1,363.8 million. Large variations also exist between the regional groupings, with the North American firms having a mean market capitalisation of pounds sterling 2,538.1 million compared to pounds sterling 113.3 million in the case of the South American companies. The market-to-book ratios in Table 4.4 also exhibit wide variations, with the European and South American firms having the highest and lowest mean values, namely 3.2071 and 0.677 respectively; the global market-to-book ratio mean value stands at 2.0032.

4.3.2 SEG Sample

As discussed in Section 4.3.1, the match companies for the SIC sample companies were identified on the basis of their SIC code, market capitalisation and market-to-book ratio. For robustness, it was decided to form a second sample, hereafter termed the SEG sample, in which each SIC sample company's activities would be broken down into a financial and a non-financial segment on the basis of its segmental data and a match company identified for each segment. The two match companies would then be combined into a pseudo match company and the latter's financial performance compared with that of the SIC sample company.

Examination of the segmental data relating to the sales value, operating income and assets of the 916 SIC sample companies initially identified on the database revealed that data on segmental sales value was available for all the companies for which segmental data was provided whilst segmental data on operating income and assets was missing in the case of several companies. For the purposes of forming the SEG sample it was thus decided to base the identification of the sample companies' activities upon their sales value data and examination of this data showed that, in the case of 466 firms, or 50.9 % of the SIC sample companies, one or more of the sales segments related to financial services. These companies are hereafter termed the "SEG sample companies" or the "non-financial companies" or "the companies which diversified into financial services" or the "sample companies" where the context is clear. In the case of the remaining firms in the SIC sample, either no segmental data was reported or segmental data was reported but a financial services activity was not clearly indicated in the description of the sales value segments. (The fact that a financial services activity was not reported in a company's segmental sales data does not necessarily mean that the company did not in fact carry out any financial services activities since the segmental sales descriptions on the database are often generic such as "commercial customers" or "general retail operations". The SIC codes used in the SIC sample, which are based on the companies' official categorisation and / or on Worldscope analysts' examination of its activities, are thus a more reliable indicator as to whether or not a company was involved in providing financial services).

Having identified the SEG sample companies, the segmental sales figures of each of these companies were totalled and the proportion of sales relating to non-financial services activities (the non-financial segment) and the proportion relating to financial services activities (the financial segment) in each company determined. In the case of 31 companies (or 6.7 % of the sample), total sales relating to the financial segment amounted to more than 50% of total sales and these companies were eliminated from the SEG sample. A summary of the proportion of sales relating to the non-financial and financial segments of the remaining 435 companies is shown in Table 4.5 which indicates that the mean proportion of sales relating to the two segments stood at 88.9 % and 11.1 % respectively. (The sales data relates to 1998 in the case of 322 companies and to earlier or later time periods in the case of 113 companies).

TABLE 4.5: SEG SAMPLE SEGMENTAL SALES PROPORTIONS

SEGMENT	N	MEAN PROPORTION	STANDARD DEVIATION	MEDIAN	MAXIMUM VALUE	MINIMUM VALUE
NON-FINANCIAL SEGMENT	435	88.9%	11.8%	93.4%	99.96%	50.91%
FINANCIAL SEGMENT	435	11.1%	11.8%	6.6%	49.09%	0.04%

The data in Table 4.5 for the SEG sample justifies the process used to identify both the SIC sample companies and the SEG sample companies. The focus of this study is upon companies which are involved in the provision of financial services but which derive the major part of their income from other business activities and Table 4.5 confirms that the companies chosen for the SEG sample fall within this category. The companies identified for the SIC sample consist of those chosen for the SEG sample together with other companies for which either (a) no segmental data were reported on the database or (b) a financial services activity was not clearly indicated in the description of the sales segments. In both cases it is reasonable to assume that the SIC sample companies would also follow the pattern noted in the SEG sample. In the case of (a), the fact that no segmental sales information was reported should not have any bearing upon the composition of their sales. In the case of (b), as noted above, the segmental sales descriptions on the database are often generic and do not necessarily mean that the company did not in fact carry out any financial services activities. It is however possible that a small proportion of the SIC sample companies did not in fact carry out any financial services activities or that the sales value of the financial services activities of some of these companies amounted to more than 50% of total turnover but since it was not possible to identify these companies in the SIC sample (except for the few companies identified in the SEG sample), and since the SEG sample indicated that only a small percentage of companies fell into this category, they were not eliminated from the SIC sample.

The process followed to identify suitable match companies for the SEG sample companies is described in detail in Section 4.4.2. As was the case in the SIC sample, the matching process resulted in the elimination of a number of the 435 SEG sample companies such that the final SEG sample consisted of 148 companies whose characteristics are described in the following Tables. Tables 4.6 and 4.7 provide a

summary of the SEG sample companies' first financial Additional SIC codes and Primary SIC codes respectively, together with their geographic location and this information is broken down in further detail in the Tables in Appendices E and F. As can be seen from the Tables, the companies are spread over 20 countries with 78.4% of them being located in the U.S., U.K., Germany, Japan and Hong Kong. As in the case of the SIC sample, the companies' Primary SIC codes are diverse and are widely spread over different business activity areas with the largest proportions again being involved in manufacturing activities and in wholesale and retail activities (36.5% and 21.6% respectively). The companies' financial services activities are also diverse with the largest proportions again being involved in credit and banking (35.7%) and rental and leasing (33.8%) activities.

TABLE 4.6: SEG SAMPLE BY GEOGRAPHIC AREA AND FINANCIAL SIC CODE

GEOGRAPHIC AREA	BANKING & CREDIT	BROKING	INSURANCE	RENTAL & LEASING	INVESTMENT SERVICES	TOTAL	%
NORTH AMERICA	25	4	5	9	1	44	29.7%
EUROPE	10	3	7	26	3	49	33.1%
JAPAN	10		1	11		22	14.9%
OTHER ASIA	6	7		4	14	31	20.9%
AUSTRALASIA	1					1	0.7%
SOUTH AFRICA	1					1	0.7%
TOTAL	53	14	13	50	18	148	100%
%	35.7%	9.5%	8.8%	33.8%	12.2%	100%	

TABLE 4.7: SEG SAMPLE BY GEOGRAPHIC AREA AND PRIMARY SIC CODE

GEOGRAPHIC AREA	AGRICULTURE MINING ETC.	MANUFAC-TURING	TRANSPORT & COMMUN-ICATIONS	WHOLESALE & RETAIL	SERVICES	TOTAL	%
NORTH AMERICA	10	16	5	8	5	44	29.7%
EUROPE	1	23	6	14	5	49	33.1%
JAPAN	6	6	1	4	5	22	14.9%
OTHER ASIA	4	8	2	6	11	31	20.9%
AUSTRALASIA		1				1	0.7%
SOUTH AFRICA			1			1	0.7%
TOTAL	21	54	15	32	26	148	100%
%	14.2%	36.5%	10.1%	21.6%	17.6%	100%	

Table 4.8 provides descriptive statistics on the SEG sample companies' 1998 non-financial segment sales data.

TABLE 4.8: SEG SAMPLE 1998 NON-FINANCIAL SEGMENT SALES BY GEOGRAPHIC AREA (POUNDS STERLING MILLION)

GEOGRAPHIC AREA	N	MEAN	STANDARD DEVIATION	MEDIAN	MAXIMUM VALUE	MINIMUM VALUE
NORTH AMERICA	44	5,400.7	17,129.1	466.5	87,868.9	4.8
EUROPE	49	4,146.3	9,209.8	488.9	39,650.0	1.3
JAPAN	22	6,898.3	15,541.7	521.3	62,698.7	80.1
OTHERS	33	143.5	187.7	74.6	881.7	3.5
TOTAL	148	4,035.8	12,378.4	322.5	87,868.9	1.3

Similar descriptive statistics on the 1998 financial segment sales of the SEG sample companies are provided in Table 4.9.

TABLE 4.9: SEG SAMPLE 1998 FINANCIAL SEGMENT SALES BY GEOGRAPHIC AREA (POUNDS STERLING MILLION)

GEOGRAPHIC AREA	N	MEAN	STANDARD DEVIATION	MEDIAN	MAXIMUM VALUE	MINIMUM VALUE
NORTH AMERICA	44	665.5	2,668.5	20.4	15,850.9	0.2
EUROPE	49	341.2	827.8	29.7	3,778.9	0.08
JAPAN	22	319.8	708.5	55.2	2,955.3	4.9
OTHERS	33	25.9	74.6	8.6	433.8	0.1
TOTAL	148	364.4	1,559.9	23.6	15,850.9	0.08

The data presented in Table 4.8 indicate a wide spread in the sales values of the non-financial segments of the SEG sample companies, ranging from a maximum value of pounds sterling 87,868.9 million in the case of General Motors Corporation (a U.S. company) to pounds sterling 1.3 million in the case of Tegernsee-Bahn AG (a German company), with the global mean value being pounds sterling 4,035.8 million. Large variations also exist between the regional groupings, with the Japanese firms having a mean sales value of pounds sterling 6,898.3 million compared to pounds sterling 143.5 million in the case of the Other countries. The sales values of the financial segments in Table 4.9 also show a wide variation, ranging from a maximum value of pounds sterling 15,850.9 million in the case of Ford Motor Company (a U.S. company) to pounds sterling 76,170 in the case of Teutoburger Wald Eisenbahn AG (a German company), with the global mean value being pounds sterling 364.4 million. Large variations also exist between regions, with the U.S. firms having a mean sales value of pounds sterling

665.5 million compared to pounds sterling 25.9 million in the case of the Other countries.

Table 4.10 presents a breakdown of the mean non-financial and financial segmental sales proportions in the different geographic areas. Other countries show the highest mean financial segment proportion at 15.3% of total sales whilst the lowest mean financial segment proportion is that of the Japanese firms at 4.4%. The global mean financial segment proportion of 8.3% contrasts with that of 11.1% in Table 4.5 which was based on a larger sample size of 435 firms.

TABLE 4.10: SEG SAMPLE 1998 SEGMENTAL SALES PROPORTIONS BY GEOGRAPHIC AREA (POUNDS STERLING MILLION)

GEOGRAPHIC AREA	N	MEAN TOTAL SALES	MEAN NON-FINANCIAL SEGMENT	MEAN PROPORTION	MEAN FINANCIAL SEGMENT	MEAN PROPORTION
NORTH AMERICA	44	6,066.2	5,400.7	89.0%	665.5	11.0%
EUROPE	49	4,487.5	4,146.3	92.4%	341.2	7.6%
JAPAN	22	7,218.1	6,898.3	95.6%	319.8	4.4%
OTHERS	33	169.4	143.5	84.7%	25.9	15.3%
TOTAL	148	4,400.2	4,035.8	91.7%	364.4	8.3%

4.4 Matching Process

4.4.1 SIC Sample

Having identified the initial samples of 916 SIC sample companies and 435 SEG sample companies in the manner outlined in Section 4.3, the next step undertaken was to identify match companies for each of the SIC sample companies and the SEG sample companies and this process is described in detail in this Section. At the end of this process, the final samples of 716 SIC sample companies and 148 SEG sample companies whose characteristics have been described in Section 4.3 were identified.

Following the discussion in Section 3.6, in the case of the SIC sample, companies were matched on the basis of their US SIC codes and their market capitalisation and market-to-book ratios following the rules set out below. The companies with which the SIC sample companies were matched are hereafter referred to as the "SIC match companies"

or the "the companies which did not diversify into financial services" or the "match companies" where the context is clear. The rules followed to identify the match companies were:

(i) the geographic location of each pair of sample and match companies should be in the same country.

(ii) the Primary and Additional SIC codes of the match companies should not include any of the SIC codes indicating a financial services activity as defined in Section 4.3.1.

(iii) a match company should be paired only once with a sample company.

(iv) the companies should be paired on the basis of their US SIC codes and their 1998 market capitalisation and market-to-book ratios as follows:

- firstly, sample companies should be matched at the four-digit level with companies whose market capitalisation and market-to-book ratio did not differ by more than 25% in total from those of the sample companies.

- if no suitable match company was found, an attempt would be made to match at the three-digit and two-digit levels whilst maintaining the maximum difference between the market capitalisation and market-to-book ratios of the sample and match companies at 25% in total. If an appropriate match company was still not found, the sample company would be paired with any suitable company falling within the 25% difference range.

- if a suitable match company was not found at this stage, the above process would be repeated at the 25% + to 50% difference level between the market capitalisation and market-to-book ratios in total and subsequently at the 50% + to 75% and at the 75% + to 100% difference levels.

(v) as a minimum, 1998 Investment Return data should be available for each sample company. Going backward from 1998, the match companies should have at least as many years of uninterrupted Investment Return data on the database as the sample companies. If the match companies had more years of Investment Return data than the sample companies, the additional years' data would be discarded.

Having established the above rules for pairing the sample and match companies, the data relating to the market capitalisation and market-to-book ratios of all the companies on the database on their 1998 fiscal year-end were downloaded. (As discussed further in Section 4.5 below, this year was chosen since segmental sales value data for most of the SEG sample companies was only available for 1998. By carrying out the matching process for both samples on the basis of 1998 data, it was ensured that the two samples were comparable in terms of the time period in which the companies in the respective samples were matched). The market capitalisation data were downloaded in pounds sterling to ensure that comparisons could be made between the market capitalisation figures of companies in different countries. Investment Return data for all the companies on the database for the 1989 - 1998 period were also downloaded.

Using the Access and Visual Basic software, a computer program was then written for the author by his firm's data processing department to identify the match companies by processing the SIC code, market capitalisation, market-to-book ratio and Investment Return data of the 916 SIC sample companies according to the rules described above. (As noted above, the sample and match companies' 1998 market capitalisation data were downloaded in pounds sterling to ensure that comparisons could be made between the market capitalisation figures of companies in different countries. The matching process was thus carried out in pounds sterling which introduced an exchange rate effect into the process in cases where the sample and match companies had different fiscal year-ends and their market capitalisation figures were converted at different exchange rates. However, the exchange rate effect should be marginal given that (a) the sample and match companies originated from the same country and were matched in the same year and (b) most companies' fiscal year-ends are clustered around certain months of the calendar year. Thus, for example, the fiscal year-ends of 70% of the U.S. companies on the database occur between November and January whilst 86% of the Japanese companies' fiscal year-ends occur between January and March during which periods in

1998/1999 the pound sterling/dollar and pound sterling/yen exchange rate movements amounted to only -0.5% and 1% respectively).

The data processing exercise outlined above resulted in the identification of 716 matched pairs of companies. A suitable match company was not identified for 52 of the sample companies whilst in 148 cases insufficient 1998 data on the sample company was available. (The decrease in sample size, which also occurs in the case of the SEG sample, is not surprising in view of Ryan et al.'s (1992) comment noted in Section 3.2 that a substantial decrease in sample size can occur as subjects are matched). Having identified the 716 pairs of sample and match companies, paired sample t-tests were carried out to ensure that the differences between their mean market capitalisation and market-to-book ratio data were not statistically significant. The initial results are presented in Table 4.11 and showed a t-value of 2.089 in the case of market capitalisation and a t-value of 3.089 in the case of market-to-book ratio which indicate a statistically significant difference between the mean values of the sample and match companies in the case of both parameters.

TABLE 4.11: SIC SAMPLE INITIAL MATCHING RESULTS

SAMPLE	N	SAMPLE MEAN	MATCH MEAN	DIFFERENCE	t-value	t-prob. (2-tailed)
1998 MARKET CAPITALISATION	716	1,363.8^	1,165.2^	198.6	2.089	0.037**
1998 MARKET-TO-BOOK RATIO	716	2.0032	1.7819	0.2213	3.089	0.002***

^ Pounds sterling million

** Significant at the 5% level

*** Significant at the 1% level

To correct this position, the pairs of companies showing the largest difference in their market capitalisation and market-to-book ratio data were identified. Starting with the pair which showed the greatest difference in its market capitalisation data, a substitute match company was sought which, on replacing the current match company, would reduce the existing difference in the pair's market capitalisation data as far as possible whilst maintaining the total market capitalisation and market-to-book ratio difference at below the 100% level. A t-test was then carried out on the revised data and the process

repeated until the statistically significant difference between the mean market capitalisation of the sample and match companies was eliminated. A similar process was then carried out with respect to the market-to-book ratio data except that it was found necessary to relax the rule regarding the maximum total difference between each pair's market capitalisation and market-to-book ratio from 100% to 200% in view of the fact that an insufficient number of suitable match companies were still available at this stage. In total, 2 substitute match companies were required to eliminate the statistically significant difference in the market capitalisation data and 9 to eliminate that in the market-to-book ratio data. The final results are shown in Table 4.12 and indicate that the differences between the means of the sample and match companies are not statistically significant in the case of both parameters. The Pearson correlation coefficients stands at 0.967 in the case of the market capitalisation data and at 0.959 in the case of the market-to-book ratio data (where 1.0 denotes a perfect linear relationship) which denote a close relationship between the data sets. In both cases, the correlation is significant at the 1% level.

TABLE 4.12: SIC SAMPLE FINAL MATCHING RESULTS

SAMPLE	N	SAMPLE MEAN	MATCH MEAN	DIFFERENCE	t-value	t-prob. (2-tailed)
1998 MARKET CAPITALISATION	716	1,363.8^	1,287.7^	76.1^	1.419	.156
1998 MARKET-TO BOOK RATIO	716	2.0032	1.9237	0.0795	1.239	.216

^ Pounds sterling million

The final results of the matching process for the SIC sample are also tabulated in Tables 4.13 and 4.14. Table 4.13 shows the number and proportion of companies which were matched at the four-digit, three-digit, two-digit and one-digit levels.

TABLE 4.13: SIC SAMPLE MATCHING RESULTS BY SIC CODE

SIC CODE LEVEL	NUMBER OF COMPANIES	PROPORTION OF COMPANIES
4 DIGIT	32	4.5%
3 DIGIT	21	2.9%
2 DIGIT	61	8.5%
1 DIGIT	602	84.1%
TOTAL	716	100.0%

Table 4.14 presents the number and proportion of companies which were matched at the 25%, 50%, 75%, 100% and 200% difference levels in total between the market capitalisation and market-to-book ratios of the sample and match companies.

TABLE 4.14: SIC SAMPLE MATCHING RESULTS BY MARKET CAPITALISATION / MARKET-TO-BOOK RATIO % DIFFERENCE

% DIFFERENCE	NUMBER OF COMPANIES	PROPORTION OF COMPANIES
UP TO 25%	489	68.3%
25%+ TO 50%	144	20.1%
50%+ TO 75%	46	6.4%
75%+ TO 100%	28	3.9%
100%+ TO 200%	9	1.3%
TOTAL	716	100.0%

As can be seen from Table 4.14, the paired companies were closely matched in terms of their market capitalisation and market-to-book ratio data, with the percentage difference between the sample and match companies being less than 25% in the case of 68.3% of the companies. On the other hand, Table 4.13 shows that the companies were less closely matched on the basis of their SIC codes, considering that only 15.9% of the pairs were matched at up to the 2-digit level. However, on the strength of the Fama and French (1992) study discussed in Section 3.4, greater weighting is given in this study to matching on the basis of market capitalisation and market-to-book ratio data than on the basis of SIC code data.

4.4.2 SEG Sample

As noted in Section 4.3.2, the 1998 sales values relating to the non-financial and the financial segment of 322 SEG sample companies were downloaded from the database. Each of these two segments was treated as a separate entity and the Primary SIC code of the sample company was allocated to the non-financial segment (hereafter termed "SEG sample company segment 1" or "segment 1" where the context is clear). The appropriate SIC code was allocated to the financial segment on the basis of the largest financial services activity within the segment. The financial segment is hereafter termed "SEG sample company segment 2" or "segment 2". A match company was then sought for each of segments 1 and 2 of each sample company on the basis of the following rules. The match company paired with segment 1 is hereafter called "SEG match company 1" or "match company 1" whilst the match company paired with segment 2 is hereafter called "SEG match company 2" or "match company 2". The rules followed were:

(i) the geographic location of match companies 1 and 2 should be in the same country as the sample company.

(ii) the Primary and Additional SIC codes of match companies 1 should not include any of the SIC codes indicating a financial services activity as defined in Section 4.3.1.

(iii) the Primary SIC codes of match companies 2 should be one of the SIC codes indicating a financial services activity as defined in Section 4.3.1.

(iv) a match company should be paired only once with a sample company segment.

(v) the sample company segments and match companies should be paired on the basis of their US SIC codes and 1998 sales values as follows:

- firstly, sample company segments should be paired at the four-digit level with match companies whose sales value did not differ by more than 25% from those of the sample company segments.

- if no suitable match company was found, an attempt would be made to match at the three-digit and two-digit levels whilst maintaining the maximum difference between the respective sales values at 25%. If an appropriate match company was still not found, the sample company segment would be paired with any suitable company falling within the 25% difference range.

- if a suitable match company was not found at this stage, the above process would be repeated at the 25% + to 50% difference level between the respective sales values and subsequently at the 50% + to 75% and at the 75% + to 100% difference levels.

(vi) as a minimum, 1998 Investment Return data should be available for each sample company. Going backward from 1998, the match companies should have at least as many years of uninterrupted Investment Return data on the database as the sample companies. If the match companies had more years of Investment Return data than the sample companies, the additional years' data would be discarded.

Having established the above rules for pairing the sample company segments and match companies, data relating to the 1998 sales values of all the companies on the database were downloaded in pounds sterling. (As in the case of the SIC sample, this introduced an exchange rate effect into the matching process but this effect should be marginal for the reasons noted in Section 4.4.1). The data relating to Investment Return for the 1989 - 1998 period for all the companies on the database was already available from the SIC sample exercise. As in the case of the SIC sample, a computer program was written for the author by his firm's data processing department using the Access and Visual Basic software to identify the match companies by processing the SIC code, sales value and Investment Return data of the 322 SEG sample companies according to the rules described above. A check was made to ensure that the total sales value of the non-financial segment and the financial segment equalled the total sales value reported by each company and differences were noted which arose due to items such as sales taxes

in the segmental data being eliminated on consolidation to the company's total sales value. Since it was not possible to allocate the discrepancy between the financial and non-financial segment, differences of up to 20% with the total sales value were accepted but 11 companies which showed a greater discrepancy were eliminated from the sample. In the majority of cases (85.4% of the sample) the discrepancies amounted to less than 5% of the total sales whilst in the case of 92.2% of the sample the discrepancies amounted to less than 10% of the total sales.

The data processing exercise outlined above resulted in the identification of 296 match companies which were paired with the non-financial and financial segments of 148 SEG sample companies, it being necessary to identify two match companies for each sample company. The reasons for the reduction in sample size are shown in Table 4.15 from which it may be noted that particular difficulty was experienced in finding suitable matches for the sample companies' financial segments in view of the relatively limited number of companies on the database which had a Primary SIC code indicating a financial services activity.

TABLE 4.15: SEG SAMPLE SIZE

FACTORS AFFECTING SAMPLE SIZE	SEG SAMPLE COMPANIES
INITIAL SAMPLE SIZE	435
1998 SAMPLE COMPANY SALES OR IR DATA NOT AVAILABLE	-141
SEGMENTAL SALES TOTAL > 120% OF TOTAL SALES	-11
NO MATCH FOUND FOR NON-FINANCIAL SEGMENT	-5
NO MATCH FOUND FOR FINANCIAL SEGMENT	-130
FINAL SAMPLE SIZE	148

Having identified the 296 pairs of sample company segments and match companies, paired sample t-tests were carried out to ensure that the differences between their respective mean sales values were not statistically significant. The results of the t-tests are presented in Table 4.16 and show a t-value of 1.472 in the case of the non-financial segment and a t-value of - 0.754 in the case of the financial segment which indicate that the differences between the sample and match companies' mean sales values in each segment are not statistically significant. The Pearson correlation coefficients stands at 0.966 in the case of the non-financial segment data and at 0.995 in the case of the financial segment data (where 1.0 denotes a perfect linear relationship) which denote a close relationship between the data sets. In both cases, the correlation is significant at the 1% level.

TABLE 4.16: SEG SAMPLE MATCHING RESULTS

SAMPLE	N	SAMPLE MEAN	MATCH MEAN	DIFFERENCE	t-value	t-prob. (2-tailed)
NON-FINANCIAL SEGMENT	148	4,035.8^	3,639.1^	396.7^	1.472	.143
FINANCIAL SEGMENT	148	364.4^	380.7^	-16.3^	- 0.754	.452

^ Pounds sterling million

The final results of the matching process for the SEG sample are also tabulated in Tables 4.17 and 4.18. Table 4.17 shows the number and proportion of sample company segments and match companies which were matched at the four-digit, three-digit, two-digit and one-digit levels.

TABLE 4.17: SEG SAMPLE MATCHING RESULTS BY SIC CODE

SIC CODE LEVEL	NON-FINANCIAL SEGMENT		FINANCIAL SEGMENT	
	NUMBER OF COMPANIES	PROPORTION OF COMPANIES	NUMBER OF COMPANIES	PROPORTION OF COMPANIES
4 DIGIT	35	23.6%	23	15.5%
3 DIGIT	16	10.8%	10	6.8%
2 DIGIT	21	14.2%	19	12.8%
1 DIGIT	76	51.4%	96	64.9%
TOTAL	148	100.0%	148	100.0%

Table 4.18 presents the number and proportion of sample company segments and match companies which were matched at the 25%, 50%, 75% and 100% difference levels between their respective sales values.

TABLE 4.18: SEG SAMPLE MATCHING RESULTS BY SALES VALUE % DIFFERENCE

% DIFFERENCE	NON-FINANCIAL SEGMENT		FINANCIAL SEGMENT	
	NUMBER OF COMPANIES	PROPORTION OF COMPANIES	NUMBER OF COMPANIES	PROPORTION OF COMPANIES
UP TO 25%	145	98.0%	113	76.3%
25%+ TO 50%	1	0.7%	22	14.9%
50%+ TO 75%	2	1.3%	6	4.1%
75%+ TO 100%			7	4.7%
TOTAL	148	100.0%	148	100.0%

As can be seen from Table 4.18, the paired sample company segments and match companies were closely matched in terms of their sales value data. In the case of the non-financial segment, the percentage difference between the sales value of the paired entities was 25% or less in the case of 98% of the companies whilst in the case of the financial segment the percentage difference was 25% or less in the case of 76.3% of the companies. On the other hand, Table 4.17 indicates that the companies were less closely matched on the basis of their SIC codes, in view of the fact that only 48.6% of the non-financial segment pairs and 35.1% of the financial segment pairs were matched at up to the 2-digit level.

Having identified the 296 match companies which were paired with the non-financial and financial segments of the 148 sample companies, the financial results of each match company 1 and match company 2 were amalgamated in the manner described in Section 4.6.2 below to serve as a benchmark against which to compare the sample companies' financial performance.

4.5 Discussion on Sample Selection

Several objectives were met by carrying out the matching process in the manner described above, as follows:

- by specifying that the geographical location of the matched pairs of companies should be in the same country, it was as far as possible ensured that both sample and match companies were subject to the same political, economic, social and business environments during the periods under study. Furthermore, both sample and match companies would have been regulated by the same accounting principles and conventions which, as discussed in Section 3.5, can vary substantially between countries. (As noted in Section 4.2, the effects of this factor are further reduced by Worldscope's utilisation of standardised accounting terms and templates in the treatment and presentation of financial data on the database).

- in the case of the SIC sample, as discussed in detail in Section 3.6, by matching the experimental and control companies as closely as possible on the basis of their market capitalisation and market-to-book ratios, it was ensured that equivalence

between the two groups was maintained with respect to the two most important extraneous variables relating to the companies' share returns. In the case of the SEG sample, this objective was achieved only insofar as the sample and match companies' sales value data may proxy for the companies' size.

- in both the SIC and SEG samples, the sample and match companies were paired on their respective criteria on data relating to 1998; this point in time was chosen primarily due to the fact that segmental sales value data for the SEG sample was only available for 1998 in the case of most of the companies on the database. By carrying out the matching process for both samples on the basis of 1998 data, it was ensured that the two samples were comparable in terms of the time period in which the pairs in the samples were matched.

- by requiring that the match companies had at least as many years of uninterrupted Investment Return data on the database as the sample companies with which they were being paired, it was as far as possible ensured that the match companies had been operating for at least as long as the sample companies. This rule eliminated the potential bias which may have arisen had the sample companies been paired with match companies which were newer and younger than the sample companies.

- in the SEG sample, the creation of pseudo match companies made up of companies which are not involved in the financial services industry and specialist firms in this sector allows comparisons to be made between the non-financial companies' financial results and the financial results of stand-alone businesses in the financial and non-financial activities engaged in by the non-financial companies.

4.6 Financial Data

4.6.1 SIC Sample

Once the sample and match companies making up the final SIC sample were identified, data relating to Return on Assets (ROA), Return on Invested Capital (ROIC) and Return on Equity (ROE) for each of the companies for each year between 1989 and 1998 were

downloaded from the Worldscope database and, together with similar data for Investment Return (IR) which had already been downloaded as part of the matching exercise, transferred to Excel spreadsheets for further processing. The nature of IR and the three accounting ratios has been discussed in Section 3.6 and their method of calculation by Worldscope is shown in Appendix A.

In the case of IR, the annual data for each of the 716 sample and match companies were compounded as per formula (2) shown in Section 3.6 and the data for each pair of companies were then transferred from the Excel spreadsheets to SPSS where paired sample t-tests and Wilcoxon signed ranks tests were carried out on the data. The number of years for which IR data were available for the 716 pairs of companies in the SIC sample differed - in some pairs of companies the data were available for the full ten-year period between 1989 - 1998 whilst in other pairs of companies the data were available for a fewer number of years. For robustness, it was decided to carry out a further analysis including only those pairs of companies for which uninterrupted IR data for 1989 - 1998 and/or 1989 - 1993 and/or 1994 - 1998 were available, as shown in Table 4.19. The results of these analyses are presented in Chapters 5 and 6 whilst a similar analysis for ROA, ROIC and ROE is carried out in Chapter 7.

4.6.2 SEG Sample

In the case of the SEG sample, the above data for each match company 1 and match company 2 for each year between 1989 and 1998 were downloaded from the database, the data for the sample companies having already been downloaded as part of the SIC sample exercise. In the case of each sample company, a proportion of each match company 1's annual IR, ROA, ROIC and ROE corresponding to the percentage of non-financial sales in the sample company was then taken and added to a proportion of match company 2's annual IR, ROA, ROIC, and ROE corresponding to the percentage of financial sales in the sample company. Thus, if 90% of sample company A's sales value was non-financial whilst 10% was financial, 90% of match company 1's annual ROA was added to 10% of match company 2's annual ROA to derive the annual ROA of a pseudo company made up of the combined ROA's of a company not involved in financial services and of a financial services company. The pseudo company is hereafter

referred to as the "SEG pseudo match company" or as the "SEG match company" or as the "match company" where the context is clear.

As in the case of the SIC sample, the annual IR data for each of the 148 sample and pseudo match companies were compounded and the data for each pair of companies were transferred from the Excel spreadsheets to SPSS for statistical testing. For robustness, a further analysis was carried out including only those pairs of companies for which uninterrupted IR data for 1989 - 1998 and/or 1994 - 1998 and/or 1989 - 1993 were available, as shown in Table 4.19. The results of these analyses are presented in Chapters 5 and 6 whilst a similar analysis for ROA, ROIC and ROE is carried out in Chapter 7.

The number of pairs of companies for which uninterrupted five-year and ten-year IR data were available in the SIC sample and the SEG sample is shown in Table 4.19.

TABLE 4.19: SIC AND SEG SAMPLES 5-YEAR AND 10-YEAR IR DATA

PERIOD	SIC SAMPLE PAIRS	SEG SAMPLE PAIRS
1989 - 1998 (10 YEARS)	309	65
1989 - 1993 (5 YEARS)	312	65
1994 - 1998 (5 YEARS)	488	98
MINIMUM 1998 DATA	716	148

With regard to ROA, ROIC and ROE, the number of pairs of companies for which uninterrupted five-year and ten-year data were available are similar to the above as shown in the Tables presented in Chapter 7.

As shown in Table 4.19, the size of the SIC sample amounts to 716 pairs of companies for which IR data for at least 1998 were available. Uninterrupted IR data were available for 309 pairs of companies in the 1989 - 1998 period, 312 for the 1989 - 1993 period and 488 for the 1994 - 1998 period. In the case of the SEG sample, IR data for at least 1998 were available for 148 pairs of companies whilst uninterrupted IR data were available for 65 pairs of companies in the 1989 - 1998 period, 65 in the 1989 - 1993 period and 98 in the 1994 - 1998 period. Heiman (1992) remarks that a sample size of at least 30 is generally needed in statistical tests for minimal power. Increasing the sample

size to 120 adds substantially to the power of the tests though increases beyond this level do not add power in proportion to the increase in sample size. As shown above, both the SIC and SEG sample sizes are well above the level of 30 required for minimal power.

4.7 Pilot Study

At all stages of the processes described in Sections 4.3, 4.4 and 4.6 above, pilot testing on the data relating to the U.K. was carried out before the data relating to the other countries were processed to validate the data processing methods being used. The activities covered by the pilot tests included:

- downloading data from the Worldscope database resident at Henley Management College through the internet (Section 4.3).

- identifying the SIC sample companies and the SEG sample companies (Section 4.3).

- testing computer programs relating to the matching process (Section 4.4).

- building Excel models to process the financial data (Section 4.6).

- using SPSS routines to carry out statistical tests on the data (Chapters 5, 6 and 7).

The pilot studies served to test the computer programs and Excel models which were developed to process the data used in this study. Several improvements were made to the computer routines and Excel models and computer programming 'bugs' identified and removed before the data relating to the final SIC and SEG samples were processed.

4.8 Alternative Methodologies

As outlined in Sections 3.6 and 3.7, the research methodology adopted in this Thesis is the quasi-experimental method whereby the financial performance of a number of firms which have diversified into the financial services industry (the experimental or sample or non-financial companies) is compared with the financial performance of a number of firms which have not diversified into the industry (the control or match companies) to determine whether the financial performance of the former firms is significantly different to that of the latter firms. Share return is used in the study as the main measure of financial performance on the basis of the arguments made in Section 3.5. As described in Section 4.4, following Fama and French (1992), the firms in the experimental and control groups were matched on the basis of their size and market-to-book ratios. The matching process was carried out on the basis of 1998 data, which represents the last year of the period under study, due to the facts that (a) the SIC code information available on the database related to that year and (b) segmental sales value data for the SEG sample was only available for 1998 in the case of most of the companies on the database. By carrying out the matching process for both the SIC and SEG samples on the basis of 1998 data, it was ensured that the two samples were comparable in terms of the time period in which the pairs in the samples were matched.

It is recognised that alternative methodologies could have been utilised in conducting the study. Damodaran (2002) observes that tests of abnormal share return performance always imply the testing of a joint model. The researcher must either assume that the model or procedure he or she is using is appropriate and then test for abnormal performance or, alternatively, assume that there is no abnormal performance and test the model or procedure. It is not possible to distinguish between these two aspects and, in the case of this study, the former assumption is being made. Given this assumption, there are two basic approaches to testing for abnormal performance, namely specifying an asset pricing model or making comparisons against a benchmark (Fama (1998)). In the former approach, an asset pricing model such as the Capital Asset Pricing Model, Arbitrage Pricing Theory or the Fama-French three-factor model is used to generate expected returns for a particular security or portfolio and the expected returns are then compared to the actual returns. In the latter approach, the returns for a security or portfolio having particular characteristics are compared with those of a benchmark over

a period of time to determine whether the returns from the former securities were abnormally higher or lower than the returns from the latter.

As noted above, an asset pricing model such as the Capital Asset Pricing Model (CAPM), Arbitrage Pricing Theory (APT) or the Fama-French three-factor model could have been used in this study to generate expected returns for the experimental companies' securities which would then have been compared with the actual returns. The CAPM has been extensively discussed in Sections 2.3.3.4 and 3.4 where it was noted that in this asset pricing model systematic risk (beta) plays an important part in determining the rate of return investors expect to earn from a firm's securities. It was however also noted that criticism has been levelled at the CAPM, particularly on the grounds that the empirical evidence indicates that beta may not adequately capture all the elements of market risk and that consequently the CAPM does not describe the risk-return relationship satisfactorily (Mills (1994)). Thus, in a landmark study Fama and French (1992) challenged beta's role in explaining stock returns and concluded that size and market-to-book ratio "...provide a simple and powerful characterization of the cross-section of average stock returns." Fama and French (1996a) proceed to formulate a three-factor model which takes account of firms' size and market-to-book ratios, as well as beta, in explaining stock returns. Finally, in the Arbitrage Pricing Theory (APT), securities' expected returns are determined on the basis of the securities' degree of sensitivity to a number of factors such as Gross National Product, interest rates and inflation rates.

Whilst the CAPM could have been utilised in the conduct of this study, as discussed above severe controversy surrounds the validity of this model. In the case of the APT, there in no general agreement on the factors to use in the construction of the model, particularly when comparisons are being made between firms in different countries as in this study. The three-factor model could have been utilised by regressing the sample companies' stock returns over the study period against a size factor (the return on a portfolio of small companies' stocks less the return on a portfolio of large companies' stocks), a market-to-book ratio factor (the return on a portfolio of high market-to-book ratio companies' stocks less the return on a portfolio of low market-to-book ratio companies' stocks) and beta to determine whether the sample companies' share returns were better or worse than expected. However, whilst these factors are readily available

for U.S. stocks, the U.S. data does not necessarily apply to other countries and it would have been impracticable to construct portfolios of large and small companies' stocks, as well as portfolios of high and low market-to-book ratio companies' stocks for each country in view of the large number of countries from which the sample companies were drawn. Obtaining beta values for portfolios of stocks in the different countries would also have been problematic. Furthermore, the statistical tests carried out by Barber and Lyon (1997a) do not indicate that this approach is preferable to benchmarking firms' share returns.

As an alternative to using an asset pricing model, the share returns of the firms in an experimental group may be compared to those of a benchmark such as a reference portfolio or individually matched companies. In the case of a reference portfolio, the share market index for a particular country, or the share returns for a portfolio of companies in that country, are commonly utilised as benchmarks. Whilst this approach has the advantages that (i) it allows the analysis to be carried out within particular countries and (ii) it reduces the random variation which may arise when individual companies' share returns are used for benchmarking purposes, the approach also suffers from certain biases, namely (a) the 'new listing' bias which arises because a reference portfolio would typically include firms which have been listed for a shorter period than the experimental companies and which would therefore tend to underperform the market average (Ritter (1991)) (b) the skewness bias which occurs because (Barber and Lyon (1997a)) the individual Holding Period Returns (HPR's) of sample firms are commonly higher than the average HPR of the firms constituting a reference portfolio and (c) the rebalancing bias which arises because the returns on reference portfolios are typically calculated assuming periodic rebalancing i.e. a portfolio's HPR over a given period (say one year) is calculated by compounding the average HPR of the stocks in the portfolio in each sub-period (say each month). This is contrasted with calculating the HPR of each stock over a year and obtaining the average HPR of the stocks in the portfolio for the year.

Following extensive statistical tests carried out by Barber and Lyon (1997a) and Lyon et al. (1999), the authors conclude that the match firm approach eliminates all of the biases mentioned above since (a) both the sample and match firms would be listed during the period under study (b) the sample and control firms would be equally likely to

experience high positive returns over the study period and (c) both the sample and match firms' returns would be calculated without periodic rebalancing. A further consideration is that, in view of the large number of countries from which the firms in this research study were drawn, it would not have been practicable to construct reference portfolios made up of a large number of companies for each of the countries in the study though a share market index could have been utilised. Although the match firm approach also suffers from certain weaknesses, primarily that (a) it can yield biased results if there is a systematic bias in the way that the match firms are chosen and (b) there can be wide variations in the returns to individual stocks, Barber and Lyon (1997a) conclude that this method gives more robust results than the reference portfolio approach in the simulation tests they carried out. In conclusion, since the match firm approach allows within-country comparisons to be made, eliminates the biases that may arise when reference portfolios are used and has been used in several previous studies such as those by Loughran and Ritter (1995) and Spiess and Affleck-Graves (1999), it was decided to adopt this approach in the conduct of this study.

As noted above, due to data limitations firms were benchmarked on the basis of their 1998 data in this study. 1998 represents the last year of the period (1989 - 1998) under study and, given sufficient data, alternative time periods prior or subsequent to the sample firms' entry into the financial services industry could have been selected for benchmarking purposes. Thus, the financial performance of the sample firms prior to their diversification into the financial services industry could have been compared with their performance after their diversification into the industry. The sample companies' financial performance prior to and after diversifying into the financial services industry could also have been compared with that of match firms which did not diversify into the industry. This approach would have had the advantage of separating the sample companies' financial performance into the periods prior to and subsequent to their diversification into the financial services industry which could have more clearly identified the effects of their diversification upon their financial performance. The approach adopted, whereby the matching process was carried out on the basis of 1998 data, which represents the last year of the period under study, results in a limitation to the study insofar as it cannot be conclusively stated that the sample companies' financial performance during the period was affected by their diversification into the financial services industry or, conversely, that the sample companies' financial

performance during the period led them to diversify into the industry. However, as noted above, due to data limitations it was not possible to identify the point in time in when the sample companies diversified into the financial services industry.

Lyon et al. (1999) observe that, since unusually high or low stock returns may precede an event under study such as a take-over bid, an important dimension to consider when matching firms is their stock return performance prior to the event, and subsequent research investigations such as that by Conn et al. (2001) matched firms on the basis of size and prior share performance. It is however documented by Barber and Lyon (1997a) and Lyon et al. (1999) that failure to control for market-to-book ratio would bias the study results (and this factor is indeed also controlled for in the Conn et al. (2001) study cited). There is however no documentary evidence to indicate that firms' diversification into the financial services industry is preceded by unusually high or low stock returns. Furthermore, since in this study data relating to firms' diversification into the financial services industry was only available for the last year of the ten-year period under study, matching on the basis of the sample and match companies' prior stock return performance would have resulted in a similar performance for the two groups of firms over the period.

4.9 Summary

The process undertaken to collect and organise the data required to test the hypotheses formulated in Chapter 3 was described in detail in this Chapter. The structure of the Worldscope database was outlined in Section 4.2 and this was followed by a discussion on the procedures used to identify the sample and match companies in Sections 4.3 and 4.4 respectively. Some observations on the sample selection process were made in Section 4.5 whilst Section 4.6 described the financial data collected for each of the sample and match companies. Finally, the Pilot Study carried out to test the sample selection process was outlined in Section 4.7 and alternative methodological approaches to carrying out the study were discussed in Section 4.8.

CHAPTER 5: RESULTS I - INVESTMENT RETURN OVERALL RESULTS

5.1 Introduction

As discussed in Section 3.6, in this study Investment Return (IR) is held to be the main gauge of a company's financial performance. Accordingly, the analysis of the data relating to the SIC and SEG sample and match companies obtained through the data collection process described in Chapter 4 begins with a review of the overall IR results in this Chapter and conclusions based on this analysis are reached. This is followed in Chapter 6 by further analysis of the IR data on the basis of the sample companies' financial services activities, their geographic location, their primary industry and their segmental sales data to examine the business activities of the sample and match companies in further depth. Subsequently, the results relating to the accounting ratio data are presented, analysed and discussed in Chapter 7. Finally, in Chapter 8 the conclusions reached from these analyses are synthesised with the theoretical arguments and hypotheses made in previous Chapters. Before commencing the analysis in this Chapter, a brief outline of the global economic and financial environment in the 1990's is presented in Section 5.2 to serve as a background for the discussion on the sample and match companies' financial performance in later Sections.

The review of the overall IR results in this Chapter commences in Section 5.3 with an analysis of the IR data obtained for the 716 pairs of companies in the SIC sample and the 148 pairs of companies in the SEG sample. In the analysis, parametric and non-parametric statistical tests are carried out to determine whether any statistically significant differences exist between the financial performance of the sample and match companies. Robustness tests are then carried out in Section 5.4 to determine whether the results obtained in Section 5.3 are affected by removing outliers and the results obtained in Sections 5.3 and 5.4 are summarised and discussed in Section 5.5. Further robustness tests using only uninterrupted IR data for the 1989 - 1998, 1989 - 1993 and 1994 - 1998 periods are carried out in Section 5.6. (As noted in Section 4.6, the number of years for which IR data were available for the 716 pairs of companies in the SIC sample differed - in some cases the data were available for the full ten-year period between 1989 - 1998

whilst in other pairs the data were available for a fewer number of years and the same applies to the SEG sample). Further parametric and non-parametric statistical tests are carried out and it is concluded that the results of the robustness tests are generally consistent with the initial results. Finally a summary of, and conclusions on, the results are provided in Section 5.7.

5.2 Economic and Financial Background

A brief outline of the global economic and financial environment in the 1990's is presented in this Section to serve as a background for the discussion on the sample and match companies' financial performance in later Sections.

5.2.1 World Economic Conditions in the 1990's

The period between 1989 and 1998 may be generally described as an expansionary phase for the world economy. The International Monetary Fund data shown in summary form in Table 5.1 and in greater detail in Appendix G indicate that the world's Gross Domestic Product (GDP) in constant prices increased steadily at an average annual rate of 3.1% over this period. GDP growth in the earlier five-year period (1989 - 1993) registered an average annual rate of 2.5% and the average annual growth rate increased to 3.7% between 1994 and 1998. Although steady growth was experienced in various economies over this period, this was accompanied by relatively low inflation and unemployment levels in several countries.

TABLE 5.1: GDP % MOVEMENT IN CONSTANT PRICES*

REGION/COUNTRY	1989 - 1993	1994 - 1998	1989 - 1998
WORLD	2.5	3.7	3.1
UNITED STATES	2.1	3.8	3.0
EUROPEAN UNION	1.9	2.5	2.2
JAPAN	3.0	1.4	2.2
NEWLY INDUSTRIALISED ASIAN ECONOMIES ^	6.9	5.0	5.9

*Source: IMF World Economic Outlook Database December 2001

^ Korea, Hong Kong, Singapore, Taiwan

Marked differences were apparent in the economic performance of certain regions and countries, however. Thus, for example, the increase in GDP in the U.S. was in line with that of the world economy, with an average annual rate of 3.0% over the ten-year period and a lower average annual rate of growth in the earlier five-year period (2.1%) than in the later period (3.8%). Strong consumer demand coupled with prudent fiscal and monetary policies were major factors which drove economic growth in this country. Similarly, the Economic Union recorded an average annual increase in GDP of 1.9% between 1989 and 1993 followed by 2.5% in the 1994 - 1998 period, resulting in an overall average annual increase of 2.2% between 1989 and 1998. Similar growth patterns occurred in several of the major countries comprising the Economic Union where inflation and unemployment levels were generally under control.

Higher than average overall growth rates occurred in several Asian economies in the earlier part of the 1990's as a result of strong export growth and high domestic demand but the rate of growth dropped in the later five-year period partly due to appreciating exchange rates and external account deficits and a contraction in GDP was experienced in 1998 in certain countries. Contrary to the general trend, the Japanese economy suffered from several vicissitudes over the ten-year period. Growth dropped sharply after 1990 and the annual increases in GDP in subsequent years were at modest levels with a reduction of 1% occurring in 1998. Consumer demand in this country was generally weak whilst unemployment levels were relatively high. Furthermore, difficulties were experienced in the country's financial sector as a result of bad debts incurred during the 1980's.

5.2.2 Stock Market Indices Movements in the 1990's

The developments in the world's major economies outlined above were reflected in the movements of the stock market indices in the respective countries. Table 5.2 shows the percentage movements in the Morgan Stanley Capital International (MSCI) stock market indices for certain regions and countries.

TABLE 5.2: MSCI STOCK MARKET INDICES % MOVEMENT

REGION/COUNTRY	1989 - 1993	1994 - 1998	1989 - 1998
WORLD	21.1	92.1	132.6
N. AMERICA	64.8	166.8	339.6
EUROPE	51.0	116.9	227.6
JAPAN	-32.3	-19.8	-45.6
HONG KONG	309.2	-23.3	213.7
SINGAPORE	158.4	-40.1	54.7

As may be seen from Table 5.2, the stock market indices for the World, North America and Europe showed an upward movement in the years under consideration with the increase in the 1994 - 1998 period being greater than that in the 1989 - 1993 period. Japan shows a negative trend in all the time periods whilst in Hong Kong and Singapore a strong upward trend in the 1989 - 1993 period was followed by a downturn in the 1994 - 1998 period with a positive movement for the ten-year period as a whole.

Detailed comparisons between the MSCI stock market indices and the non-financial companies' IR results are made in Section 6.3.3 below.

5.3 Full Data Results

5.3.1 SIC Sample

As outlined in the previous Chapter, the SIC sample was formed by identifying 716 companies on the Worldscope database whose SIC codes indicated that they were involved in the provision of financial services but derived the major part of their income from other business activities. Match companies were then identified for each of the 716 SIC sample companies on the basis of their not being involved in providing financial services, their geographic location and their market capitalisation and market-to-book ratio data. IR data for each year from 1989 to 1998 were downloaded from the database for each sample and match company in order to determine whether any statistically significant differences existed between the financial performance of the sample and match companies.

TABLE 5.3: SIC SAMPLE IR % 1989 - 1998:- FULL DATA

SAMPLE COMPANIES 1989 - 1993

	1989	1990	1991	1992	1993	Mean 1989-1993	Cumulative^ 1989-1993
N	322	351	388	404	447	5	456
Mean IR for period	22.846	-5.816	15.166	8.114	42.303	16.523	96.9
IR > 0	230	115	208	211	350	4	293
IR < 0	91	236	179	190	94	1	163
IR = 0	1	0	1	3	3	0	0
Total	322	351	388	404	447	5	456

SAMPLE COMPANIES 1994 - 1998

	1994	1995	1996	1997	1998	Mean 1994-1998	Cumulative^ 1994-1998
N	498	552	622	669	716	5	716
Mean IR for period	0.249	12.668	17.434	5.374	-3.667	6.411	38.113
IR > 0	204	341	367	323	265	4	301
IR < 0	292	209	254	345	445	1	415
IR = 0	2	2	1	1	6	0	0
Total	498	552	622	669	716	5	716

SAMPLE COMPANIES 1989-1998

Mean 1989-1998	Cumulative^ 1989-1998
10	716
11.467	140.19
8	344
2	372
0	0
10	716

MATCH COMPANIES 1989 - 1993

	1989	1990	1991	1992	1993	Mean 1989-1993	Cumulative^ 1989-1993
N	322	351	388	404	447	5	456
Mean IR for period	28.275	-5.482	8.92	4.178	42.22	15.622	83.39
IR > 0	234	119	189	200	347	4	294
IR < 0	87	232	199	203	99	1	162
IR = 0	1	0	0	1	1	0	0
Total	322	351	388	404	447	5	456

MATCH COMPANIES 1994 - 1998

	1994	1995	1996	1997	1998	Mean 1994-1998	Cumulative^ 1994-1998
N	498	552	622	669	716	5	716
Mean IR for period	2.411	13.129	11.595	0.658	-4.48	4.663	18.846
IR > 0	208	351	351	289	270	4	302
IR < 0	287	197	269	378	442	1	414
IR = 0	3	4	2	2	4	0	0
Total	498	552	622	669	716	5	716

MATCH COMPANIES 1989-1998

Mean 1989-1998	Cumulative^ 1989-1998
10	716
10.142	119.782
8	344
2	372
0	0
10	716

DIFFERENCES SAMPLE - MATCH COMPANIES 1989 - 1993

	1989	1990	1991	1992	1993	Mean 1989-1993	Cumulative^ 1989-1993
N	322	351	388	404	447	5	456
Mean IR for period	-5.429	-0.334	6.246	3.937	0.082	0.9	13.511
Paired-sample t-test:							
t-value	-1.321	-0.104	1.81	1.441	0.02	0.45	1.185
t-probability (2-tailed)	0.188	0.917	0.071 *	0.15	0.984	0.676	0.237
Sample > Match	153	162	208	217	231	3	234
Sample < Match	169	189	180	187	216	2	222
Total	322	351	388	404	447	5	456
Paired-sample Wilcoxon signed ranks test							
z-value	-0.973	-1.008	2.615	1.369	1.243	0.405	0.855
z-probability (2-tailed)	0.33	0.313	0.009 ***	0.171	0.214	0.686	0.393

DIFFERENCES SAMPLE - MATCH COMPANIES 1994 - 1998

	1994	1995	1996	1997	1998	Mean 1994-1998	Cumulative^ 1994-1998
N	498	552	622	669	716	5	716
Mean IR for period	-2.162	-0.462	5.84	4.716	0.812	1.749	19.268
Paired-sample t-test:							
t-value	-0.992	-0.188	2.602	1.81	0.32	1.146	2.626
t-probability (2-tailed)	0.322	0.851	0.009 ***	0.071 *	0.749	0.316	0.009 ***
Sample > Match	248	275	346	357	356	3	357
Sample < Match	250	277	276	312	360	2	359
Total	498	552	622	669	716	5	716
Paired-sample Wilcoxon signed ranks test							
z-value	-1.038	-0.724	2.435	2.516	-0.376	0.944	1.55
z-probability (2-tailed)	0.299	0.469	0.015 **	0.012 **	0.707	0.345	0.121

DIFFERENCES SAMPLE-MATCH COMPANIES 1989-1998

Mean 1989-1998	Cumulative^ 1989-1998
10	716
1.325	20.408
1.109	0.619
0.296	0.536
6	352
4	364
10	716
0.968	1.645
0.333	0.1 *

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

^ As discussed in Section 5.3, the data in these Columns are based on incomplete periods of years in the case of some pairs of companies and the data should therefore be interpreted in relative rather than absolute terms.

A summary of the results obtained from the statistical processing on SPSS of the IR results of the 716 pairs of companies in the SIC sample is presented in Table 5.3. The Table shows the results of both the parametric (paired sample t-test) analyses and of the non-parametric (Wilcoxon signed ranks test) analyses, the properties of which have been discussed in Section 3.3. Probability levels of 10%, 5% and 1% are indicated by the appropriate asterisk and reflect a statistically significant difference in the performance of the matched set of firms. A positive significant t-value in the paired sample t-test, or z-value in the Wilcoxon signed ranks test, indicates a statistically significant difference in favour of the sample firms.

As noted above, the number of years for which IR data were available for the 716 pairs of companies in the SIC sample differs - in some pairs of companies the data were available for the full ten-year period between 1989 - 1998 whilst in other pairs of companies the data were available for a fewer number of years. However, since an equal number of years of IR data were available for each pair of sample and match companies, conclusions may be drawn from the total sample with respect to the annual IR data and also with respect to the differences between the compounded IR results of the sample and match companies. The varying time periods for which IR data are available for the different pairs of companies means, however, that the data cannot be used to make comparisons in absolute terms between, for example, the sample companies' compounded IR values and the MSCI indices presented above. Comparisons may however be made between the indices and the uninterrupted five and ten-year IR data presented in Section 5.6.

To clarify the method of calculation of the data in Table 5.3, a hypothetical example of the calculations is provided in Table 5.4 below:

TABLE 5.4: EXAMPLE OF IR CALCULATIONS

	A	B	C	D	E	F
COMPANY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
SAMPLE COMPANY A	10%	15%	5%			32.8%
SAMPLE COMPANY B	25%	20%	-10%	40%	50%	183.5%
SAMPLE COMPANY C	-5%	10%	15%	-20%	-10%	-13.5%
SAMPLE COMPANY D	5%					5%
SAMPLE COMPANY E	-20%	5%	-25%	-10%		-43.3%
MEAN IR FOR PERIOD	3%	12.5%	-3.8%	3.3%	20%	32.9%
AVERAGE OF MEAN ANNUAL IR's						7.0%

In Table 5.4, the figures in columns A to E represent each sample company's annual IR value calculated as per formula (1) in Section 3.6, namely:

$$IR = \frac{(P_t - P_{t-1}) + \text{dividends paid}}{P_{t-1}} * 100$$

The mean annual IR values for the sample companies (3%, 12.5% etc.) are then obtained by averaging the data in each of columns A to E.

Each company's annual IR figures are compounded on the basis of formula (2) in Section 3.6 and are displayed in column F of Table 5.4. The formula used is:

$$IR(k) = ((1+(IR_1/100))(1+(IR_2/100))\ldots(1+(IR_k/100)) - 1) * 100$$

IR(k) represents the Holding Period Return for a given number of years which, as discussed in Section 3.6, is held to be the main measure of a firm's financial performance in this Thesis. The mean of the compounded annual IR's (32.9%) is then obtained by averaging the data in column F.

Finally, the average of the mean annual IR's (7%) is obtained by averaging the mean annual IR's in columns A to E. This represents the average annual return on a portfolio that invests equal monetary amounts in each sample firm at the beginning of the year and holds the portfolio until the end of the year.

The main conclusions which may be reached from the data presented in Table 5.3 with regard to the sample of non-financial companies and the sample of match companies taken separately are as follows:

- in the years between 1989 and 1998, the mean annual IR's of the sample and match companies are generally positive. Negative mean annual IR's are registered by the sample companies in 1990 and 1998 (-5.8% and -3.7% respectively) and by the match companies in the same years (-5.5% and -4.5% respectively). The mean annual IR's are thus positive in 8 of the 10 years in the case of both the sample and match companies.

- the average of the mean annual IR's is also positive for both the sample and match companies with values of 11.5% for the sample companies in the 1989 - 1998 period and 10.1% for the match companies over the same period.

The positive results are reflected in the two sub-periods: the figures for the sample companies register 16.5% in the 1989 - 1993 period and 6.4% in the 1994 - 1998 period. The corresponding figures for the match companies are 15.6% and 4.7%.

- finally, the mean of the compounded annual IR's is positive for both the sample and match companies with values of 140.2% for the sample companies in the 1989 - 1998 period and 119.8% for the match companies over the same period.

The positive results are again reflected in the two sub-periods. The figures for the sample companies register 96.9% in the 1989 - 1993 period and 38.1% in the 1994 - 1998 period whilst the corresponding figures for the match companies are 83.4% and 18.8%.

The main conclusions which may be reached from the information presented in Table 5.3 with regard to the differences between the data relating to the sample and match companies are as follows:

- the mean annual IR's of the sample companies are higher than those of the match companies in 6 of the years between 1989 and 1998 and lower in 4 of the

years. The difference between the sample and match companies' results is statistically significant in favour of the sample companies in both the paired sample t-test and the Wilcoxon signed ranks test in 1991, 1996 and 1997.

- the average of the mean annual IR's is higher for the sample than for the match companies over all time periods with differences of 1.3% in the 1989 - 1998 period, 0.9% in the 1989 - 1993 period and 1.7% in the 1994 - 1998 period. None of these differences are statistically significant, however.

- finally, the mean of the compounded annual IR's is again higher for the sample than for the match companies with a difference of 20.4% in the 1989 - 1998 period. The sample companies' superior results are statistically significant in the Wilcoxon signed ranks test at a probability level of 10%.

The non-financial companies' superior results are reflected in the two sub-periods with the differences between the sample and match companies' IR results standing at 13.5% in the 1989 - 1993 period and 19.3% in the 1994 - 1998 period. The latter difference is statistically significant in the paired sample t-test at a probability level of 1%.

5.3.2 SEG Sample

As outlined in the previous Chapter, the SEG sample was formed by identifying 148 SIC sample companies for which 1998 segmental sales data was available. A match company was then selected for the non-financial and financial segment of each SEG sample company on the basis of SIC code, geographic location and sales value. The annual IR results of the two match companies identified for each sample company were then combined on the basis of the relative size of the sample companies' non-financial and financial segments to create a pseudo match company whose IR results are compared to those of the SEG sample companies using similar methods to those utilised in the SIC sample.

A summary of the results obtained from the statistical processing on SPSS of the IR results of the 148 pairs of companies in the SEG sample is presented in Table 5.5. As in the case of the SIC sample, the number of years for which IR data were available for the

TABLE 5.5: SEG SAMPLE IR % 1989 - 1998:- FULL DATA

SAMPLE COMPANIES 1989 - 1993

	1989	1990	1991	1992	1993	Mean 1989-1993	Cumulative^ 1989-1993
N	67	73	78	80	86	5	90
Mean IR for period	17.263	-7.735	26.115	14.503	37.003	17.43	86.27
IR > 0	45	26	52	46	66	4	68
IR < 0	22	47	26	33	19	1	22
IR = 0	0	0	0	1	1	0	0
Total	67	73	78	80	86	5	90

SAMPLE COMPANIES 1994 - 1998

	1994	1995	1996	1997	1998	Mean 1994-1998	Cumulative^ 1994-1998
N	99	112	128	138	148	5	148
Mean IR for period	-6.119	20.476	17.075	7.889	-3.957	7.073	42.603
IR > 0	35	79	83	72	59	3	74
IR < 0	64	33	45	66	88	2	74
IR = 0	0	0	0	0	1	0	0
Total	99	112	128	138	148	5	148

SAMPLE COMPANIES 1989-1998

Mean 1989-1998	Cumulative^ 1989-1998
10	148
12.251	115.954
7	88
3	60
0	0
10	148

MATCH COMPANIES 1989 - 1993

	1989	1990	1991	1992	1993	Mean 1989-1993	Cumulative^ 1989-1993
N	67	73	78	80	86	5	90
Mean IR for period	13.822	-11.434	0.287	9.169	30.683	8.505	36.57
IR > 0	50	22	39	45	62	4	59
IR < 0	17	51	39	35	24	1	31
IR = 0	0	0	0	0	0	0	0
Total	67	73	78	80	86	5	90

MATCH COMPANIES 1994 - 1998

	1994	1995	1996	1997	1998	Mean 1994-1998	Cumulative^ 1994-1998
N	99	112	128	138	148	5	148
Mean IR for period	-4.285	12.551	16.52	18.882	-3.811	7.971	37.897
IR > 0	36	73	80	78	56	3	76
IR < 0	63	39	48	60	92	2	72
IR = 0	0	0	0	0	0	0	0
Total	99	112	128	138	148	5	148

MATCH COMPANIES 1989-1998

Mean 1989-1998	Cumulative^ 1989-1998
10	148
8.238	82.51
7	76
3	72
0	0
10	148

DIFFERENCES SAMPLE - MATCH COMPANIES 1989 - 1993

	1989	1990	1991	1992	1993	Mean 1989-1993	Cumulative^ 1989-1993
N	67	73	78	80	86	5	90
Mean IR for period	3.44	3.699	25.829	5.334	6.32	8.924	49.697
Paired-sample t-test:							
t-value	0.677	0.838	3.968	0.698	0.803	2.095	3.257
t-probability (2-tailed)	0.501	0.405	0 ***	0.487	0.424	0.104	0.002 ***
Sample > Match	31	40	49	38	48	5	60
Sample < Match	36	33	29	42	38	0	30
Total	67	73	78	80	86	5	90
Paired-sample Wilcoxon signed ranks test							
z-value	-0.187	0.58	3.713	0.341	1.608	2.023	3.535
z-probability (2-tailed)	0.851	0.562	0 ***	0.733	0.108	0.043 **	0 ***

DIFFERENCES SAMPLE - MATCH COMPANIES 1994 - 1998

	1994	1995	1996	1997	1998	Mean 1994-1998	Cumulative^ 1994-1998
N	99	112	128	138	148	5	148
Mean IR for period	-1.834	7.925	0.555	-10.993	-0.146	-0.899	4.706
Paired-sample t-test:							
t-value	-0.486	1.826	0.139	-1.658	-0.029	-0.297	0.387
t-probability (2-tailed)	0.628	0.071 *	0.889	0.1 *	0.977	0.781	0.7
Sample > Match	46	61	71	60	77	2	71
Sample < Match	53	51	57	78	71	3	77
Total	99	112	128	138	148	5	148
Paired-sample Wilcoxon signed ranks test							
z-value	-1.058	1.608	0.828	-1.629	0.345	-0.405	-0.123
z-probability (2-tailed)	0.29	0.108	0.408	0.103	0.73	0.686	0.902

DIFFERENCES SAMPLE-MATCH COMPANIES 1989-1998

Mean 1989-1998	Cumulative^ 1989-1998
10	148
4.013	33.444
1.357	1.495
0.208	0.137
7	81
3	67
10	148
1.478	1.122
0.139	0.262

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

^ As discussed in Section 5.3, the data in these Columns are based on incomplete periods of years in the case of some pairs of companies and the data should therefore be interpreted in relative rather than absolute terms.

148 pairs of companies in the SEG sample differs - in some pairs of companies the data were available for the full ten-year period between 1989 - 1998 whilst in other pairs of companies the data were available for a fewer number of years. However, as observed above in the case of the SIC sample, since an equal number of years of IR data are available for each pair of sample and match companies, conclusions may be drawn from the total sample with respect to the annual IR data and also with respect to the differences between the compounded IR results of the sample and match companies though the data cannot be used to make comparisons in absolute terms. The method of calculation of the data in Table 5.5 is similar to that described in Table 5.4.

The main conclusions which may be reached from the data presented in Table 5.5 with regard to the sample of non-financial companies and the sample of match companies taken separately are as follows:

- in the years between 1989 and 1998, the mean annual IR's of the sample and match companies are generally positive. Negative mean annual IR's are registered by the sample companies in 1990, 1994 and 1998 (-7.7%, -6.1% and -4% respectively) and by the match companies in the same years (-11.4%, -4.3% and -3.8% respectively). The mean annual IR's are thus positive in 7 of the 10 years in the case of both the sample and match companies.

- the average of the mean annual IR's is also positive for both the sample and match companies with values of 12.3% for the sample companies in the 1989 - 1998 period and 8.2% for the match companies over the same period.

The positive results are reflected in the two sub-periods: the figures for the sample companies register 17.4% in the 1989 - 1993 period and 7.1% in the 1994 - 1998 period. The corresponding figures for the match companies are 8.5% and 8%.

- finally, the mean of the compounded annual IR's is positive for both the sample and match companies with values of 116% for the sample companies in the 1989 - 1998 period and 82.5% for the match companies over the same period.

The positive results are again reflected in the two sub-periods. The figures for the sample companies register 86.3% in the 1989 - 1993 period and 42.6% in the 1994 - 1998 period. The corresponding figures for the match companies are 36.6% and 37.9%.

The main conclusions which may be reached from the information presented in Table 5.3 with regard to the differences between the data relating to the sample and match companies are as follows:

- the mean annual IR's of the sample companies are higher than those of the match companies in 7 of the years between 1989 and 1998 and lower in 3 of the years. The difference between the sample and match companies' results is statistically significantly in favour of the sample companies in 1991 (in both the paired sample t-test and the Wilcoxon signed ranks test) and in 1995 (in the paired sample t-test). On the other hand, the match companies significantly outperform the non-financial companies in the paired sample t-test in 1997.

- the average of the mean annual IR's is higher for the sample than for the match companies in the 1989 - 1998 period with a difference of 4% being registered between the two group's results.

In the 1989 - 1993 period, the difference between the two groups' results is statistically significantly in favour of the sample companies in the Wilcoxon signed ranks test at a 5% probability level whilst in the 1994 - 1998 period the match companies' mean annual IR's are marginally (0.9%) higher than the non-financial companies.'

- finally, the mean of the compounded annual IR's is higher for the non-financial companies than for the match companies in the 1989 - 1998 period with a difference of 33.4% being registered.

The non-financial companies' superior results are reflected in the two sub-periods with the differences between the sample and match companies' IR results standing at 49.7% in the 1989 - 1993 period and 4.7% in the 1994 - 1998 period. The former difference is statistically significant in both the paired sample t-test and the Wilcoxon signed ranks test at a probability level of 1%.

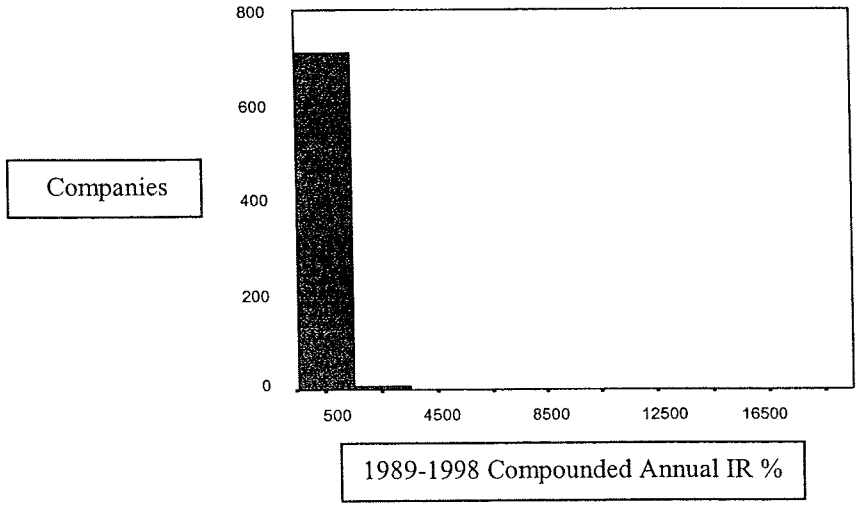
The above analysis of the differences between the IR results of the non-financial companies and the match companies indicates that, in both the SIC and SEG samples, the non-financial companies' IR results are generally superior to those of the match companies. However, before the data is analysed further and conclusions are drawn from the data, robustness checks are carried out in the following Section to ensure that the IR results presented above are not unduly influenced by the presence of extreme values in the data.

5.4 Outliers

Weisberg (1993) points out that a problem with using the mean to summarise numeric data is that it can be strongly affected by extreme values (or outliers) in the data which can draw the mean away towards the extreme case or cases. Thus, if the values of the variables in a data distribution are 2, 5, 8 and 9, the mean would be 6 whilst if the values were 2, 5, 8 and 109 the mean would be drawn towards the latter value and become 31. The presence of outliers in a data distribution skews the distribution and this would be positively skewed if small values predominate but there are some atypical large values. Conversely, the distribution would be negatively skewed if most of the values are large with some atypically small values. Kurtosis, on the other hand, measures the peakedness or flatness of a data distribution. A distribution would be relatively peaked if a few scores around the middle score have a relatively high frequency whilst the distribution would be relatively flat if there are several different scores around the middle score.

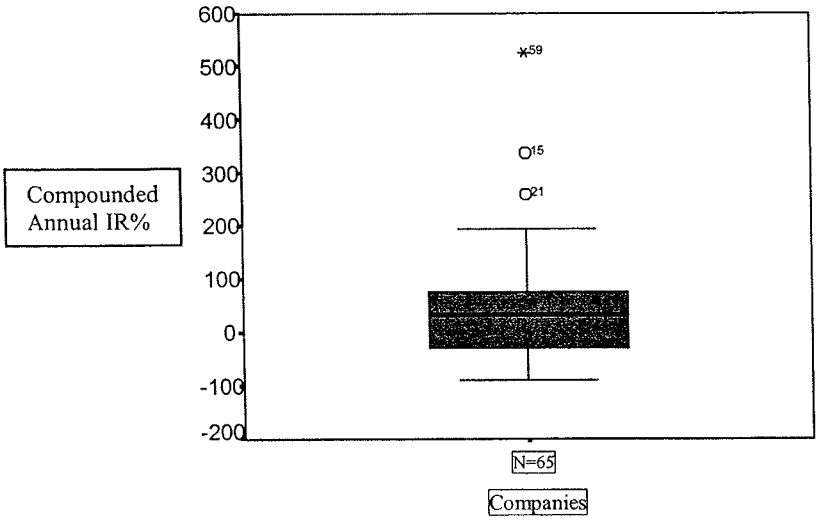
Examination of the data relating to the SIC non-financial companies' 1989 - 1998 compounded annual IR values reveals that, as shown in the histogram in Figure 5.1, the data is highly positively skewed with a skewness value of 19.456 where a value of 0 denotes the absence of skewness. Similarly, the kurtosis value is high at 455.28 where a value of 0 denotes the absence of kurtosis.

Figure 5.1: Histogram of SIC Sample Non-Financial Companies' 1989 - 1998 Compounded Annual IR%



Hair et al (1998) observe that a box plot (or box-and-whisker diagram) is a useful way of examining the characteristics of a data distribution and a typical box-and-whisker diagram produced on SPSS is shown in Figure 5.2. In the diagram, the horizontal line in the box marks the median value of the distribution i.e. the value of the variable corresponding to the middle case whilst the upper and lower edges of the box correspond to the first and third quartiles so that the central 50% of the data values (the inter-quartile range) fall within the range of the box. Data values which fall within 1.5 times the inter-quartile range from the upper or lower edges of the box are connected to the box by straight lines called whiskers. Values which fall between 1.5 and 3 times the inter-quartile range from the upper or lower edges of the box (the 21st and 15th observations in the data distribution in Figure 5.2) are termed outliers and are plotted as circles. Values falling beyond 3 times the inter-quartile range (the 59th observation in Figure 5.2) are termed extreme values and are plotted as stars.

Figure 5.2: Example of Box Plot - Compounded Annual IR%



Outliers may be helpful or problematic in an analysis, the latter being the case if, for example, the outliers are not representative of the population or if their inclusion seriously distorts the results of statistical tests (Hair et al (1998)). The objective of this analysis is to compare the financial performance of the non-financial and match companies and, although extreme share returns occur in the populations of companies represented by the samples of non-financial and match companies, these values are by definition not typical of either group. Furthermore, extreme values can distort the results of paired sample t-tests such as those being carried out in this study since these tests focus on the mean values of the data distributions being analysed. Several approaches towards dealing with extreme values have been suggested such as removing the highest 5% and lowest 5% of the observations in a distribution before computing the mean (the 5% trimmed mean) or reducing the values of the highest 5% and increasing the values of the lowest 5% of the observations before computing the mean (the 5% winsorized mean). Although these measures are *ad hoc* solutions, they are often effective in improving the resistance of the mean to extreme values (Weisberg (1993)).

In order to preserve the underlying characteristics of the data distributions under study without arbitrarily selecting a cut-off point such as 5% of the highest and lowest observations, it was decided to remove only those companies whose compounded annual IR values represented an extreme value in the SIC and SEG samples in the three time periods under study. The extreme values in each data set were identified using box-and-whisker diagrams on SPSS in the manner described above. These outliers were then

removed from the data, it being assured that within each time period an equal number of outliers were removed from the data relating to the sample companies as were removed from the match companies' data. If there were more extreme outliers in the sample companies' data than in the data for the match companies, then a number of "normal" outliers were removed from the match company data (or vice versa) such that the total number of outliers removed from the sample company data and the match company data in a particular time period was the same. When an outlier was removed, its paired sample or match company was also removed.

The total number of outliers which were removed from the SIC and SEG samples are shown in Table 5.6 and vary from 50 in the SIC sample for the 1989 - 1998 period to 2 in the SEG sample for each of the 1989 - 1993 and 1994 - 1998 periods.

TABLE 5.6: OUTLIERS REMOVED FROM IR FULL DATA

PERIOD	SIC Sample				SEG Sample			
	Original Sample	Outliers		Sub-Sample	Original Sample	Outliers		Sub-Sample
		#	%			#	%	
1989 - 1998	716	50	7.0	666	148	8	5.4	140
1989 - 1993	456	28	6.1	428	90	2	2.2	88
1994 - 1998	716	39	5.4	677	148	2	1.8	146

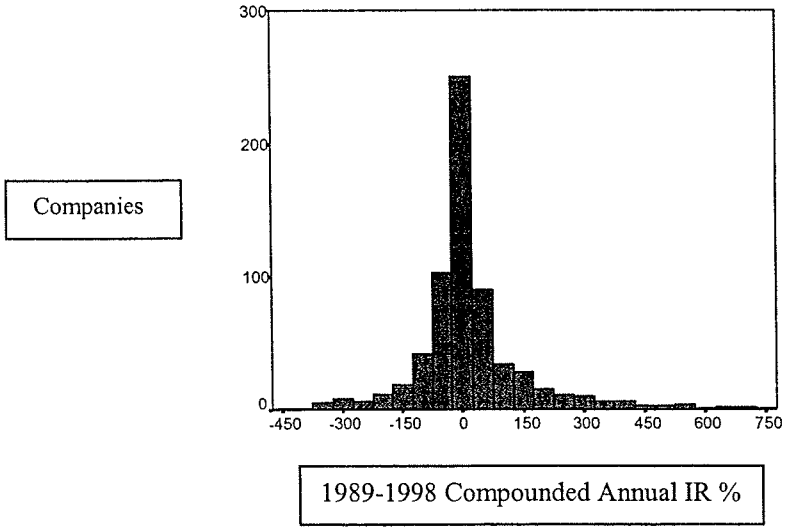
Typical of the outliers removed from the SIC sample's IR data in the 1989 - 1998 period was Harley-Davidson, Inc., a U.S. non-financial company having a compounded annual IR value of 2969.2% over this period compared to the sample mean IR value of 140.2%. In the case of the SEG sample, a typical outlier was Sixt AG (a German company) which was removed from the non-financial companies' 1989 - 1998 and 1994 - 1998 IR data. The company's compounded annual IR values in these periods amounted to 1892.5% and 898.3% respectively compared to the sample mean IR values of 116.0% and 42.6% respectively.

In this study, the paired sample t-test is being utilised, together with the Wilcoxon signed ranks test, to determine whether any statistically significant differences exist between the financial performance of the sample and match companies. As discussed in

Section 3.3, the Wilcoxon signed ranks test is a non-parametric test based on the ranking of the differences between the scores registered by the sample and match companies and is not therefore influenced by outliers. On the other hand, the paired sample t-test calculates the differences between the scores registered by the sample and match companies, obtains the mean of the difference scores and tests whether the latter value is statistically significantly different from the expected score. The test can thus be affected by extreme values since these can have an impact upon the mean of the difference scores.

Since the paired sample t-test focuses on the *differences* between the scores registered by the sample and match companies, it is relevant to consider how the distribution of the data relating to the differences between these companies' compounded annual IR values is affected by the removal of outliers. A histogram of the differences between the SIC samples' non-financial and match companies' 1989 - 1998 compounded annual IR values after removing outliers is presented in Figure 5.3 from which it can be seen that the data approximates a normal distribution more closely than in Figure 5.1 with a skewness value of 1.874 and a kurtosis value of 5.438. Similar patterns were apparent in the other data sets in the SIC and SEG samples.

Figure 5.3: Histogram of Differences between Sample and Match Companies' 1989 - 1998 Compounded Annual IR% in SIC Sample Excluding Outliers



The compounded annual IR results obtained from the SIC sample for each time period before and after removing the outliers are presented in Table 5.7 whilst the results

TABLE 5.7: SIC SAMPLE IR% 1989 - 1998:- FULL DATA SUMMARY ^

SAMPLE	Paired t-Test Full Data						Paired t-Test Excluding Outliers						Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)
1989 - 1998	716	140.19	119.782	20.408	0.619	0.536	666	49.938	30.26	19.678	3.56	0.000 ***	352	364	1.645	0.1 *
1989 - 1993	456	96.9	83.39	13.511	1.185	0.237	428	60.208	52.267	7.941	1.273	0.204	234	222	0.855	0.393
1994 - 1998	716	38.113	18.846	19.268	2.626	0.009 ***	677	9.087	1.249	7.838	2.327	0.02 **	357	359	1.55	0.121

TABLE 5.8: SEG SAMPLE IR% 1989 - 1998:- FULL DATA SUMMARY ^

SAMPLE	Paired t-Test Full Data						Paired t-Test Excluding Outliers						Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)
1989 - 1998	148	115.954	82.51	33.444	1.495	0.137	140	79.465	54.208	25.257	1.634	0.105	81	67	1.122	0.262
1989 - 1993	90	86.27	36.57	49.697	3.257	0.002 ***	88	72.258	31.459	40.798	3.689	0.000 ***	60	30	3.535	0 ***
1994 - 1998	148	42.603	37.897	4.706	0.387	0.7	146	36.216	34.13	2.086	0.194	0.847	71	77	-0.123	0.902

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

^ As discussed in Section 5.3, the data in these Tables are based on incomplete periods of years in the case of some pairs of companies and the data should therefore be interpreted in relative rather than absolute terms.

relating to the SEG sample are presented in Table 5.8. The main effects of removing the outliers upon the differences between the sample and match companies' mean compounded annual IR values may be summarised as follows:

(i) in the SIC sample, after removing 50 outliers (out of a total sample population of 716 companies), the non-financial companies' superior mean IR results in the 1989 - 1998 period become statistically significant in the paired sample t-test at a 1% probability level, corroborating the Wilcoxon signed ranks test which already indicated statistical significance at the 10% level.

The two sub-periods' results are not affected by the removal of the outliers. The non-financial companies' performance continues to be superior to that of the match companies with statistical significance again arising in the 1994 - 1998 period.

(ii) the SEG sample's results are unaffected by the removal of outliers with the non-financial companies' performance continuing to be superior to that of the match companies in all time periods. As previously, the difference between the two group's results is statistically significant in the 1989 - 1993 period in the paired sample t-test at a 1% probability level.

5.5 Discussion on Full Data Results

It is concluded from the analysis presented above that:

1. there is strong evidence to suggest that over the 1989 - 1998 period the financial performance of the non-financial companies, as measured by their compounded annual IR values, was not inferior to that of the match companies. This conclusion holds when outliers are removed from the data. In no instance are the sample companies' results obtained in either the SIC or SEG sample statistically significantly worse than those of the match companies. The non-financial companies do not therefore appear to have suffered any financial disadvantage through their involvement in financial services activities over the period.

2. there is evidence to suggest that the non-financial companies' financial performance during the period was superior to that of the match companies. This evidence is strengthened when outliers are removed from the data.

The evidence leading to these conclusions may be summarised as follows:

1989 - 1998 PERIOD

(i) in both the SIC and SEG samples, the mean of the sample companies' compounded annual IR's is invariably higher than that of the match companies over the 1989 - 1998 period. In the SIC sample the difference is statistically significant in the paired sample t-test (after removing outliers) at a 1% probability level. The performance difference is also statistically significant in the Wilcoxon signed ranks test at a 10% probability level.

(ii) the evidence in (i) is further strengthened by the fact that, in both samples, the average of the sample companies' mean annual IR's over the 1989 - 1998 period is higher than that of the match companies.

SUB-PERIODS

(i) the 1989 - 1993 and 1994 - 1998 five-year periods results reflect those of the ten-year period. In both the SIC and SEG samples, the mean of the sample companies' compounded annual IR's is invariably higher than that of the match companies over both sub-periods. In the SIC sample the performance difference is statistically significant in the 1994 - 1998 period whilst in the SEG sample statistical significance arises in the 1989 - 1993 period.

(ii) in both samples, the average of the sample companies' mean annual IR's is higher than that of the match companies over both sub-periods except that in the SEG sample the match companies marginally outperform the sample companies in the 1994 - 1998 sub-period.

The results obtained from the SIC and SEG samples are remarkably consistent insofar as both samples indicate that the sample companies' financial performance was not inferior to, and in some instances was statistically significantly superior to, that of the match firms. The consistency in the results obtained from the two samples is noteworthy in view of the fact that a different process was used to identify the match companies in the SIC and SEG samples and the match companies chosen in the two samples are thus different. In the SIC sample, market capitalisation and market-to-book ratio data were key factors in the identification of the match companies whilst sales value data was used in the SEG sample. Furthermore, the match companies in the SEG sample are pseudo companies and their results represent a hypothetical amalgamation of the sample companies' activities whereas the match companies' results in the SIC sample are those of existing companies in their entirety. Notwithstanding these factors, the results of the SEG sample corroborate those of the SIC sample.

5.6 Uninterrupted Data Results

As previously noted, the number of years for which IR data were available for the 716 pairs of companies in the SIC sample and the 148 pairs of companies in the SEG sample differed - in the case of some pairs the data were available for the full ten-year period between 1989 - 1998 whilst in the case of other pairs the data were available for a fewer number of years. As a robustness check, an analysis similar to the above was carried out with respect to the compounded annual IR results of those pairs of companies in the SIC and SEG samples for which uninterrupted IR data for the 1989 - 1998, 1989 - 1993 and 1994 - 1998 time periods was available. This analysis also serves to obtain IR data for these time periods with can be compared with other data in absolute terms.

The Uninterrupted IR data results for the 1989 - 1998, 1989 - 1993 and 1994 - 1998 time periods for the SIC and SEG samples are presented in Tables 5.9 and 5.10 both before and after removing outliers. The outliers were identified using the procedures outlined in Section 5.4 above and the number of outliers removed are shown in Table 5.11 below.

TABLE 5.9: SIC SAMPLE IR% 1989 - 1998:- UNINTERRUPTED DATA SUMMARY

SAMPLE	Paired t-Test Uninterrupted Data							W.R.	Paired t-Test Excluding Outliers							W.R.	Wilcoxon signed ranks test				
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)			N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)			SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
1989 - 1998	309	265.377	242.181	23.196	0.313	0.754		1.07	287	131.371	102.034	29.337	2.537	0.012	**	1.15	153	156	1.478	0.139	
1989 - 1993	312	109.667	96.476	13.192	0.854	0.394		1.07	288	63.093	55.925	7.167	0.969	0.334		1.05	157	155	0.413	0.68	
1994 - 1998	488	46.32	28.407	17.913	2.599	0.01	***	1.14	473	29.783	15.238	14.545	3.062	0.002	***	1.13	251	237	2.051	0.04	**

TABLE 5.10: SEG SAMPLE IR% 1989 - 1998:- UNINTERRUPTED DATA SUMMARY

SAMPLE	Paired t-Test Uninterrupted Data							W.R.	Paired t-Test Excluding Outliers							W.R.	Wilcoxon signed ranks test				
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)			N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)			SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
1989 - 1998	65	223.882	140.199	83.683	1.846	0.069	*	1.35	63	194.391	123.25	71.141	1.991	0.051	*	1.32	42	23	1.957	0.05	**
1989 - 1993	65	105.406	39.042	66.365	3.363	0.001	***	1.48	63	86.44	31.977	54.464	4.026	0	***	1.41	47	18	3.754	0	***
1994 - 1998	98	61.727	45.24	16.487	1.072	0.286		1.11	96	52.411	39.664	12.747	0.999	0.32		1.09	46	52	0.579	0.562	

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

W.R. = Wealth Relative

TABLE 5.11: OUTLIERS REMOVED FROM IR UNINTERRUPTED DATA

PERIOD	SIC Sample companies Sample				SEG Sample			
	Original Sample	Outliers		Sub-Sample	Original Sample	Outliers		Sub-Sample
		#	%			#	%	
1989 - 1998	309	22	7.1	287	65	2	3.1	63
1989 - 1993	312	24	7.7	288	65	2	3.1	63
1994 - 1998	488	15	3.1	473	98	2	2.0	96

As can be seen from Tables 5.9 and 5.10, the results of the Uninterrupted data analysis are virtually identical to those of the Full data analysis insofar as in both the SIC and SEG samples the non-financial companies' IR results are always superior to those of the control companies and the statistical significance noted in the previous analysis is confirmed. Furthermore, the conclusions reached in the Full data analysis are further strengthened by the emergence of statistical significance in favour of the non-financial companies in the SEG sample in the 1989 - 1998 period in all the statistical tests carried out. The results of the Uninterrupted data analysis thus confirm and reinforce those of the Full data analysis.

Since the Uninterrupted data results can be interpreted in absolute terms, it is useful to obtain Wealth Relatives with respect to the non-financial and match companies' results. As noted in Section 3.6, a Wealth Relative greater than 1 may be interpreted as the non-financial companies outperforming the match companies and vice versa if the Wealth Relative is less than 1. As can be seen in Tables 5.9 and 5.10, prior to removing outliers the Wealth Relatives stand at 1.07 in the SIC sample and at 1.35 in the SEG sample in the 1989 - 1998 period, the statistics changing to 1.15 and 1.32 respectively after removing outliers.

The Uninterrupted data results are also utilised to make detailed comparisons between the MSCI stock market indices and the non-financial companies' IR results in Section 6.3.3 below.

5.7 Statistical Significance

As noted above, in both the SIC and SEG samples the mean of the sample companies' compounded annual IR's is invariably higher than that of the match companies in the 1989 - 1998, 1989 - 1993 and 1994 - 1998 time periods in both the Full and the Uninterrupted data sets and the difference between the two groups of companies' results is in certain instances statistically significant. In the SIC sample, statistical significance arises in the 1989 - 1998 period (after removing outliers) and in the 1994 - 1998 period. In the SEG sample, statistical significance is evident in the 1989 - 1998 period (in the Uninterrupted data set) and in the 1989 - 1993 period.

It is acknowledged that, whilst the results for the above time periods as a whole are statistically significant, the results of only a few of the years within the respective time periods are significant and the results for the sample period as a whole may thus depend upon a small number of cases in particular sectors/years. As noted in Section 5.3.1, examination of the SIC sample companies' Full data set in Table 5.3 reveals that the sample companies' mean annual IR's are statistically significantly better than those of the match companies in 1991, 1996 and 1997. Similarly, the SEG sample's Full data set results shown in Table 5.4 indicate a statistically significant difference in favour of the sample companies in 1991 and 1995 though the opposite is the case in 1997 with statistical significance emerging in favour of the match companies. Whilst the results of only a few of the years within the respective time periods are thus statistically significant, the following remarks are relevant in this respect:

(i) although the results of only a few years in the above-mentioned data sets are statistically significant, the probability of obtaining these results as a result of random variation is low. Thus, in the SIC sample Full data set results shown in Table 5.3, the results in three of the ten years are statistically significantly in favour of the sample companies at the 10% level. The binomial formula indicates that the probability of obtaining by chance three results out of ten which are statistically significant at the 10% level is only 0.07 which lends support to the conclusion that diversification into financial services created added value for the non-financial companies' shareholders. Furthermore, these results indicate that the effects of diversification into financial services upon the non-financial companies was not limited to one year but occurred in

several years. In the SEG sample Full data set the probability of obtaining by chance two results out of ten which are statistically significant at the 10% level stands at 0.26.

The probability of obtaining the results in the other data sets by chance as calculated by the binomial formula is tabulated in Table 5.12.

TABLE 5.12: STATISTICAL SIGNIFICANCE

A	B	C
DATA SET	NUMBER OF YEARS OUT OF 10 SHOWING STATISTICAL SIGNIFICANCE IN FAVOUR OF SAMPLE COMPANIES	PROBABILITY OF OBTAINING 10% LEVEL OF STATISTICAL SIGNIFICANCE FOR NUMBER OF YEARS SHOWN IN COLUMN B
SIC FULL INCLUDING OUTLIERS	3	0.07
SIC FULL EXCLUDING OUTLIERS	3	0.07
SIC UNINTERRUPTED INCLUDING OUTLIERS	1	0.65
SIC UNINTERRUPTED EXCLUDING OUTLIERS	1	0.65
SEG FULL INCLUDING OUTLIERS	2	0.26
SEG FULL EXCLUDING OUTLIERS	2	0.26
SEG UNINTERRUPTED INCLUDING OUTLIERS	2	0.26
SEG UNINTERRUPTED EXCLUDING OUTLIERS	2	0.26

(ii) although the results of only a few individual years in the various data sets are statistically significant, the results for longer time periods (i.e. five and ten years) are held to be more appropriate indicators of the difference between the sample and match companies' share return performance than the annual results (whether or not the latter indicate a statistically significant result). This is because of (a) the increased power of the statistical tests when they are carried out over several years since they incorporate a larger number of cases as well as the cumulative effect of compounding

the sample and match companies' annual IR's and (b) as discussed in Section 3.6, in this study the compounded annual IR's of companies over relatively long periods of time such as five or ten years are held to be of greater relevance to their shareholders than the IR's over short periods. A similar approach was adopted in several studies such as those by Ritter (1991) and Spiess and Affleck-Graves (1995) which evaluated Holding Period Returns over periods of three and five years and is reflected in Conrad and Kaul's (1993, p.40) comment that "the appropriate measure of performance should be the buy and hold return over long intervals." In the five and ten-year periods examined, the sample companies' IR results were never statistically significantly inferior to those of the control companies whilst the results were statistically significantly superior at the 10% level in 17 (47%) of the 36 statistical tests carried out (see Tables 5.7, 5.8, 5.9 and 5.10). The probability that 47% of the statistical tests carried out would be statistically significant at the 10% level as a result of random variation is extremely low.

(iii) in both the SIC and SEG samples and in both the Full and the Uninterrupted data sets, an exercise was carried out to remove extreme values from the data sets in order to ensure that the results obtained prior to removing these values were not being unduly influenced by a small number of extreme cases. However, the removal of these extreme values had no effect upon the results of the ten and five-year periods and indeed strengthened the statistical significance obtained in these periods.

(iv) a substantial number of statistical tests were carried out on the data collected and several factors could influence the results obtained from the tests. Thus, the results obtained for particular years and in particular sectors may be affected by the time of entry by the non-financial companies into the financial services industry, by the effect of external factors such as the regulatory and economic environment upon the sample companies' financial activities, by the size of the samples collected and by other random variations. Furthermore, a large number of countries were involved in the study and the timing and impact of these factors could vary in the different countries. The design of this study does not however allow the analysis to distinguish between the effects of these factors upon particular years and in particular sectors and countries and the results for longer time periods (i.e. five and ten years) and for the sectors and

countries as a whole are held to be a more reliable indicator of the effects of the factors than the annual results for the reasons noted in (ii) above.

It is however noted that in both the SIC and SEG samples statistical significance only arises in particular (albeit different) sub-periods which may indicate that the non-financial companies' results were affected by fluctuations in economic activity during these periods. Whilst an attempt to understand the factors which may have influenced the sample companies' results in further detail has been made by synthesising the literature review chronologically (see Section 2.4 and (v) below), it is acknowledged that the identification of these factors represents a limitation to this study and that further research is necessary to explain their effect upon the non-financial companies' results.

(v) in Section 2.4, an attempt was made to synthesise the literature review chronologically to determine whether the studies reviewed reveal any pattern of impact that varies with time with respect to the diversification of non-financial companies into the financial services industry. It was concluded from this analysis that during the 1990's an increasing number of non-financial companies diversified into the financial services industry mainly as a result of the deregulation of the industry and the rapid developments in ICT during the period. Whilst the analysis did not reveal any developments which were specifically related to a particular year or years in the 1990's, the fact that an increasing number of non-financial companies considered diversification into the financial services industry to be an attractive strategy is consistent with the finding that this strategy created added value for their shareholders insofar as their compounded annual IR's were higher than those of the match companies over the five and ten-year periods under study with the difference between the two groups of companies' results being statistically significant in certain instances.

5.8 Summary and Conclusions

The review of the overall IR results in this Chapter commenced in Section 5.3 with an analysis of the IR data obtained for the 716 pairs of companies in the SIC sample and the 148 pairs of companies in the SEG sample. Parametric and non-parametric statistical tests were carried out to determine whether any statistically significant differences

existed between the financial performance of the sample and match companies. Robustness tests were then carried out in Sections 5.4 and 5.6 to determine whether the results obtained in Section 5.3 were consistent (a) after removing outliers and (b) when only uninterrupted IR data for the 1989 - 1998, 1989 - 1993 and 1994 - 1998 time periods were analysed. Further parametric and non-parametric statistical tests were carried out and it was concluded that the results of the robustness tests were consistent with the initial results. Finally, the implications of the statistical significance found in certain instances in the differences between the sample and match companies' results was discussed in Section 5.7. It was argued that, although the results of only a few individual years in the various data sets were statistically significant, the results for the five and ten year periods, which in several instances are statistically significant, are more appropriate indicators of the difference between the sample and match companies' share return performance than the annual results for the reasons noted in the Section.

The above analysis thus confirms and reinforces the conclusions reached in Section 5.5 which are restated as follows:

1. There is strong evidence to suggest that over the 1989 - 1998 period the financial performance of the sample companies, as measured by their compounded annual IR values, was not inferior to that of the match companies. This conclusion holds when outliers are removed from the data. In no instance are the sample companies' results obtained in either the SIC or SEG sample statistically significantly worse than those of the match companies. The sample companies do not therefore appear to have suffered any financial disadvantage through their involvement in financial services activities over the period.

2. There is evidence to suggest that the non-financial companies' financial performance during the 1989 - 1998 period was superior to that of the match companies. This evidence is strengthened when outliers are removed from the data and when an Uninterrupted data set is used.

Removing outliers results in the non-financial companies' performance in the SIC sample being statistically significantly superior to the match companies'. Using an uninterrupted data set has a similar effect in the SEG sample. The relevant paired

sample t-test results for the Uninterrupted data set for the 1989 - 1998 period excluding outliers are summarised in Table 5.13.

TABLE 5.13: UNINTERRUPTED DATA 1989 - 1998 IR% RESULTS SUMMARY (EXCLUDING OUTLIERS)

SAMPLE	N	SAMPLE MEAN	MATCH MEAN	DIFFERENCE	t-value	t-prob. (2-tailed)
SIC SAMPLE 1989 - 1998 PERIOD	287	131.4	102.0	29.4	2.537	0.012**
SEG SAMPLE 1989 - 1998 PERIOD	63	194.4	123.3	71.1	1.991	0.051*

* Significant at the 10% level

** Significant at the 5% level

3. The above results are reflected in the sub-period analysis. In both the SIC and SEG samples, the non-financial companies' compounded annual IR's are superior to those of the match companies in both the 1989 - 1993 and 1994 - 1998 sub-periods. Statistical significance emerges in the SEG sample in the former period and in the SIC sample in the latter period.

In the following Chapter, a more detailed analysis of the IR results presented above is carried out to examine the business activities of the sample and match companies in further depth. The IR results are analysed on the basis of the sample companies' financial services activities, their geographic locations, their primary industry and their segmental sales data. Subsequently, the results relating to the accounting ratio data are presented, analysed and discussed in Chapter 7. Finally, in Chapter 8 the conclusions reached from these analyses are synthesised with the theoretical arguments and hypotheses made in previous Chapters.

CHAPTER 6: RESULTS II - INVESTMENT RETURN ANALYSIS BY SIC CODE AND GEOGRAPHIC LOCATION

6.1 Introduction

In the previous Chapter, an analysis of the IR data relating to the SIC and SEG sample and match companies was presented and conclusions put forward based on this analysis. Two of the main conclusions reached were that:

1. There is strong evidence to suggest that over the 1989 - 1998 period the financial performance of the sample companies, as measured by their compounded annual IR values, was not inferior to that of the match companies. This conclusion holds when outliers are removed from the data. In no instance are the sample companies' results obtained in either the SIC or SEG sample statistically significantly worse than those of the match companies. The sample companies do not therefore appear to have suffered any financial disadvantage through their involvement in financial services activities over the period.

2. There is evidence to suggest that the non-financial companies' financial performance during the 1989 - 1998 period was superior to that of the match companies. This evidence is strengthened when outliers are removed from the data.

Further analysis is carried out in this Chapter to determine to what extent the conclusions reached in the previous Chapter are robust with respect to:

(i) the different financial services activities in which the sample companies are engaged.

(ii) the different geographic areas in which the sample and match companies are located.

(iii) the sample companies' different primary industries.

(iv) the degree of diversification by the non-financial companies into financial services activities.

To carry out these analyses the SIC and SEG samples for both the Full and the Uninterrupted data sets were broken down into several sub-samples with a consequent decrease in sample size. The smaller samples reduce the power of the statistical tests carried out and the results presented in this Chapter are thus explorative and suggestive rather than definitive. The analysis is based upon the sample and match companies' Holding Period Returns (or compounded annual returns or IR's where the context is clear) which, as discussed in Chapter 3, are held to be the main gauge of companies' financial performance in this Thesis. The analysis is based mainly on the SIC sample since the size of the SEG sample (N = 148 for the 1989 - 1998 and 1994 - 1998 periods and N = 90 for the 1989 - 1993 period in the Full data set) allows less detailed breakdown of the data.

The compounded annual IR results are analysed on the basis of the sample companies' financial services activities in Section 6.2, their geographic locations in Section 6.3, their primary industry in Section 6.4 and their segmental sales data in Section 6.5. As previously, the IR results are presented both before and after removing outliers. (The outliers removed are those identified in Chapter 5). Finally, a summary of, and conclusions on, the results are presented in Section 6.6.

6.2 Financial Services Activities

The main SIC financial codes in the U.S. SIC classification have been described in Section 4.3 and are detailed in Appendix B. They may be summarised as:

- banking

- providing credit facilities

- broking

- insurance

- rental and leasing

- investment services

The main financial services activity engaged in by the sample companies was taken to be the first financial SIC code in their list of Additional SIC codes and a breakdown of the IR results of the SIC and SEG samples' Full data set in terms of this code for the three time periods including and excluding outliers is presented in Tables 6.1 and 6.2 respectively whilst a breakdown of the IR results relating to the Uninterrupted data set for the two samples is provided in Appendices H and I.

6.2.1 SIC Sample

As can be seen from Table 6.1 in which the IR results for the Full data set are presented, the sample companies engaged in broking, rental and investment services outperformed the match companies over the 1989 - 1998 period and, in the case of broking activities, the difference in performance is statistically significant in the paired sample t-test at a 5% probability level after removing outliers. Although in the case of banking & credit and insurance the match companies outperformed the sample companies, the position is reversed when outliers are removed and the non-financial companies' performance becomes statistically significantly superior to that of the match companies in these financial services activities in the paired sample t-test at the 10% probability level. Thus, after removing outliers, the sample companies' mean IR values are higher than those of the match companies in all financial services activities with the difference in performance being statistically significant in the case of banking & credit, broking and insurance.

The uninterrupted IR data results for the ten-year period shown in Appendix H generally corroborate those of the Full data set outlined above. Prior to removing outliers, the sample companies' results are superior to those of the match companies in all financial services activities except for banking & credit and broking though after removing outliers the non-financial companies outperform the match companies in all

TABLE 6.1: SIC SAMPLE IR% 1989 - 1998:- FULL DATA BY FINANCIAL SIC CODE ^

SAMPLE	Paired t-Test Full Data							Paired t-Test Excluding Outliers							Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
1989 - 1998																			
BANKING & CREDIT	173	139.664	244.24	-104.577	-1.261	0.209		158	85.668	59.069	26.599	1.97	0.051	*	76	97	-0.043	0.966	
BROKING	83	129.168	112.597	16.571	0.31	0.758		76	42.768	11.34	31.428	2.004	0.049	**	42	41	1.344	0.179	
INSURANCE	91	108.075	117.827	-9.752	-0.194	0.847		85	63.236	36.649	26.587	1.723	0.089	*	48	43	1.116	0.264	
RENTAL	261	176.423	78.828	97.595	1.485	0.139		243	36.67	22.432	14.238	1.579	0.116		131	130	0.873	0.383	
INVESTMENT SERVICES	108	88.999	26.556	62.444	1.773	0.079	*	104	21.029	13.39	7.639	0.762	0.448		55	53	0.975	0.33	
TOTAL	716	140.190	119.782	20.408	0.619	0.536		666	49.938	30.26	19.678	3.56	0	***	352	364	1.645	0.1	*
1989 - 1993																			
BANKING & CREDIT	126	94.196	94.465	-0.269	-0.014	0.989		118	72.532	62.625	9.907	0.834	0.406		65	61	0.191	0.848	
BROKING	46	173.834	166.896	6.939	0.181	0.857		41	86.389	69.273	17.116	0.931	0.357		23	23	0.585	0.559	
INSURANCE	74	57.932	50.575	7.358	0.306	0.76		70	31.59	25.564	6.025	0.501	0.618		38	36	0.482	0.63	
RENTAL	158	82.226	51.606	30.62	1.451	0.149		153	48.587	41.476	7.11	0.624	0.534		85	73	0.746	0.456	
INVESTMENT SERVICES	52	135.438	125.956	9.482	0.255	0.799		46	87.463	87.068	0.395	0.019	0.985		23	29	-0.164	0.87	
TOTAL	456	96.9	83.39	13.511	1.185	0.237		428	60.208	52.267	7.941	1.273	0.204		234	222	0.855	0.393	
1994 - 1998																			
BANKING & CREDIT	173	45.477	45.741	-0.264	-0.022	0.209		163	30.301	21.869	8.432	1.027	0.306		79	94	-0.124	0.902	
BROKING	83	27.677	1.258	26.418	1.494	0.139		79	0.83	-9.04	9.871	1.235	0.221		47	36	1.594	0.111	
INSURANCE	91	28.470	19.108	9.362	0.888	0.377		85	2.238	-0.911	3.149	0.411	0.682		45	46	0.653	0.514	
RENTAL	261	36.699	19.754	16.945	1.701	0.09	*	246	8.726	1.829	6.897	1.196	0.233		130	131	0.72	0.471	
INVESTMENT SERVICES	108	45.883	-13.136	59.019	1.75	0.083	*	104	-11.44	-22.856	11.416	1.54	0.127		56	52	1.358	0.175	
TOTAL	716	38.113	18.846	19.268	2.626	0.009	***	677	9.087	1.249	7.838	2.327	0.02	**	357	359	1.55	0.121	

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

^ As discussed in Section 5.3, the data in these Tables are based on incomplete periods of years in the case of some pairs of companies and the data should therefore be interpreted in relative rather than absolute terms.

financial services activities with insurance activities demonstrating statistical significance in the paired sample t-test at a 5% probability level.

The results which emerge from the data for the two five-year periods for the Full data set reflect those of the ten-year period insofar as, both before and after removing outliers, the sample companies' mean IR values are superior to those of the match companies in all financial services activities except in the case of banking & credit where, prior to removing outliers, the IR results are marginally lower. Similar results are apparent in the Uninterrupted data set with statistical significance emerging in the case of rental and investment services in the 1994 - 1998 period.

6.2.2 SEG Sample

As shown in Table 6.2 and Appendix I, small sample sizes are obtained when the SEG sample is broken down into the five financial services activities and thus less reliance can be placed on the results of this analysis than on the results of the SIC sample analysis. It is however of interest to note that the SEG sample results corroborate those of the SIC sample insofar as (a) the non-financial companies' results are never statistically significantly worse than those of the match companies in any financial services activity and (b) the non-financial companies' results are statistically significantly superior to the match companies' in several instances.

Thus, in the Full data set, statistical significance in favour of the sample companies again arises in the banking & credit results in the 1989 - 1998 period at the 5% level in the paired sample t-test after removing outliers. Statistical significance also arises in the 1989 - 1993 period with respect to insurance and rental activities in all the statistical tests carried out at probability levels of 5% and 1% respectively. Statistical significance in these financial services areas, which is confirmed by the Uninterrupted data set, also occurs in the SIC sample, albeit in a different time period. The two samples also differ in other respects with, for example, the sample companies showing poorer results than the match companies in investment services in the 1989 - 1998 period. However, greater credence is placed on the SIC sample results in view of the small sample sizes in the SEG sample - only 18 companies represent investment services in the 1989 - 1998 period in the Full data set and only 4 in the Uninterrupted data set.

TABLE 6.2: SEG SAMPLE IR% 1989 - 1998:- FULL DATA BY FINANCIAL SIC CODE^

SAMPLE	Paired t-Test Full Data							Paired t-Test Excluding Outliers							Wilcoxon signed ranks test				
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
1989 - 1998																			
BANKING & CREDIT	53	132.237	94.77	37.467	1.149	0.256		50	106.458	55.592	50.866	2.012	0.05	**	32	21	1.58	0.114	
BROKING	14	171.989	125.463	46.526	0.563	0.583		13	86.788	103.573	-16.785	-0.293	0.775		4	10	-0.534	0.594	
INSURANCE	13	165.122	142.078	23.044	0.239	0.815		12	164.28	77.979	86.301	1.089	0.299		7	6	0.175	0.861	
RENTAL	50	105.128	39.819	65.309	1.556	0.126		48	54.275	35.343	18.932	0.865	0.391		29	21	0.951	0.342	
INVESTMENT SERVICES	18	18.986	88.567	-69.581	-1.461	0.162		17	5.733	48.872	-43.139	-1.026	0.320		9	9	-0.675	0.5	
TOTAL	148	115.954	82.51	33.444	1.495	0.137		140	79.465	54.208	25.257	1.634	0.105		81	67	1.122	0.262	
1989 - 1993																			
BANKING & CREDIT	38	56.09	31.483	24.607	1.472	0.149		38	56.09	31.483	24.607	1.472	0.149		22	16	1.385	0.166	
BROKING	9	94.334	75.388	18.946	0.511	0.623		9	94.334	75.388	18.946	0.511	0.623		5	4	0.652	0.515	
INSURANCE	10	105.33	12.041	93.289	2.846	0.019	**	10	105.33	12.041	93.289	2.846	0.019	**	9	1	2.293	0.022	**
RENTAL	27	68.851	12.286	56.566	2.947	0.007	***	27	68.851	12.286	56.566	2.947	0.007	***	20	7	2.763	0.006	***
INVESTMENT SERVICES	6	311.928	160.762	151.166	0.871	0.424		4	116.483	110.354	6.129	0.111	0.918		4	2	0.524	0.6	
TOTAL	90	86.27	36.57	49.697	3.257	0.002	***	88	72.258	31.459	40.798	3.689	0.000	***	60	30	3.535	0	***
1994 - 1998																			
BANKING & CREDIT	53	64.627	37.535	27.093	1.445	0.154		53	64.627	37.534	27.093	1.445	0.154		29	24	1.315	0.189	
BROKING	14	38.088	26.727	11.361	0.47	0.646		14	38.088	26.727	11.361	0.47	0.646		6	8	-0.157	0.875	
INSURANCE	13	56.804	82.071	-25.267	-0.531	0.605		13	56.804	82.071	-25.267	-0.531	0.605		5	8	-0.245	0.807	
RENTAL	50	38.629	31.9	6.729	0.289	0.774		49	21.085	30.287	-9.202	-0.532	0.597		24	26	-0.459	0.647	
INVESTMENT SERVICES	18	-17.954	32.401	-50.356	-1.437	0.169		17	-26.037	4.029	-30.066	-0.992	0.336		7	11	-1.198	0.231	
TOTAL	148	42.603	37.897	4.706	0.387	0.7		146	36.216	34.13	2.086	0.194	0.847		71	77	-0.123	0.902	

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

^ As discussed in Section 5.3, the data in these Tables are based on incomplete periods of years in the case of some pairs of companies and the data should therefore be interpreted in relative rather than absolute terms.

Finally, it is relevant to note that the SEG sample match companies' results represent a hypothetical amalgamation of the non-financial companies' activities in the non-financial and financial areas and thus serve as a benchmark of these companies' financial performance in the two areas. The SEG sample results presented in this Section show that the IR results of the non-financial firms were never statistically significantly inferior to those of the match firms but in several instances were statistically significantly superior. This suggests that the financial performance of the non-financial firms in their non-financial activities was at least equivalent to that of companies whose SIC codes did not indicate any involvement in the financial services area whilst their performance in the financial services area was at least equivalent to that of specialist firms in this sector.

6.2.3 Summary and Conclusions

The conclusions reached from the analysis of the IR results of the non-financial companies categorised by the type of financial service activity in which they are engaged may be summarised as follows:

(i) in the SIC sample Full data set, the sample companies' IR results over the 1989 - 1998 period are superior to those of the match companies in the broking, rental and investment areas and, in the case of broking activities, the difference in performance is statistically significant after removing outliers.

In the case of banking & credit and insurance activities, prior to removing outliers the match companies outperform the sample companies though the difference in the performance of the two groups is not statistically significant. The position is reversed when outliers are removed, however, and the non-financial companies' results in these areas become statistically significantly superior to the match companies'.

As was discussed in greater detail in Section 6.2.1, the above results are reflected in the sub-period analysis and are generally corroborated by the Uninterrupted data set analysis.

(ii) the SEG sample's results corroborate those of the SIC sample insofar as statistical significance emerges in banking & credit, insurance and rental activities after removing outliers and/or in certain sub-periods. Although the SEG sample's results conflict with the SIC sample's in some instances, greater credence is placed on the latter sample's results in view of the small sample sizes in the SEG sample.

6.3 Geographic Location

The SIC and SEG sample IR results are next analysed according to the geographic location of the sample and match companies. The geographic groupings consist of North America, Europe, Japan and Others, the latter including companies in Asia (excluding Japan), Australasia, South Africa and South America. The countries included in each geographic grouping are detailed in Appendix C. Within each geographic area, the sample and match companies' results were split according to the type of financial service carried out by the sample companies. To avoid having small sample sizes in the sub-groupings within each geographic area, the sample companies' financial services activities were grouped into two main classes for the purposes of this analysis. Following Barber and Lyon (1997b) who group banking, credit and broking services together as "banking" activities, one group is composed of the non-financial companies whose first financial SIC code falls into these categories. The other group is made up of those non-financial companies whose first financial SIC code relates to insurance, rental and investment services activities.

6.3.1 SIC Sample

An analysis of the SIC sample IR results by geographic location for the Full data set is presented in Table 6.3 whilst a similar breakdown for the Uninterrupted data set is provided in Appendix J. It results from Table 6.3 that in the 1989 - 1998 period, before removing outliers, the sample companies' overall mean IR values are superior to those of the match companies in Europe and Other countries and equivalent to them in North America. The Other countries' results are statistically significant in the paired sample t-test at a 10% probability level. After removing outliers, the North American results become statistically significant in favour of the sample companies in the paired sample t-test at a 1% probability level and this is corroborated by the Wilcoxon signed ranks

TABLE 6.3: SIC SAMPLE IR% 1989 - 1998:- FULL DATA BY GEOGRAPHIC LOCATION ^

SAMPLE	Paired t-Test Full Data						Paired t-Test Excluding Outliers						Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)
1989 - 1998																
NORTH AMERICA	162	351.974	352.597	-0.623	-0.005	0.996	138	129.571	88.91	40.661	3.098	0.002 ***	87	75	1.763	0.078 *
BANKING/CREDIT/BROKING	88	264.01	449.222	-185.212	-1.178	0.242	74	136.442	102.289	34.153	1.997	0.05 **	46	42	0.728	0.467
INSURANCE/RENTAL/INVESTMENT	74	456.58	237.692	218.888	0.982	0.329	64	121.627	73.441	48.186	2.367	0.021 **	41	33	1.802	0.072 *
EUROPE	180	201.553	171.867	29.686	0.654	0.514	161	112.363	91.051	21.312	1.499	0.136	98	82	1.271	0.204
BANKING/CREDIT/BROKING	47	177.431	223.971	-46.54	-0.446	0.658	42	136.727	97.403	39.324	1.316	0.195	27	20	0.783	0.434
INSURANCE/RENTAL/INVESTMENT	133	210.078	153.455	56.623	1.15	0.252	119	103.763	88.809	14.955	0.927	0.356	71	62	1.023	0.306
JAPAN	146	-48.194	-47.980	-0.214	-0.042	0.967	146	-48.194	-47.980	-0.214	-0.042	0.967	63	83	-0.376	0.707
BANKING/CREDIT/BROKING	35	-32.116	-28.322	-3.794	-0.203	0.841	35	-32.116	-28.322	-3.794	-0.203	0.841	11	24	-1.261	0.207
INSURANCE/RENTAL/INVESTMENT	111	-53.264	-54.179	0.915	0.269	0.789	111	-53.264	-54.179	0.915	0.269	0.789	52	59	0.285	0.775
OTHER ASIA/AUSTRALASIA/S.AFRICA/OTHERS	228	61.898	20.666	41.232	1.873	0.062 *	221	19.565	1.040	18.526	1.950	0.052 *	104	124	-0.061	0.951
BANKING/CREDIT/BROKING	86	51.566	29.445	22.121	0.607	0.546	83	24.948	-5.715	30.663	1.65	0.103	34	52	-0.463	0.643
INSURANCE/RENTAL/INVESTMENT	142	68.156	15.349	52.807	1.91	0.058 *	138	16.328	5.102	11.226	1.086	0.279	70	72	0.296	0.767
TOTAL	716	140.19	119.782	20.408	0.619	0.536	666	49.938	30.26	19.678	3.56	0.000 ***	352	364	1.645	0.1 *
BANKING/CREDIT/BROKING	256	136.261	201.559	-65.299	-1.112	0.267	234	71.735	43.567	28.167	2.701	0.007 ***	118	138	0.616	0.538
INSURANCE/RENTAL/INVESTMENT	460	142.376	74.271	68.106	1.726	0.085 *	432	38.132	23.053	15.079	2.364	0.019 **	234	226	1.612	0.107

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

^ As discussed in Section 5.3, the data in these Tables are based on incomplete periods of years in the case of some pairs of companies and the data should therefore be interpreted in relative rather than absolute terms.

TABLE 6.3 (CONTINUED): SIC SAMPLE IR% 1989 - 1998:- FULL DATA BY GEOGRAPHIC LOCATION ^

SAMPLE	Paired t-Test Full Data						Paired t-Test Excluding Outliers						Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)
1989 - 1993																
NORTH AMERICA	103	136.576	123.843	12.733	0.551	0.583	92	89.125	78.438	10.687	0.852	0.397	57	46	1.01	0.312
BANKING/CREDIT/BROKING	62	119.109	142.372	-23.263	-0.843	0.403	55	86.973	87.438	-0.465	-0.033	0.974	32	30	-0.34	0.734
INSURANCE/RENTAL/INVESTMENT	41	162.989	95.824	67.165	1.712	0.095 *	37	92.324	65.06	27.264	1.186	0.243	25	16	2.067	0.039 **
EUROPE	131	81.699	79.700	1.999	0.076	0.940	127	56.558	61.312	-4.754	-0.375	0.708	62	69	-1.064	0.288
BANKING/CREDIT/BROKING	38	42.151	79.646	-37.495	-1.026	0.311	37	43.951	51.335	-7.384	-0.347	0.73	19	19	-0.457	0.648
INSURANCE/RENTAL/INVESTMENT	93	97.858	79.721	18.137	0.534	0.595	90	61.741	65.414	-3.673	-0.234	0.815	43	50	-0.944	0.345
JAPAN	123	-20.578	-17.643	-2.935	-0.46	0.647	123	-20.578	-17.643	-2.934	-0.460	0.647	60	63	-0.255	0.799
BANKING/CREDIT/BROKING	33	-16.917	-10.808	-6.109	-0.49	0.627	33	-16.917	-10.808	-6.109	-0.49	0.627	12	21	-1.313	0.189
INSURANCE/RENTAL/INVESTMENT	90	-21.92	-20.149	-1.77	-0.237	0.813	90	-21.92	-20.15	-1.771	-0.237	0.813	48	42	0.65	0.516
OTHER ASIA/AUSTRALASIA/S.AFRICA/OTHERS	99	221.694	171.711	49.983	1.666	0.099 *	86	150.206	110.902	39.304	2.132	0.036 **	55	44	1.86	0.063 *
BANKING/CREDIT/BROKING	39	293.252	207.251	86.001	1.702	0.097 *	34	183.802	114.061	69.741	2.345	0.025 **	25	14	2.051	0.04 **
INSURANCE/RENTAL/INVESTMENT	60	175.182	148.61	26.572	0.716	0.477	52	128.24	108.837	19.404	0.832	0.409	30	30	0.714	0.475
TOTAL	456	96.9	83.39	13.511	1.185	0.237	428	60.208	52.267	7.941	1.273	0.204	234	222	0.855	0.393
BANKING/CREDIT/BROKING	172	115.495	113.836	1.659	0.094	0.925	159	76.105	64.339	11.766	1.179	0.24	88	84	0.463	0.643
INSURANCE/RENTAL/INVESTMENT	284	85.639	64.951	20.688	1.388	0.166	269	50.812	45.132	5.68	0.711	0.478	146	138	0.729	0.466
1994 - 1998																
NORTH AMERICA	162	87.150	81.646	5.503	0.412	0.681	142	46.801	37.842	8.959	1.071	0.286	87	75	1.004	0.315
BANKING/CREDIT/BROKING	88	87.452	83.109	4.343	0.272	0.786	78	63.846	46.778	17.068	1.467	0.147	46	42	0.429	0.668
INSURANCE/RENTAL/INVESTMENT	74	86.789	79.907	6.883	0.308	0.759	64	26.027	26.952	-0.924	-0.077	0.939	41	33	1.048	0.295
EUROPE	180	101.308	65.654	35.654	2.333	0.021 **	167	74.226	45.542	28.683	3.259	0.001 ***	104	76	2.428	0.015 **
BANKING/CREDIT/BROKING	47	130.033	93.399	36.634	0.91	0.368	44	99.349	66.268	33.081	1.704	0.096 *	28	19	1.778	0.075 *
INSURANCE/RENTAL/INVESTMENT	133	91.156	55.849	35.308	2.334	0.021 **	123	65.238	38.128	27.11	2.774	0.006 ***	76	57	1.76	0.078 *
JAPAN	146	-37.780	-36.813	-0.968	-0.205	0.838	146	-37.780	-36.813	-0.968	-0.205	0.838	65	81	-0.032	0.974
BANKING/CREDIT/BROKING	35	-26.133	-16.077	-10.057	-0.658	0.515	35	-26.133	-16.077	-10.057	-0.658	0.515	16	19	-0.311	0.756
INSURANCE/RENTAL/INVESTMENT	111	-41.453	-43.351	1.898	0.483	0.63	111	-41.453	-43.351	1.898	0.483	0.63	49	62	0.135	0.892
OTHER ASIA/AUSTRALASIA/S.AFRICA/OTHERS	228	1.98	-27.089	29.069	1.722	0.086 *	222	-33.215	-30.445	-2.770	-0.595	0.552	101	127	-0.772	0.44
BANKING/CREDIT/BROKING	86	-31.722	-36.315	4.593	0.448	0.655	85	-40.377	-37.075	-3.303	-0.5	0.619	36	50	-0.962	0.336
INSURANCE/RENTAL/INVESTMENT	142	22.391	-21.501	43.893	1.666	0.098 *	137	-28.771	-26.331	-2.44	-0.385	0.701	65	77	-0.213	0.831
TOTAL	716	38.113	18.846	19.268	2.626	0.009 ***	677	9.087	1.249	7.838	2.327	0.02 **	357	359	1.55	0.121
BANKING/CREDIT/BROKING	256	39.706	31.319	8.387	0.837	0.403	242	20.68	11.779	8.902	1.458	0.146	126	130	0.661	0.509
INSURANCE/RENTAL/INVESTMENT	460	37.227	11.904	25.323	2.542	0.011 **	435	2.637	-4.608	7.246	1.812	0.071 *	231	229	1.448	0.148

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

^ As discussed in Section 5.3, the data in these Tables are based on incomplete periods of years in the case of some pairs of companies and the data should therefore be interpreted in relative rather absolute terms.

test at a 10% probability level. It is of interest to note that, reflecting the economic conditions prevailing in that country, the Japanese sample companies' and match companies' mean IR values are both negative. Furthermore, the sample companies' results are marginally inferior to the match companies' though the difference between the two groups' results is not statistically significant.

Analysis of the uninterrupted IR data for the ten-year period shown in Appendix J corroborates the conclusions reached above except that, whilst the North American non-financial companies' overall IR results are superior to those of the match companies both before and after removing outliers, the difference in performance is not statistically significant.

Analysis of the Full data set ten-year results by the two financial services sub-groupings generally follows the patterns noted in Section 6.2. Whilst, prior to removing outliers, the sample companies' mean IR values are higher than the match companies' in the insurance, rental and investment areas in all regions, the match companies outperform the sample companies in the banking, credit and broking group in all geographic areas except Other countries. However, after removing outliers, the sample companies' results are superior to those of the match companies in all geographic areas and in all financial services activities except in the case of banking, credit and broking in Japan. The North American results become statistically significant in the banking, credit and broking group and also in the insurance, rental and investment group in the paired sample t-test at a 5% probability level.

The uninterrupted IR data results for the financial services sub-groupings for the ten-year period shown in Appendix J corroborate the conclusions reached above except that, as previously noted, statistical significance is not demonstrated in the North American non-financial companies' IR results. Furthermore, prior to removing outliers, the non-financial companies' IR results in the banking, credit and broking area are also inferior to those of the match companies in the Other countries.

The results for two sub-periods for the Full data set shown in Table 6.3 reflect those of the 1989 - 1998 period with the sample companies' overall mean IR values, prior to removing outliers, being superior to those of the match companies in all geographic

areas except Japan where they are marginally lower. Statistical significance in favour of the sample companies emerges in Other countries in both sub-periods and in Europe in the 1994 - 1998 period. The position does not change materially after removing outliers, with the sample companies' results being superior than, or equivalent to, those of the match companies. These results are generally corroborated by the results of the Uninterrupted data set shown in Appendix J.

As noted above, the sample and match companies mean IR results in Japan are always negative which reflects the economic conditions prevailing in that country. Furthermore, the sample companies' results are generally marginally inferior to the match companies' though the difference between the two groups' results is never statistically significant. Since the Japanese companies form a substantial part (20.4%) of the SIC sample, an analysis was carried out to assess the impact of these companies' results upon the SIC sample's overall results. The results of this analysis for the 1989 - 1998 period for the

TABLE 6.4: SIC SAMPLE IR% 1989 - 1998: FULL DATA SUMMARY EXCLUDING JAPAN

SAMPLE	N	PAIRED SAMPLE T-TEST						WILCOXON SIGNED RANKS TEST	
		SAMPLE MEAN	MATCH MEAN	DIFFERENCE	t-value	t-prob (2-tailed)		z-value	z-prob (2-tailed)
INCLUDING JAPAN	716	140.19	119.782	20.408	0.619	0.536		1.645	0.1*
EXCLUDING JAPAN	570	188.443	162.752	25.691	0.62	0.535		2.013	0.044**

TABLE 6.5: SIC SAMPLE IR% 1989 - 1998: FULL DATA SUMMARY EXCLUDING JAPAN AND OUTLIERS

SAMPLE	N	PAIRED SAMPLE T-TEST				
		SAMPLE MEAN	MATCH MEAN	DIFFERENCE	t-value	t-prob (2-tailed)
INCLUDING JAPAN	666	49.938	30.26	19.678	3.56	0.000***
EXCLUDING JAPAN	520	77.491	52.228	25.263	3.654	0.000***

* Significant at the 10% level

** Significant at the 5% level

*** Significant at the 1% level

Full data set are presented in Tables 6.4 and 6.5 and indicate that, whilst the exclusion of the Japanese companies substantially increases the sample and match companies' mean IR values, the impact upon the t-values in the paired sample t-tests is not material.

6.3.2 SEG Sample

The SEG sample's IR results shown in Table 6.6 and Appendix K generally corroborate those of the SIC sample. The sample companies' mean IR values are superior to those of the match companies in North America with the difference in the two group's results being statistically significant in the 1989 - 1998 period in both the Full data set and the Uninterrupted data set after removing outliers, as well as in the 1989 - 1993 period in the latter data set. In Europe also, the sample companies' mean IR values are superior to those of the match companies and the difference in the two group's results is statistically significant in the 1989 - 1993 period in both data sets. As in the SIC sample, the Japanese companies' mean IR values are always negative. In contrast to the SIC sample's results, the match companies' mean IR values are superior to the sample companies' in the Other countries in several instances but in view of the small sample size of the SEG sample, with only 33 companies representing the Other countries in the Full data set, greater credence is placed on the SIC sample's results.

6.3.3 MSCI Indices

It is of interest to compare the MSCI indices discussed in Section 5.2.2 with the non-financial companies' compounded annual IR results obtained from the Uninterrupted data set. As may be seen from Table 6.7, in the 1989 - 1998 period the non-financial companies' mean IR values were superior to the percentage movements in the respective MSCI World, North America and Europe indices. On the other hand, the Japanese non-financial companies' mean IR values were comparable to the MSCI index movement in absolute terms and, like the index, denote negative share returns. The non-financial companies' mean IR value in the Other countries is relatively high at 197.6% and reflects the inclusion in this sample of countries such as Hong Kong and Singapore where the mean IR values over the period stood at 250.3% and 82.7% respectively. (These results compare to movements in the MSCI index of 213.7% and 54.7% respectively). Since Hong Kong and Singapore constitute 38.5% of the Other countries'

TABLE 6.6: SEG SAMPLE IR% 1989 - 1998:- FULL DATA BY GEOGRAPHIC LOCATION ^

SAMPLE	Paired t-Test Full Data							Paired t-Test Excluding Outliers							Wilcoxon signed ranks test				
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
1989 - 1998																			
NORTH AMERICA	44	253.787	171.83	81.957	1.606	0.116		38	191.248	101.128	90.12	2.427	0.02	**	25	19	1.61	0.107	
EUROPE	49	159.250	111.093	48.157	1.060	0.294		47	120.563	96.571	23.991	0.881	0.383		29	20	0.85	0.395	
JAPAN	22	-39.092	-43.080	3.988	0.201	0.843		22	-39.092	-43.080	3.988	0.201	0.843		12	10	0.114	0.91	
OTHER ASIA/AUSTRALASIA/S.AFRICA	33	-28.749	4.701	-33.449	-1.355	0.185		33	-28.749	4.701	-33.449	-1.355	0.185		15	18	-0.902	0.367	
TOTAL	148	115.954	82.51	33.444	1.495	0.137		140	79.465	54.208	25.257	1.634	0.105		81	67	1.122	0.262	
1989 - 1993																			
NORTH AMERICA	26	109.216	54.102	55.114	1.943	0.063	*	26	109.216	54.102	55.114	1.943	0.063	*	18	8	1.918	0.055	*
EUROPE	33	75.029	36.257	38.772	2.504	0.018	**	33	75.029	36.257	38.772	2.504	0.018	**	23	10	2.439	0.015	**
JAPAN	19	-12.717	-31.039	18.321	1.121	0.277		19	-12.717	-31.039	18.321	1.121	0.277		11	8	0.926	0.355	
OTHER ASIA/AUSTRALASIA/S.AFRICA	12	224.194	106.513	117.681	1.411	0.186		10	128.470	75.500	52.970	2.198	0.056	*	8	4	1.569	0.117	
TOTAL	90	86.27	36.57	49.697	3.257	0.002	***	88	72.258	31.459	40.798	3.689	0.000	***	60	30	3.535	0	***
1994 - 1998																			
NORTH AMERICA	44	113.67	85.689	27.98	1.147	0.258		44	113.67	85.69	27.981	1.147	0.258		22	22	0.934	0.351	
EUROPE	49	79.190	62.185	17.005	0.682	0.498		47	60.906	51.518	9.388	0.523	0.603		27	22	0.661	0.508	
JAPAN	22	-27.748	-29.209	1.461	0.079	0.938		22	-27.748	-29.209	1.461	0.079	0.938		9	13	-0.633	0.527	
OTHER ASIA/AUSTRALASIA/S.AFRICA	33	-59.578	-17.154	-42.424	-2.253	0.031	**	33	-59.578	-17.154	-42.424	-2.253	0.031	**	13	20	-2.207	0.027	**
TOTAL	148	42.603	37.897	4.706	0.387	0.7		146	36.216	34.13	2.086	0.194	0.847		71	77	-0.123	0.902	

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

^ As discussed in Section 5.3, the data in these Tables are based on incomplete periods of years in the case of some pairs of companies and the data should therefore be interpreted in relative rather than absolute terms.

TABLE 6.7: SIC SAMPLE NON-FINANCIAL COMPANIES' UNINTERRUPTED DATA IR% AND MSCI INDEX

SAMPLE	NON-FINANCIAL COMPANIES (INCLUDING OUTLIERS)			MSCI INDEX
	N	% OF SAMPLE	IR%	% CHANGE
1989 - 1998				
WORLD	309	100.0%	265.4	132.6
NORTH AMERICA	85	27.5%	582.1	339.6
EUROPE	89	28.8%	287.2	227.6
JAPAN	83	26.9%	-39.8	-45.6
OTHER ASIA/AUSTRALASIA/S.AFRICA	52	16.8%	197.6	N/A
HONG KONG	9	2.9%	250.3	213.7
SINGAPORE	11	3.6%	82.7	54.7
1989 - 1993				
WORLD	312	100.0%	109.7	21.1
NORTH AMERICA	85	27.2%	134.5	64.8
EUROPE	92	29.5%	101.0	51
JAPAN	83	26.6%	-19.0	-32.3
OTHER ASIA/AUSTRALASIA/S.AFRICA	52	16.7%	289.5	N/A
HONG KONG	9	2.9%	318.7	309.2
SINGAPORE	11	3.5%	201.2	158.4
1994 - 1998				
WORLD	488	100.0%	46.3	92.1
NORTH AMERICA	121	24.8%	108.1	166.8
EUROPE	135	27.7%	111.7	116.9
JAPAN	128	26.2%	-37.9	-19.8
OTHER ASIA/AUSTRALASIA/S.AFRICA	104	21.3%	-6.9	N/A
HONG KONG	23	4.7%	-37.7	-23.3
SINGAPORE	17	3.5%	-49.5	-40.1

sample, these two countries' results have a substantial effect on the Other countries' overall mean IR value.

The trends noted above are reflected in the 1989 - 1993 period when the non-financial companies' mean IR values surpassed the MSCI World, North America and Europe indices' percentage movement. In Japan, the non-financial companies' mean IR values were comparable with the index, both in absolute terms and in terms of denoting negative share returns. In the Other countries, the non-financial companies' mean IR value is again relatively high at 289.5%, once more reflecting the inclusion of countries such as Hong Kong and Singapore in this sample where the mean IR values over the period stood at 318.7% and 201.2% respectively. (These results compare with movements in the MSCI indices of 309.2% and 158.4% respectively). In the 1994 - 1998 period, whilst the non-financial companies' mean IR value in Europe is in line with the MSCI index, the global mean IR value and the mean IR value in North America are both lower than those registered by the respective MSCI indices. The Japanese companies' results are similar to those noted in the other periods whilst the Other countries' overall mean IR value of -6.9% is again materially affected by the results of countries such as Hong Kong and Singapore where the mean IR values over the period stood at -37.7% and -49.5% respectively. (These results compare with movements in the MSCI indices of -23.3% and -40.1% respectively).

As noted above, whilst the non-financial companies' global mean IR values, as well as their mean IR values in North America, surpassed the respective MSCI indices in the 1989 - 1998 and 1989 - 1993 periods, this was not the case in the 1994 - 1998 period when the two mean IR values were lower than the MSCI indices with the differences between the mean IR values and the MSCI indices standing at -45.8% and -58.7% respectively. In the case of the global mean IR values, it should be noted that the non-financial companies' global mean IR results are not strictly comparable with the MSCI World index due to differences in the weightings given to the various countries' results in the two statistics. Furthermore, fewer countries are represented in the SIC sample than in the MSCI World index. Thus, for example, the negative results registered in Japan, Hong Kong and Singapore in the 1994 - 1998 period have a disproportionately negative effect upon the non-financial companies' global mean IR values in this period given that these countries constitute 34.4% of the SIC sample compared to 24.8% in the

case of North America. The above observations also suggest that the economic and business conditions prevailing in the earlier part of the 1990's in North America influenced the non-financial companies' share returns more favourably than those of the companies forming part of the MSCI indices though the opposite was the case in the second part of the 1990's. However, when the two sub-periods are taken as a whole, the non-financial companies' mean IR values surpass the movements in the index. Further investigation is necessary to determine the underlying economic and business factors which may have caused these variations in the sub-periods to occur in North America but this is beyond the scope of the present study.

6.3.4 Summary and Conclusions

The conclusions reached from the analysis of the compounded annual IR results of the non-financial companies categorised by their geographic location may be summarised as follows:

(i) differences in the sample companies' financial performance emerge when the companies are grouped according to their geographic location. The sample companies' overall financial performance in the SIC sample Full data set over the ten-year period is superior to those of the match companies in Europe and Other countries and equivalent to them in North America, with statistical significance being demonstrated in the Other countries' results. After removing outliers, the North American results also become statistically significant in favour of the sample companies. The sample companies' financial performance in Japan is marginally inferior to that of the match companies. However, an analysis of the impact of the latter companies' results upon the SIC sample's overall results indicates that the effect is not material.

(ii) confirming the results obtained in Section 6.2, differences are also apparent in the sample companies' results within the financial services sub-groupings in the different countries. In the insurance, rental and investment areas, the sample companies' results are superior to those of the match companies in all geographic areas. In the case of banking, credit and broking, prior to removing outliers the sample companies' results are inferior to the match companies' in North America, Europe and

Japan but the position in the former two geographic areas is reversed when outliers are removed and the sample companies' results become superior to those of the match companies, with statistical significance being demonstrated in the North American results.

As discussed in greater detail in Section 6.3.1, the results of the Uninterrupted data set generally corroborate those of the Full data set described above.

6.4 Primary Industry

In this Section, the results obtained in Section 6.2 are analysed according to the sample companies' primary industry. The sample companies were divided into six groups on the basis of their Primary US SIC code classification, the groups being made up as follows:

- Group 1 covers companies involved in primary activities such as agriculture and mining (SIC Codes 01 to 17). These are referred to as the 'primary sector' in the discussion below.

- Group 2 consists of companies engaged in manufacturing activities (SIC Codes 20 to 39).

- Group 3 includes companies involved in transportation activities (SIC Codes 40 to 47).

- Group 4 is made up of companies involved in communications activities (SIC Code 48) and electric, gas and sanitary services (SIC Code 49).

- Group 5 covers wholesale and retail activities (SIC Codes 50 to 59).

- Group 6 comprises service activities (SIC Codes 65, 70 to 79 and 87).

6.4.1 SIC Sample

An analysis of the SIC sample IR results by primary industry for the Full data set is presented in Table 6.8 whilst a similar breakdown for the Uninterrupted data set is provided in Appendix L. It results from Table 6.8 that in the 1989 - 1998 period, before removing outliers, the sample companies' overall mean IR values are superior to those of the match companies in all industries except for transport. The primary sector's (agriculture, mining etc.) overall IR results are statistically significant in the paired sample t-test at a 5% probability level. After removing outliers, the manufacturing, communications and services overall IR results also become statistically significant in favour of the sample companies in the paired sample t-test.

Analysis of the uninterrupted IR data for the ten-year period shown in Appendix L corroborates the conclusions reached above except that, whilst the manufacturing and communications non-financial companies' overall IR results remain superior to those of the match companies, the difference in performance is not statistically significant.

Analysis of the Full data set ten-year results by the financial services sub-groupings indicate that, prior to removing outliers, the sample companies' mean IR values are higher than the match companies' in the insurance, rental and investment areas in all industries except transport. The sample companies also outperform the match companies in the banking, credit and broking group in all industries except manufacturing and services. However, after removing outliers, the sample companies' results are superior to those of the match companies in all industries and in all financial services activities except in the case of insurance, rental and investment in the transport sector. Both before and after removing outliers, statistical significance is demonstrated in the banking, credit and broking group in the primary sector and in the insurance, rental and investment group in the services sector.

The uninterrupted IR data results for the financial services sub-groupings for the ten-year period shown in Appendix L generally corroborate the conclusions reached above with respect to insurance, rental and investment activities. However, in the banking, credit and broking area the sample companies' results before removing outliers are inferior to the match companies' in all industries except for the primary sector where the

TABLE 6.8: SIC SAMPLE IR% 1989 - 1998:- FULL DATA BY PRIMARY SIC CODE ^

SAMPLE	Paired t-Test Full Data							Paired t-Test Excluding Outliers							Wilcoxon signed ranks test				
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
1989 - 1998																			
AGRICULTURE, MINING ETC.	92	76.295	40.098	36.198	2.382	0.019	**	89	55.185	18.438	36.747	2.394	0.019	**	45	47	1.266	0.206	
BANKING/CREDIT/BROKING	37	138.884	70.06	68.824	2.416	0.021	**	35	111.927	36.129	75.798	2.623	0.013	**	21	16	2.029	0.042	**
INSURANCE/RENTAL/INVESTMENT	55	34.191	19.94	14.249	0.875	0.385		54	18.407	6.971	11.436	0.7	0.487		24	31	-0.302	0.763	
MANUFACTURING	212	221.927	206.938	14.989	0.146	0.884		194	62.175	40.702	21.473	1.938	0.054	*	100	112	0.243	0.808	
BANKING/CREDIT/BROKING	94	158.544	306.505	-147.961	-1.012	0.314		84	71.532	47.363	24.169	1.431	0.156		39	55	-0.485	0.628	
INSURANCE/RENTAL/INVESTMENT	118	272.419	127.623	144.796	1.017	0.311		110	55.029	35.615	19.414	1.317	0.191		61	57	0.775	0.438	
TRANSPORT	69	80.0	91.733	-11.746	-0.18	0.858		64	13.825	6.24	7.585	0.419	0.676		37	32	0.625	0.532	
BANKING/CREDIT/BROKING	8	109.634	6.057	103.577	0.971	0.364		8	109.634	6.057	103.577	0.971	0.364		5	3	0.7	0.484	
INSURANCE/RENTAL/INVESTMENT	61	76.099	102.969	-26.87	-0.371	0.712		56	0.138	6.266	-6.128	-0.44	0.661		32	29	0.42	0.674	
COMMUNICATIONS	42	141.159	124.563	16.595	0.496	0.623		39	131.545	77.348	54.196	1.977	0.055	*	22	20	0.656	0.512	
BANKING/CREDIT/BROKING	12	175.762	164.136	11.626	0.259	0.8		11	154.735	111.539	43.195	1.237	0.244		6	6	0.314	0.754	
INSURANCE/RENTAL/INVESTMENT	30	127.317	108.734	18.583	0.425	0.674		28	122.434	63.916	58.518	1.627	0.115		16	14	0.648	0.517	
WHOLESALE & RETAIL	154	67.117	47.712	19.405	1.056	0.293		148	29.797	28.306	1.49	0.136	0.892		72	82	-0.446	0.655	
BANKING/CREDIT/BROKING	51	84.599	67.235	17.363	0.439	0.662		48	47.019	42.926	4.094	0.173	0.864		25	26	0.131	0.896	
INSURANCE/RENTAL/INVESTMENT	103	58.46	38.045	20.416	1.049	0.296		100	21.53	21.289	0.241	0.021	0.983		47	56	-0.691	0.49	
SERVICES	147	166.832	131.258	35.575	0.714	0.476		132	44.397	22.812	21.586	2.047	0.043	**	76	71	1.957	0.05	**
BANKING/CREDIT/BROKING	54	139.632	273.119	-133.487	-1.306	0.197		48	42.16	33.665	8.495	0.472	0.639		22	32	-0.4	0.689	
INSURANCE/RENTAL/INVESTMENT	93	182.627	48.887	133.74	2.705	0.008	***	84	45.676	16.61	29.066	2.237	0.028	***	54	39	2.703	0.007	***
TOTAL	716	140.19	119.782	20.408	0.619	0.536		666	49.938	30.26	19.678	3.56	0.000	***	352	364	1.645	0.1	*
BANKING/CREDIT/BROKING	256	136.261	201.559	-65.299	-1.112	0.267		234	71.735	43.567	28.167	2.701	0.007	***	118	138	0.616	0.538	
INSURANCE/RENTAL/INVESTMENT	460	142.376	74.271	68.106	1.726	0.085	*	432	38.132	23.053	15.079	2.364	0.019	**	234	226	1.612	0.107	

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

^ As discussed in Section 5.3, the data in these Tables are based on incomplete periods of years in the case of some pairs of companies and the data should therefore be interpreted in relative rather than absolute terms.

TABLE 6.8 (CONTINU' SIC SAMPLE IR% 1989 - 1998:- FULL DATA BY PRIMARY SIC CODE ^

SAMPLE	Paired t-Test Full Data						Paired t-Test Excluding Outliers						Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)
1989 - 1993																
AGRICULTURE, MINING ETC.	60	107.169	63.749	43.419	2.025	0.047 **	57	91.963	41.512	50.45	2.677	0.1 *	37	23	2.164	0.03 **
BANKING/CREDIT/BROKING	26	135.523	79.041	56.481	2.021	0.054 *	25	123.829	58.865	64.965	2.343	0.028 **	18	8	2.07	0.038 **
INSURANCE/RENTAL/INVESTMENT	34	85.486	52.055	33.431	1.062	0.296	32	67.067	27.956	39.111	1.513	0.14	19	15	0.932	0.351
MANUFACTURING	145	105.521	89.599	15.922	0.657	0.512	135	61.706	57.011	4.695	0.391	0.696	74	71	0.625	0.532
BANKING/CREDIT/BROKING	69	76.09	108.846	-32.756	-1.226	0.224	64	60.783	56.04	4.743	0.294	0.77	32	37	-0.493	0.622
INSURANCE/RENTAL/INVESTMENT	76	132.241	72.124	60.117	1.547	0.126	71	62.538	57.887	4.652	0.263	0.793	42	34	1.294	0.196
TRANSPORT	44	34.241	55.674	-21.434	-0.642	0.524	43	31.289	22.871	8.418	0.550	0.585	20	24	0.035	0.972
BANKING/CREDIT/BROKING	4	123.2	63.209	59.991	1.307	0.282	4	123.199	63.209	59.991	1.307	0.282	3	1	1.095	0.273
INSURANCE/RENTAL/INVESTMENT	40	25.345	54.92	-29.576	-0.815	0.42	39	21.863	18.734	3.129	0.194	0.847	17	23	-0.403	0.687
COMMUNICATIONS	33	89.229	70.398	18.831	0.620	0.539	32	66.209	68.271	-2.063	-0.091	0.928	19	14	0.92	0.357
BANKING/CREDIT/BROKING	10	153.362	80.43	72.932	1.036	0.327	9	78.639	73.985	4.655	0.243	0.814	5	5	0.663	0.508
INSURANCE/RENTAL/INVESTMENT	23	61.345	66.036	-4.691	-0.151	0.881	23	61.345	66.036	-4.691	-0.151	0.881	14	9	0.76	0.447
WHOLESALE & RETAIL	93	68.382	50.147	18.235	0.988	0.326	90	50.661	44.645	6.016	0.470	0.640	49	44	0.067	0.947
BANKING/CREDIT/BROKING	32	86.026	55.329	30.697	1.067	0.294	31	68.481	54.292	14.189	0.583	0.564	19	13	0.711	0.477
INSURANCE/RENTAL/INVESTMENT	61	59.127	47.429	11.698	0.49	0.626	59	41.297	39.576	1.721	0.115	0.909	30	31	-0.492	0.623
SERVICES	81	143.768	145.34	-1.572	-0.048	0.962	71	58.777	72.134	-13.356	-0.953	0.344	35	46	-1.236	0.216
BANKING/CREDIT/BROKING	31	203.614	231.827	-28.214	-0.45	0.656	26	68.898	98.844	-29.947	-1.503	0.145	11	20	-1.529	0.126
INSURANCE/RENTAL/INVESTMENT	50	106.664	91.718	14.946	0.41	0.684	45	52.93	56.701	-3.771	-0.2	0.843	24	26	-0.362	0.717
TOTAL	456	96.9	83.39	13.511	1.185	0.237	428	60.208	52.267	7.941	1.273	0.204	234	222	0.855	0.393
BANKING/CREDIT/BROKING	172	115.495	113.836	1.659	0.094	0.925	159	76.105	64.339	11.766	1.179	0.24	88	84	0.463	0.643
INSURANCE/RENTAL/INVESTMENT	284	85.639	64.951	20.688	1.388	0.166	269	50.812	45.132	5.68	0.711	0.478	146	138	0.729	0.466
1994 - 1998																
AGRICULTURE, MINING ETC.	92	14.148	-2.816	16.965	1.538	0.128	91	9.512	-2.327	11.839	1.199	0.234	38	54	-0.171	0.864
BANKING/CREDIT/BROKING	37	24.497	2.544	21.953	1.334	0.191	37	24.497	2.544	21.953	1.334	0.191	17	20	0.671	0.502
INSURANCE/RENTAL/INVESTMENT	55	7.186	-6.423	13.609	0.916	0.364	54	-0.755	-5.664	4.908	0.4	0.691	21	34	-0.737	0.461
MANUFACTURING	212	39.03	40.875	-1.845	-0.177	0.86	197	14.301	10.764	3.536	0.568	0.571	104	108	0.009	0.993
BANKING/CREDIT/BROKING	94	46.832	47.655	-0.823	-0.062	0.951	88	29.457	21.905	7.551	0.871	0.386	47	47	0.288	0.773
INSURANCE/RENTAL/INVESTMENT	118	32.814	35.473	-2.659	-0.171	0.865	109	2.065	1.769	0.295	0.033	0.973	57	61	-0.213	0.831
TRANSPORT	69	30.473	4.789	25.686	1.545	0.127	67	9.565	-0.983	10.548	0.922	0.36	39	30	1.438	0.15
BANKING/CREDIT/BROKING	8	28.855	-5.503	34.358	0.613	0.559	8	28.855	-5.503	34.358	0.613	0.559	4	4	0.42	0.674
INSURANCE/RENTAL/INVESTMENT	61	30.685	6.136	24.549	1.403	0.166	59	6.949	-0.37	7.319	0.678	0.5	35	26	1.361	0.173
COMMUNICATIONS	42	51.505	31.293	20.212	1.039	0.305	40	30.67	24.702	5.998	0.556	0.581	21	21	0.094	0.925
BANKING/CREDIT/BROKING	12	65.076	57.569	7.509	0.281	0.784	11	52.138	36.412	15.727	0.565	0.584	6	6	0	1
INSURANCE/RENTAL/INVESTMENT	30	46.076	20.783	25.293	1.002	0.325	29	22.568	20.261	2.307	0.213	0.833	15	15	0.339	0.734
WHOLESALE & RETAIL	154	15.636	11.973	3.663	0.295	0.769	148	-1.72	-1.617	-0.103	-0.013	0.989	73	81	-0.217	0.828
BANKING/CREDIT/BROKING	51	28.535	36.97	-8.434	-0.283	0.778	49	14.717	15.592	-0.874	-0.051	0.959	27	24	0.187	0.851
INSURANCE/RENTAL/INVESTMENT	103	9.249	-0.404	9.653	0.846	0.399	99	-9.856	-10.135	0.279	0.036	0.972	46	57	-0.484	0.629
SERVICES	147	75.098	10.875	64.223	2.38	0.019 **	134	6.378	-13.029	19.408	2.852	0.005 ***	82	65	2.643	0.008 ***
BANKING/CREDIT/BROKING	54	44.239	16.882	27.357	1.016	0.314	49	-0.399	-5.957	5.559	0.513	0.61	25	29	0.245	0.806
INSURANCE/RENTAL/INVESTMENT	93	93.016	7.387	85.629	2.161	0.033 **	85	10.285	-17.106	27.391	3.166	0.002 ***	57	36	3.052	0.002 ***
TOTAL	716	38.113	18.846	19.268	2.626	0.009 ***	677	9.087	1.249	7.838	2.327	0.02 **	357	359	1.55	0.121
BANKING/CREDIT/BROKING	256	39.706	31.319	8.387	0.837	0.403	242	20.68	11.779	8.902	1.458	0.146	126	130	0.661	0.509
INSURANCE/RENTAL/INVESTMENT	460	37.227	11.904	25.323	2.542	0.011 **	435	2.637	-4.608	7.246	1.812	0.071 *	231	229	1.448	0.148

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

^ As discussed in Section 5.3, the data in these Tables are based on incomplete periods of years in the case of some pairs of companies and the data should therefore be interpreted in relative rather than absolute terms.

sample companies' superior results are again statistically significant. After removing outliers, statistical significance in favour of the sample companies continues to be demonstrated in the primary sector but in the case of the wholesale & retail sector the non-financial companies' results are statistically significantly *worse* than the match companies' in the paired sample t-test at a 5% probability level.

The results for two sub-periods for the Full data set shown in Table 6.8 reflect those of the 1989 - 1998 period with the sample companies' overall mean IR values, prior to removing outliers, being superior or equivalent to those of the match companies' in all industries except transport. Statistical significance in favour of the sample companies emerges in the primary sector in the 1989 - 1993 period and in the services sector in the 1994 - 1998 period. The position does not change materially after removing outliers, with the sample companies' results being generally superior to, or marginally lower than, those of the match companies. These results are generally corroborated by the results of the Uninterrupted data set shown in Appendix L.

6.4.2 SEG Sample

The SEG sample results shown in Tables 6.9 and Appendix M corroborate the conclusions reached in the previous Section insofar as, in the Full data set over the ten-year period, the sample companies' results are generally superior, or equivalent to, those of the match companies. After removing outliers, statistical significance in favour of the sample companies again emerges in the case of the primary sector in the paired sample t-test at a 10% probability level whilst in the wholesale & retail area the sample companies' results are inferior to the match companies though the difference in performance is not statistically significant. The uninterrupted IR data results corroborate those of the Full data set except that the non-financial companies' superior results in the primary sector do not demonstrate statistical significance.

Reflecting the ten-year period results, the non-financial companies' results in the sub-periods in both the Full and Uninterrupted data sets are again generally superior to the match companies' with statistical significance in favour of the sample companies emerging in the 1989 - 1993 period in the primary, wholesale & retail and services sectors. Although, after removing outliers, the sample companies' results in the

TABLE 6.9: SEG SAMPLE IR% 1989 - 1998:- FULL DATA BY PRIMARY SIC CODE^

SAMPLE	Paired t-Test Full Data						Paired t-Test Excluding Outliers						Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)
1989 - 1998																
AGRICULTURE, MINING ETC.	21	104.116	53.526	50.589	1.131	0.272	19	48.1	4.614	43.486	1.906	0.073 *	15	6	1.547	0.122
MANUFACTURING	54	160.416	133.92	26.496	0.73	0.469	51	142.084	100.162	41.922	1.351	0.183	29	25	0.908	0.364
TRANSPORT & COMMUNICATIONS	15	51.562	43.823	7.739	0.300	0.768	15	51.562	43.823	7.739	0.300	0.768	9	6	0.114	0.91
WHOLESALE & RETAIL	32	110.308	79.994	30.313	0.457	0.651	30	48.737	50.240	-1.504	-0.050	0.961	17	15	-0.15	0.881
SERVICES	26	77.271	24.563	52.708	1.022	0.317	25	29.178	9.144	20.034	0.482	0.634	11	15	-0.165	0.869
TOTAL	148	115.954	82.51	33.444	1.495	0.137	140	79.465	54.208	25.257	1.634	0.105	81	67	1.122	0.262
1989 - 1993																
AGRICULTURE, MINING ETC.	15	89.935	16.009	73.926	2.124	0.052 *	15	89.935	16.009	73.926	2.124	0.052 *	13	2	2.499	0.012 **
MANUFACTURING	35	62.061	40.064	21.997	1.457	0.154	35	62.061	40.064	21.997	1.457	0.154	24	11	1.556	0.12
TRANSPORT & COMMUNICATIONS	5	126.488	63.851	62.636	0.682	0.533	5	126.488	63.851	62.637	0.682	0.533	2	3	0.135	0.893
WHOLESALE & RETAIL	20	87.502	44.590	42.912	2.176	0.042 **	20	87.502	44.590	42.912	2.176	0.042 **	13	7	1.829	0.067 *
SERVICES	15	124.044	29.209	94.835	1.406	0.181	13	35.002	-6.541	41.542	2.065	0.061 *	8	7	1.306	0.191
TOTAL	90	86.27	36.57	49.697	3.257	0.002 ***	88	72.258	31.459	40.798	3.689	0.000 ***	60	30	3.535	0 ***
1994 - 1998																
AGRICULTURE, MINING ETC.	21	22.045	15.981	6.064	0.312	0.758	21	22.045	15.981	6.064	0.312	0.758	9	12	-0.087	0.931
MANUFACTURING	54	86.91	73.757	13.153	0.607	0.546	53	86.296	65.437	20.86	1.011	0.317	27	27	0.555	0.579
TRANSPORT & COMMUNICATIONS	15	5.072	17.809	-12.737	-0.619	0.546	15	5.072	17.809	-12.737	-0.619	0.546	8	7	-0.114	0.91
WHOLESALE & RETAIL	32	34.510	30.701	3.808	0.104	0.918	31	6.646	28.112	-21.466	-0.788	0.437	15	17	-0.43	0.667
SERVICES	26	-1.202	1.563	-2.765	-0.129	0.899	26	-1.202	1.563	-2.765	-0.129	0.899	12	14	-0.419	0.675
TOTAL	148	42.603	37.897	4.706	0.387	0.7	146	36.216	34.13	2.086	0.194	0.847	71	77	-0.123	0.902

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

^ As discussed in Section 5.3, the data in these Tables are based on incomplete periods of years in the case of some pairs of companies and the data should therefore be interpreted in relative rather than absolute terms.

wholesale & retail sector are superior to the match companies' in the 1989 - 1993 period, the opposite position occurs in the later sub-period such that over the ten-year period the match companies outperform the sample companies.

6.4.3 Summary and Conclusions

The conclusions reached from the analysis of the compounded annual IR results of the non-financial companies categorised by the type of primary industry in which they are engaged may be summarised as follows:

(i) differences in the sample companies' financial performance emerge when the companies are grouped according to their primary industry. The sample companies' overall financial performance in the SIC sample Full data set over the ten-year period is superior to that of the match companies in all industries except for transport, with statistical significance being demonstrated in the primary sector (agriculture, mining etc.). After removing outliers, the manufacturing, communications and services overall IR results also become statistically significant in favour of the sample companies.

(ii) confirming the results obtained in Section 6.2, differences are also apparent in the sample companies' results within the financial services sub-groupings in the different industries. In the insurance, rental and investment areas, the sample companies' results are superior to those of the match companies in all industries except for transport with the difference in performance being statistically significant in the services sector. In the case of banking, credit and broking, prior to removing outliers the sample companies' results are superior to the match companies' in all industries except manufacturing and services, with the difference in performance being statistically significant in the primary sector. After removing outliers, the sample companies' results are superior to those of the match companies in all industries.

As was discussed in greater detail in Section 6.4.1, the above results are generally corroborated by the Uninterrupted data set analysis except that, in the banking, credit and broking area the sample companies' results before removing outliers are inferior to the match companies' in all industries except for the primary sector. Furthermore, after

removing outliers, the non-financial companies' IR results in the wholesale & retail sector are statistically significantly *worse* than the match companies'.

6.5 Segmental Analysis

This Section seeks to determine whether the degree of diversification by the sample companies into financial services activities influences their IR results. To investigate this, the SIC sample non-financial companies for which segmental sales data were available were divided into four groups according to the percentage of their total sales represented by their financial services sales. (All the segmental sales data available was utilised for the purposes of this exercise. Whilst 77.3% of the data related to 1998 sales, 22.7% related to earlier or later time periods).

The first of the four groups consisted of companies whose financial services sales represented up to 10% of their total sales. The second, third and fourth groups were made up of companies whose financial services sales represented 10%+ to 20%, 20%+ to 35% and 35%+ to 50% respectively of their total sales. The results of the analysis for the 1989 - 1998 period are shown in Table 6.10 for the Full data set and in Table 6.11 for the Uninterrupted data set and indicate the following progression. When the financial services segment represents up to 20% of the non-financial companies' total sales, the non-financial companies' IR results are worse than, or equivalent to, those of the match companies. At 20%+ to 35%, the non-financial companies' IR results are statistically significantly superior to those of the match companies in all the statistical tests carried out both before and after removing outliers. (This is at a probability level of 1% in the Wilcoxon signed ranks test and in the paired sample t-test after removing outliers). At 35%+ to 50%, the non-financial companies' IR results are once again worse than, or equivalent to, those of the match companies.

It results from the above analysis that the non-financial companies achieve superior IR results when their financial services segment represents 20%+ to 35% of their total sales. The non-financial companies' results are worse than, or equivalent to, those of the match companies at diversification levels below 20% or between 35% and 50%. Diversification levels greater than 50% fall beyond the scope of this study. The IR

TABLE 6.10: SIC SAMPLE IR% 1989 - 1998:- FULL DATA SUMMARY BY FINANCIAL SERVICES SALES SEGMENTS ^

SAMPLE	Paired t-Test Full Data							Paired t-Test Excluding Outliers							Wilcoxon signed ranks test				
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
UP TO 10%	209	78.451	167.259	-88.808	-1.357	0.176		197	48.007	37.738	10.269	1.058	0.291		91	118	-0.8	0.424	
10% + TO 20%	66	116.365	112.826	3.539	0.095	0.924		61	50.919	42.029	8.89	0.558	0.579		29	37	-0.016	0.987	
20%+ TO 35%	38	123.784	14.231	109.553	2.341	0.025	**	37	75.98	6.292	69.688	2.769	0.009	***	24	14	2.56	0.01	***
35%+ TO 50%	18	20.017	35.749	-15.733	-1.180	0.254		18	20.017	35.749	-15.733	-1.180	0.254		5	13	-1.198	0.231	

^ As discussed in Section 5.3, the data in these Tables are based on incomplete periods of years in the case of some pairs of companies and the data should therefore be interpreted in relative rather than absolute terms.

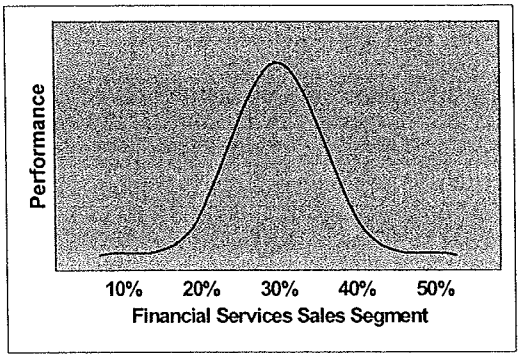
TABLE 6.11: SIC SAMPLE IR% 1989 - 1998:- UNINTERRUPTED DATA SUMMARY BY FINANCIAL SERVICES SALES SEGMENTS

SAMPLE	Paired t-Test Uninterrupted Data							Paired t-Test Excluding Outliers							Wilcoxon signed ranks test				
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
UP TO 10%	90	172.428	378.474	-206.046	-1.369	0.175		85	145.645	133.946	11.699	0.579	0.564		37	53	-0.678	0.498	
10% + TO 20%	29	217.179	278.624	-61.445	-0.891	0.381		27	174.129	183.82	-9.691	-0.450	0.656		10	19	-0.616	0.538	
20%+ TO 35%	15	253.925	49.281	204.643	1.983	0.067	*	14	136.883	30.804	106.078	3.232	0.007	***	12	3	2.84	0.005	***
35%+ TO 50%	5	115.491	100.837	14.654	0.420	0.696		5	115.491	100.837	14.655	0.42	0.696		3	2	0.405	0.686	

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

results after removing outliers suggest an 'inverted U' relationship between diversification into financial services and financial performance such as that depicted in Figure 6.1 which is similar to the relationship put forward by Palich et al. (2000) in their Hypothesis B shown in Figure 2.4.

FIGURE 6.1: FINANCIAL SERVICES DIVERSIFICATION LEVEL AND PERFORMANCE



6.6 Summary and Conclusions

Several detailed analyses of the SIC and SEG sample companies' compounded annual IR results were carried out in this Chapter. The IR results were analysed on the basis of the sample companies' financial services activities in Section 6.2, their geographic locations in Section 6.3, their primary industry in Section 6.4 and their segmental sales data in Section 6.5. The results were presented both before and after removing outliers. As previously stated, because of the relatively small size of the SEG sample, the conclusions reached in this Chapter were based mainly on the results of the SIC sample. Due to the relatively small number of companies in the financial services sub-groupings, the conclusions reached are explorative and suggestive rather than definitive.

It was concluded in Chapter 5 that:

1. There is strong evidence to suggest that over the 1989 - 1998 period the financial performance of the sample companies, as measured by their compounded annual IR values, was not inferior to that of the match companies. This conclusion holds when outliers are removed from the data. In no instance are the sample companies' results obtained in either the SIC or SEG sample statistically significantly worse than

those of the match companies. The sample companies do not therefore appear to have suffered any financial disadvantage through their involvement in financial services activities over the period.

2. There is evidence to suggest that the non-financial companies' financial performance during the 1989 - 1998 period was superior to that of the match companies. This evidence is strengthened when outliers are removed from the data.

The review of the IR results carried out in this Chapter generally confirms these conclusions when the non-financial companies' compounded annual IR results over the 1989 - 1998 period are analysed over a number of financial services products, geographic locations and primary industries with the following main qualifications:

(i) with regard to conclusion (1), no evidence was found of the non-financial companies IR results being statistically significantly worse than those of the match companies except in the case of the wholesale & retail sector's IR results in banking, credit and broking activities in the Uninterrupted data set.

However, whilst not being statistically significant except in the case noted above, some evidence of underperformance in the non-financial companies' IR results was also found, particularly with respect to:

- the IR results of the non-financial companies engaged in banking & credit activities which, prior to removing outliers, are generally inferior to those of the match companies. The position is however reversed when outliers are removed.

- the non-financial companies' IR results in Japan which are generally inferior to those of the match companies.

(ii) with regard to conclusion (2) considerable evidence, which in some instances is statistically significant, was found to support the conclusion that during the 1989 - 1998 period the non-financial companies' financial performance in certain financial services activities, geographic locations and primary industries was superior to that of the match companies. Thus:

- the IR results of the non-financial companies engaged in insurance, rental and investment activities are generally superior to those of the match companies and the difference in performance is in some instances statistically significant.

- the non-financial companies' overall IR results in North America, Europe and the Other Countries are generally superior or equivalent to those of the match companies and the difference in performance is in some instances statistically significant.

- the overall IR results of the non-financial companies whose primary industry is in the manufacturing, communications, services and primary (agriculture, mining etc.) sector are generally superior or equivalent to those of the match companies and the difference in performance is in some instances statistically significant. In particular, statistical significance is demonstrated in the case of banking, credit and broking activities in the primary sector and insurance, rental and investment activities in the services sector.

(iii) finally, differences in the sample companies' financial performance emerge when their results are analysed on the basis of the degree of their diversification into financial services activities. The evidence indicates that the non-financial companies achieved superior IR results when their financial services segment represented a certain proportion (20%+ to 35%) of their total sales.

In Chapter 8, the conclusions reached from the analyses carried out in this Chapter are discussed in further depth and synthesised with the theoretical arguments and hypotheses made in previous Chapters of this study.

CHAPTER 7: RESULTS III - ACCOUNTING RATIOS

7.1 Introduction

Following the analysis of the IR data carried out in Chapters 5 and 6, this Chapter presents an analysis of the accounting ratio data (Return on Assets (ROA), Return on Invested Capital (ROIC) and Return on Equity (ROE)) relating to the SIC and SEG sample and match companies obtained through the data collection process described in Chapter 4 and reaches conclusions based on this analysis. The Uninterrupted accounting ratio data for the two samples is analysed in Section 7.2 and parametric and non-parametric statistical tests are carried out on the data to determine whether any statistically significant differences exist between the financial performance of the sample and match companies. The results are discussed in Section 7.3 and analysed further in Section 7.4. Finally a summary of, and conclusions on, the results is provided in Section 7.5.

7.2 Results

7.2.1 SIC Sample

A summary of the results obtained from the statistical processing on SPSS of the SIC sample uninterrupted ROA, ROIC and ROE data both before and after removing outliers is presented in Table 7.1. The procedure used to identify outliers was similar to that described in Section 5.4 and the number of outliers removed from the respective samples is shown in Table 7.2.

Table 7.1 shows that in the 1989 - 1998 period, both before and after removing outliers, the absolute differences in the mean values of all three ratios are relatively small and none of the differences are statistically significant in any of the statistical tests carried out. The relationship between ROA and ROE which emerges from the data is of interest, however. Whilst the sample companies' mean ROA value is lower than that of

TABLE 7.1: SIC SAMPLE ACCOUNTING RATIOS 1989 - 1998:- UNINTERRUPTED DATA SUMMARY

SAMPLE	Paired t-Test Uninterrupted Data						Paired t-Test Excluding Outliers						Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)
1989 - 1998																
RETURN ON ASSETS %	284	5.957	6.15	-0.193	-0.372	0.71	272	5.73	5.91	-0.179	-0.655	0.513	149	135	-0.338	0.735
RETURN ON INVESTED CAPITAL %	260	8.995	8.79	0.205	0.37	0.712	252	8.267	8.299	-0.032	-0.085	0.933	141	119	0.032	0.974
RETURN ON EQUITY %	269	10.949	10.841	0.108	0.122	0.903	257	10.643	10.369	0.274	0.464	0.643	142	127	1.332	0.183
1989 - 1993																
RETURN ON ASSETS %	286	6.252	6.45	-0.198	-0.258	0.797	275	5.642	6.19	-0.549	-1.747	0.082 *	138	148	-0.985	0.325
RETURN ON INVESTED CAPITAL %	270	8.81	9.558	-0.748	-1.167	0.244	262	8.45	9.058	-0.609	-1.258	0.209	131	139	-0.473	0.636
RETURN ON EQUITY %	277	10.715	11.572	-0.858	-0.697	0.486	255	9.774	10.254	-0.48	-0.678	0.499	141	136	-0.203	0.839
1994 - 1998																
RETURN ON ASSETS %	498	5.182	5.346	-0.164	-0.377	0.707	481	5.034	5.047	-0.013	-0.054	0.957	272	226	0.624	0.533
RETURN ON INVESTED CAPITAL %	470	8.128	7.598	0.53	1.083	0.279	451	7.094	6.907	0.187	0.584	0.56	254	216	0.845	0.398
RETURN ON EQUITY %	480	10.447	8.626	1.821	1.905	0.057 *	451	9.41	8.036	1.374	2.466	0.014 **	269	211	2.756	0.006 ***

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

TABLE 7.2: OUTLIERS REMOVED FROM SIC SAMPLE ACCOUNTING RATIO DATA

PERIOD	Return on Assets				Return on Invested Capital				Return on Equity			
	Original Sample	Outliers		Sub-Sample	Original Sample	Outliers		Sub-Sample	Original Sample	Outliers		Sub-Sample
		#	%			#	%			#	%	
1989 - 1998	284	12	4.2	272	260	8	3.1	252	269	12	4.5	257
1989 - 1993	286	11	3.8	275	270	8	3.0	262	277	22	7.9	255
1994 - 1998	498	17	3.4	481	470	19	4.0	451	480	29	6.0	451

the match companies, the position is reversed with respect to the mean ROE value which is higher in the sample companies than in the match companies. As discussed in further detail in Section 7.4, the progression from a position where the sample companies' mean ROA value is lower than that of the match companies to a position where the sample companies' mean ROE value is higher than that of the match companies suggests that the sample companies benefited from advantageous financing structures in comparison to the match companies. This is because a company's ROA value is calculated prior to taking account of financing factors and the ROE value is then derived from the ROA value by including elements of the company's financing structure in the ROE calculations.

The pattern noted above also occurs in the 1994 - 1998 period, with the difference between the mean ROE values of the non-financial companies and the match companies being statistically significant in both the paired sample t-test and the Wilcoxon signed ranks test. In the 1989 - 1993 period, the sample companies' mean ROA values are again lower than those of the match companies but, in contrast to the trend noted in the other periods, prior to removing outliers the sample companies' lower mean ROA value translates into an even lower, rather than an improved, mean ROE value. However, the position is reversed when outliers are excluded and the trend noted in the other time periods again becomes apparent.

7.2.2 SEG Sample

A summary of the results obtained from the statistical processing on SPSS of the SEG sample uninterrupted ROA, ROIC and ROE data both before and after removing

TABLE 7.3: SEG SAMPLE ACCOUNTING RATIOS 1989 - 1998:- UNINTERRUPTED DATA SUMMARY

SAMPLE	Paired t-Test Uninterrupted Data						Paired t-Test Excluding Outliers						Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)
1989 - 1998																
RETURN ON ASSETS %	53	4.138	4.951	-0.813	-0.826	0.412	50	5.252	5.2	0.052	0.08	0.937	26	27	0.049	0.961
RETURN ON INVESTED CAPITAL %	46	9.046	10.325	-1.28	-0.867	0.39	42	8.592	9.184	-0.593	-0.491	0.626	22	24	-0.29	0.772
RETURN ON EQUITY %	47	10.261	9.693	0.568	0.295	0.769	42	11.327	9.685	1.641	1.056	0.297	23	24	0.36	0.719
1989 - 1993																
RETURN ON ASSETS %	54	4.416	4.29	0.127	0.131	0.897	53	5.565	4.8	0.766	1.025	0.31	29	25	0.607	0.544
RETURN ON INVESTED CAPITAL %	52	7.442	7.298	0.144	0.095	0.925	49	9.222	8.778	0.444	0.367	0.715	26	26	0.392	0.695
RETURN ON EQUITY %	56	9.237	3.049	6.188	1.855	0.069 *	49	12.241	9.391	2.85	1.51	0.138	33	23	1.591	0.112
1994 - 1998																
RETURN ON ASSETS %	99	4.299	5.18	-0.88	-1.23	0.222	96	4.906	5.2	-0.294	-0.576	0.566	46	53	-0.841	0.4
RETURN ON INVESTED CAPITAL %	88	7.77	9.635	-1.865	-1.319	0.191	82	7.02	7.688	-0.668	-0.943	0.349	41	47	-1.373	0.17
RETURN ON EQUITY %	89	9.326	10.027	-0.701	-0.343	0.732	81	10.318	10.568	-0.249	-0.179	0.858	43	46	-0.317	0.751

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

outliers is presented in Table 7.3 whilst the number of outliers removed from the respective samples is shown in Table 7.4.

TABLE 7.4: OUTLIERS REMOVED FROM SEG SAMPLE ACCOUNTING RATIO DATA

PERIOD	Return on Assets				Return on Invested Capital				Return on Equity			
	Original Sample	Outliers		Sub-Sample	Original Sample	Outliers		Sub-Sample	Original Sample	Outliers		Sub-Sample
		#	%			#	%			#	%	
1989 - 1998	53	3	5.7	50	46	4	8.7	42	47	5	10.6	42
1989 - 1993	54	1	1.9	53	52	3	5.8	49	56	7	12.5	49
1994 - 1998	99	3	3.0	96	88	6	6.8	82	89	8	9.0	81

The SEG sample results for the 1989 - 1998 period shown in Table 7.3 are similar to the results of the SIC sample insofar as the mean ROA value of the sample companies is lower than (prior to removing outliers) or equivalent to (after removing outliers) that of the match companies whilst the mean ROE value is higher which again indicates that favourable financing factors were responsible for transforming the sample companies' negative ROA result into a superior ROE result.

The results for the 1989 - 1993 period shown in Table 7.3 reflect those of the ten-year period: the sample firms' ROE value is higher than that of the match firms and, before removing outliers, the difference is statistically significant in the paired sample t-test at a probability level of 10%. The difference between the sample and match companies' mean ROE values is substantially greater than that between their mean ROA values indicating that, as in the 1989 - 1998 period, financing factors appear to have favourably influenced the sample companies' financial results.

In the 1994 - 1998 period the sample companies' mean ROA value is again lower than that of the match companies. The sample companies' mean ROE value is also (-0.701%) lower than that of the match companies though this difference reduces further to -0.249% after the removal of outliers. In neither instance (before or after removing outliers) is the difference between the sample and match companies' ROE values statistically significant.

7.3 Discussion on Results

It is concluded from the analysis presented above that:

(i) there is strong evidence to suggest that over the 1989 - 1998 period the financial performance of the sample companies, as measured by their ROE results, was not inferior to that of the match companies.

(ii) there is some evidence, though this is marginal, to suggest that the sample companies' financial performance, again as measured by their ROE results, was superior to that of the match companies.

(iii) there is evidence to suggest that the sample companies benefited from advantageous financing structures in comparison to those of the match companies.

These observations support the conclusion reached in Chapter 5 that the sample companies do not appear to have suffered any financial disadvantage through their involvement in financial services activities and lend marginal support to the conclusion that the sample companies' financial performance was superior to that of the match companies.

The evidence leading to these conclusions may be summarised as follows:

(i) in both samples, the sample companies' mean ROE values are in most instances higher than those of the match firms though these results are statistically significant only in the 1994 - 1998 period in the SIC sample and in the 1989 - 1993 period in the SEG sample, the latter prior to removing outliers. In no instance, however, are the sample companies' results statistically significantly worse than those of the match companies.

(ii) in both the SIC and SEG samples, there appears to be a trend towards a progression from a position where the sample companies' mean ROA value is lower than, or equivalent to, that of the match companies to a position where the sample companies' mean ROE value improves in comparison to that of the match companies.

This suggests that the sample companies benefited from advantageous financing structures which could have been brought about by reductions in transactions costs through the creation of internal capital markets. The literature acknowledges that such benefits can arise as a result of diversification and this issue is explored in further depth below.

As in the case of the IR data, the results obtained from the analysis of the SIC and SEG samples' accounting ratio data are remarkably consistent with each other. As previously noted, the consistency in the results is noteworthy in view of the fact that a different process was used to identify the match companies in the SIC and SEG samples and the match companies chosen in the two samples are thus different. Furthermore, the match companies in the SEG sample are pseudo companies and their results represent a hypothetical amalgamation of the sample companies' activities whereas the sample companies' results in the SIC sample are those of existing companies in their entirety. Notwithstanding these factors, the results of the SIC sample corroborate those of the SEG sample.

It is also relevant to point out that in both samples the results obtained from the stock market and accounting data also corroborate each other insofar as the mean IR and ROE values of the sample companies are generally higher than or equivalent to those of the match companies. This notwithstanding the facts that (a) the two data sets were derived from different sources, namely market data in the case of IR and companies' financial statements in the case of ROE and (b) the method of calculation of the two figures for the ten-year and five-year periods were different insofar as ROE was calculated by averaging the individual years' figures whilst IR was calculated by compounding them. However, following the discussion in Section 3.5, a degree of association would be expected to exist between companies' share return and their accounting statements since both provide information on a firm's value at a point in time and changes in its value over periods of time.

7.4 Ratio Analysis

As noted above, in both the SIC and SEG samples, there appears to be a trend towards a progression from a position where the sample companies' mean ROA value is lower

than, or equivalent to, that of the match companies to a position where the sample companies' mean ROE value improves in comparison to that of the match companies and this trend is investigated in further depth in this Section.

In the Worldscope database, Return on Invested Capital (ROIC) differs from ROA primarily insofar as, as detailed in Appendix A, all of a company's assets are included in the ROA calculation whilst in the ROIC calculation non-interest bearing liabilities (except for shareholders' capital and minority interest) are netted off from total assets. In both the ROA and ROIC calculations, income is taken after taxation but prior to deduction of debt interest. ROE differs from ROIC primarily insofar as a company's debt interest is netted off from its income whilst all its interest-bearing and non interest-bearing liabilities, except for the equity portion, are netted off from its total assets. Since it is thus financing factors which differentiate the ROIC calculation from the ROA calculation, and the ROE calculation from the ROIC calculation, the progression from a position where several of the sample companies' mean ROA values in Tables 7.1 and 7.3 are lower than that of the match companies to a position where the sample companies' mean ROE values are higher than those of the match companies, may be attributed to favourable financing arrangements in the sample companies. This analysis indicates that the sample companies were in a position to improve their financing structures compared to those of the match companies such that they achieved superior mean ROE values notwithstanding their initially disadvantageous mean ROA value positions. Following the above discussion, two elements in the sample companies' financing structure which could be responsible for translating their disadvantageous ROA position into a superior ROE position are:

(i) a lower cost of non-equity capital (creditors, bank financing, debt capital etc.) than the match companies. These sources of finance may or may not be interest-bearing.

(ii) a greater utilisation of non-equity capital than the match companies.

(As discussed in Section 2.3.3.4, an increased use of interest-bearing non-equity capital such as bank loans and bonds may also have a negative effect on a firm's financial performance. This is because, due to the need to make interest payments, an increase in

the amount of debt a firm carries would increase the volatility of its earnings and thus increase the level of risk associated with its shares which may reduce their market value).

The improvement from the ROA level to the ROE level which occurs in the sample companies' results in the SIC sample is illustrated in Tables 7.5 and 7.6 which show the percentage differences between the sample and match companies' ROA and ROE ratios prior to and after removing outliers. Taking the SIC sample 1989 - 1998 results in Table 7.5 as an example, the difference in percentage terms between the sample and match companies' mean ROA values (5.957% and 6.15% in Table 7.1 respectively) is first calculated (-3.14%) and this is then subtracted from a similar figures for ROE (1.00%) to obtain the percentage difference between the ROE/ROA figures (4.14%).

TABLE 7.5: SIC SAMPLE: % DIFFERENCES IN MEAN ROA% AND ROE %

RATIO	N	% DIFFERENCE SAMPLE/MATCH 1989 - 1993	N	% DIFFERENCE SAMPLE/MATCH 1989 - 1993	N	% DIFFERENCE SAMPLE/MATCH 1994 - 1998
ROA	284	-3.14%	286	-3.07%	498	-3.07%
ROE	269	1.00%	277	-7.41%	480	21.11%
ROE - ROA		4.14%		-4.34%		24.18%%

TABLE 7.6: SIC SAMPLE EXCLUDING OUTLIERS: % DIFFERENCES IN MEAN ROA% AND ROE %

RATIO	N	% DIFFERENCE SAMPLE/MATCH 1989 - 1993	N	% DIFFERENCE SAMPLE/MATCH 1989 - 1993	N	% DIFFERENCE SAMPLE/MATCH 1994 - 1998
ROA	272	-3.05%	275	-8.85%	481	-0.26%
ROE	257	2.64%	255	-4.68%	451	17.10%
ROE - ROA		5.69%		4.17%		17.36%%

Similar data for the SEG sample is presented in Tables 7.7 and 7.8.

TABLE 7.7: SEG SAMPLE: % DIFFERENCES IN MEAN ROA% AND ROE %

RATIO	N	% DIFFERENCE SAMPLE/MATCH 1989 - 1993	N	% DIFFERENCE SAMPLE/MATCH 1989 - 1993	N	% DIFFERENCE SAMPLE/MATCH 1994 - 1998
ROA	53	-16.42%	54	2.94%	99	-17.01%
ROE	47	5.86%	56	202.95%	89	-6.99%
ROE - ROA		22.28%		200.01%		10.02%

TABLE 7.8: SEG SAMPLE EXCLUDING OUTLIERS: % DIFFERENCES IN MEAN ROA% AND ROE %

RATIO	N	% DIFFERENCE SAMPLE/MATCH 1989 - 1993	N	% DIFFERENCE SAMPLE/MATCH 1989 - 1993	N	% DIFFERENCE SAMPLE/MATCH 1994 - 1998
ROA	50	1.00%	53	15.94%	96	-5.65%
ROE	42	16.95%	49	30.35%	81	-2.37%
ROE - ROA		15.95%		14.41%		3.28%

As can be seen from the SIC sample results in Table 7.5, the percentage difference between the sample and match companies' mean ROA and ROE values represents an improvement in favour of the sample companies in the 1989 - 1998 period (4.14%) and in the 1994 - 1998 period (24.18%) but not in the 1989 - 1993 period (-4.34%). The position in the latter period is reversed in Table 7.6 however, where after removing outliers the percentage differences invariably represent improvements in favour of the sample companies. In the SEG sample, the percentage differences between the sample and match companies' mean ROA and ROE values represent improvements in favour of the sample companies in all time periods both before and after removing outliers. The positive percentage differences vary from a maximum of 200.01% in the SEG sample 1989 - 1993 period prior to removing outliers to a minimum of 3.28% in the same sample in the 1994 - 1998 period after removing outliers.

7.5 Summary and Conclusions

On the basis of the results presented above, the conclusions reached in this Chapter are summarised as follows:

(i) there is strong evidence to suggest that over the 1989 - 1998 period the financial performance of the sample companies, as measured by their ROE results,

was not inferior to that of the match companies. This conclusion holds when outliers are removed from the data. In no instance are the sample companies' results obtained in either the SIC or SEG sample statistically significantly worse than those of the match companies. The sample companies do not therefore appear to have suffered any financial disadvantage through their involvement in financial services activities.

(ii) there is some evidence to suggest that the sample companies' financial performance during the 1989 - 1998 period was superior to that of the match companies. However, this evidence is not statistically significant.

(iii) the relationship between the ROA, ROIC and ROE ratios suggests that the sample companies may have benefited from advantageous financing structures which could have been brought about by reductions in transactions costs through the creation of internal capital markets. The results on which these observations are made are not statistically significant but they persist over all time periods in both samples.

In Chapter 8, the conclusions reached from the analyses carried out in this Chapter are discussed in further depth and synthesised with the theoretical arguments and hypotheses made in previous Chapters of this study.

CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

In this Chapter, the results which emerged from the analysis of the data carried out in Chapters 5, 6 and 7 are synthesised with the theoretical arguments made in previous Chapters. The main research findings which emerged from the three Results Chapters are summarised in Section 8.2 and this is followed by a discussion on the research conclusions in Section 8.3. In Section 8.4 the main contributions of the research study are outlined whilst the limitations of the study are noted in Section 8.5. Finally, recommendations for future research are made in Section 8.6.

8.2 Main Research Findings

In the discussion in Section 3.6, it was hypothesised that diversification into the financial services industry would significantly improve the financial performance of non-financial companies which diversify into the industry on the grounds that these companies would benefit from the achievement of economies of scope and the reduction of transactions costs. Both of these factors would be expected to improve a firm's profitability and thereby lead to an increase in the firm's share return. In particular, it was argued that:

- several opportunities existed for non-financial firms to derive synergies and economies of scope in the financial services area by, for example, using their existing client base, brand name and distribution channels to market financial services products (Grant (1987), Leach (1994)). The literature indicates that these benefits are more likely to be obtained by companies which engage in related, rather than conglomerate, diversification. The literature also suggests that a moderate amount of diversification is more likely to be associated with related than with conglomerate diversification. By definition, non-financial companies are engaged in a moderate amount of diversification into financial services activities and it was thus surmised that several of the non-financial firms would be engaged in financial services activities which are in some way related to their existing activities or assets (such as providing

credit or rental facilities related to their current activities or assets) and should thus be in a good position to take advantage of synergies and economies of scope. However, the possibility that that some of the non-financial firms may be concurrently, or solely, following a strategy of unrelated diversification was not excluded.

(Following the definitions of related and conglomerate diversification made in Section 1.5, diversification into financial services may represent both a related and a conglomerate form of diversification, depending upon the relationship between a firm's existing assets or activities and the financial services it offers. A firm may offer financial services such as banking, providing credit facilities, broking, rental and leasing, insurance, and investment services only with respect to its existing business activities and only utilising its existing assets, in which case it may be considered to be following a strategy of related diversification, or it may offer these services with respect to business activities unconnected with its current business activities and its existing assets, in which case it may be considered to be following a strategy of unrelated or conglomerate diversification).

- the reduction of transactions costs through the creation of internal capital and other markets has been identified by several authors as a major potential benefit of both related and conglomerate diversification (Williamson (1975), Grant (1995), Stein (1997)). Several opportunities exist for non-financial firms to develop internal capital and other markets and reduce their transactions costs by diversifying into financial services activities. Transactions costs may be reduced by, for example, the handling of a firm's insurance requirements by its own insurance operation. A firm's involvement in financial services activities and the development of its competencies in this area would enhance its opportunities and its ability to create and operate an internal capital market.

The main findings which emerged from the research carried out in Chapters 5, 6 and 7 with respect to the sample and match companies' compounded annual IR's and accounting ratios to test the above hypotheses may be summarised as follows. As discussed in Section 5.7, although the IR results of only a few individual years in the data sets examined were statistically significant, the results for the five and ten year periods, which in several instances are statistically significant, are held to be more

appropriate indicators of the difference between the sample and match companies' share return performance than the annual results for the reasons noted in the Section.

(i) there is strong evidence to indicate that, when the non-financial companies' IR results are considered at a global level, their financial performance over the 1989 - 1998 period was not inferior to that of the control companies. In no instance were the sample companies' global results statistically significantly worse than those of the control companies.

(ii) there is evidence to suggest that, when the non-financial companies' IR results are considered at a global level, their financial performance during the 1989 - 1998 period was superior to that of the control companies. This evidence is statistically significant in several instances.

(iii) the evidence relating to (i) and (ii) is not uniform across all financial services products, geographic areas and primary industries analysed, however. There is evidence to indicate that, whilst the non-financial companies' overall IR results were generally superior to those of the control companies in North America, Europe and the Other countries, their results were marginally inferior to the control companies' in Japan. Similarly, whilst the evidence indicates that the overall IR results of the non-financial companies engaged in insurance, rental and investment activities were generally superior to those of the control companies, evidence of underperformance emerged in the case of the non-financial companies engaged in banking, credit and broking activities, though this was the case only prior to removing outliers. Finally, differences emerged when the non-financial companies' results were analysed on the basis of the primary industry in which they were involved. Thus, whilst statistical significance in favour of the non-financial companies was demonstrated in the primary sector (agriculture, mining etc.) in the case of banking, credit and broking activities, the opposite was the case in the wholesale & retail sector where statistical significance in favour of the control companies emerged.

(iv) when the non-financial companies' financial performance was analysed on the basis of the degree of their diversification into financial services activities, the evidence indicated that the non-financial companies achieved superior IR

results when their financial services segment represented a certain proportion (20%+ to 35%) of their total sales.

(v) when the non-financial and control companies' accounting ratio data were analysed, there was evidence to indicate that the former companies benefited from advantageous financing structures such that their initially disadvantageous ROA ratios were translated into advantageous ROE ratios. The non-financial companies' ROE results are generally superior to those of the control companies, supporting the conclusions on the non-financial companies' superior IR results reached in (i) and (ii) above.

8.3 Main Research Conclusions

The above findings are related to the hypotheses formulated above on the diversification of non-financial companies into the financial services industry as follows. Firstly, the fact that the non-financial companies' overall financial performance was not statistically significantly worse, and in several instances was statistically significantly superior to the control companies', indicates that certain factors favourably influenced the non-financial companies' results whilst not having any negative effects upon them. It has been argued above that, when firms engage in related diversification, which in the literature is equated with a moderate amount of diversification, they would be expected to derive benefits from synergy and from economies of scope. Furthermore, diversified firms would be expected to derive benefits from the reduction of transactions costs through the creation of internal capital and other markets if they engaged in both related and conglomerate diversification. However, conglomerate diversification would be expected to eventually result in diminishing returns due to, amongst other factors, the difficulties involved in obtaining benefits from synergy and from economies of scope and in managing the more complex organisation as it grows larger.

In view of the above discussion, the evidence that the non-financial companies' overall financial performance was not statistically significantly worse than, and in several instances was statistically significantly superior to, the control companies' is not unexpected. This is because, as shown in Section 4.3, the non-financial companies' financial services segment sales value amounts to an average of 8.3% to 11.1% of their

total sales which confirms that these companies are engaged in a moderate amount of diversification into the financial services industry and are thus likely to be engaged in related diversification. The non-financial companies would therefore be expected to obtain benefits from synergy and economies of scope as well as benefits from the reduction of transactions costs through the creation of internal capital and other markets. On the other hand, they would not be expected to suffer from the disadvantages arising from conglomerate diversification which could lead to an inferior financial performance.

The evidence obtained from the accounting ratio data indicates that the non-financial companies obtained benefits from the creation of internal capital markets and the reduction of transactions costs associated with this but not from economies of scope. Oster (1994) notes that economies of scope arise when the costs of production of two lines of business run together are less than the sum of each run separately. Panzar and Willig (1981) observe that economies of scope arise in circumstances where certain resources possessed by a firm such as its top management and its distribution channels, whilst only being available in units of a certain minimum size, can be utilised in the production of more than one product line. If these resources are not being used to their full capacity to produce the firm's current product lines, diversification by the firm into new product lines would result in a fuller utilisation of the resources without a corresponding increase in the firm's costs. The costs of producing the current and the new product lines together would thus be less than the sum of the costs of producing them separately.

Thus, if the non-financial companies were deriving economies of scope from their diversification into financial services activities, it would be expected that their ROA (Return on Assets) ratios would be superior, or at least at the same level as, those of the control companies. This would be due to a greater utilisation of the non-financial companies' resources without a corresponding increase in their costs. It was however noted in Chapter 7 that over the 1989 - 1998 period the non-financial companies' ROA ratios were generally inferior to the control companies' which indicates that the former companies utilised their assets less efficiently, rather than more efficiently, than the latter companies. However, whilst the non-financial companies' ROA ratios were generally inferior to the control companies', their ROE (Return on Equity) ratios over

the period were always superior. (Although the results on which these observations are made are not statistically significant, they persist over all the time periods analysed). This lead to the conclusion that the non-financial companies benefited from advantageous financing structures such that their initially disadvantageous ROA ratios were translated into superior ROE ratios. Since the main characteristic which distinguishes the non-financial companies from the control group of companies in this study is the former companies' involvement in providing financial services, it is hypothesised that it was this involvement which resulted in the non-financial companies having advantageous financing structures.

As discussed in Section 7.4, two elements in the non-financial companies' financing structures which could translate a disadvantageous ROA position compared to the control companies into a superior ROE position are a lower cost of non-equity capital and a greater utilisation of non-equity capital than the control companies. (A caveat was made in the discussion with respect to the increased risks associated with the greater utilisation of interest-bearing non-equity capital). It was argued above that the creation of internal capital markets and the reduction of transactions costs associated with this are a potential benefit of diversification into financial services activities. A firm's involvement in financial services activities and the development of its competencies in this area would enhance its opportunities and its ability to create and operate an internal capital market. The firm's opportunities and ability to liase and interface with external suppliers of funds would also be enhanced. By creating an internal market for the funds generated by its operations, a firm could reduce the costs involved in obtaining non-equity capital and thus reduce the cost of this capital. By enhancing its opportunities and competencies to liase and interface with external suppliers of funds, a firm could increase its ability to obtain non-equity capital. Both instances could result in the translation of a disadvantageous ROA position into a superior ROE position.

Stein (1997) remarks that the creation and utilisation of internal capital markets are particularly beneficial to firms operating in countries in which external capital markets are comparatively undeveloped due to the relatively high transactions costs and agency problems which may arise in the latter. Walter (1999) adds that internal capital markets may also have a powerful role to play in firms operating in countries such as France and Germany in which, although the external capital markets are comparatively developed,

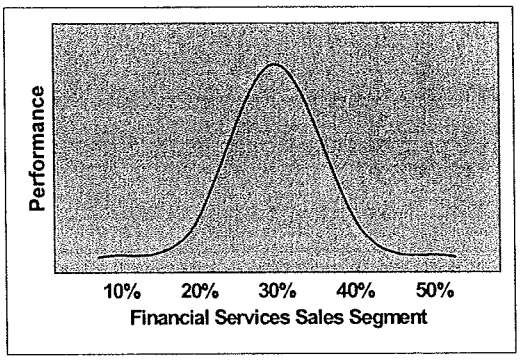
shareholdings in companies are often relatively concentrated which may result in firms' internal capital markets being more efficient in sourcing and allocating financial resources than the external markets. Since several of the non-financial and control companies in this study were located in countries such as France and Germany where shareholdings in companies are relatively concentrated, or in countries in which the external capital markets are comparatively undeveloped, it is hypothesised that the opportunities available to the non-financial companies in these countries to develop their internal capital markets through their diversification into financial services activities and take advantage of the reduction of transactions costs associated with this were important factors which contributed to the achievement of the non-financial companies' IR results outlined above. In this context it is relevant to note that statistical significance emerged in both the European and Other countries' IR results.

Synergy is defined by Johnson and Scholes (1993, p.229) as a situation where "two or more activities or processes complement each other to the extent that their combined effect is greater than the 'sum of the parts'". Although as discussed above no evidence of economies of scope was detected in the data reviewed, evidence of synergy does emerge from the analyses. This is particularly evident in the SEG sample in which the control companies are pseudo companies whose IR results represent a hypothetical amalgamation of the non-financial companies' activities; on the other hand, the non-financial companies' IR results are those of existing companies in their entirety. Thus, the control companies' IR results represent the 'sum of the parts' whilst the non-financial companies' results represent the combined effect of the non-financial activities and the financial services activities carried out by the non-financial companies. The non-financial companies' superior IR results in the SEG sample thus indicate that the combined effect of the financial services activities and the non-financial activities carried out by the non-financial companies was greater than the 'sum of the parts.' Following the analysis carried out above, it is hypothesised that the non-financial companies' advantageous financing structures which, as argued above, they developed through their diversification into financial services activities, contributed towards the creation of this synergistic effect.

The evidence gathered in this study also indicates that the non-financial companies' IR results vary according to the degree of their diversification into financial services

activities, with their IR results being statistically significantly superior when their financial services segment represents around one-fifth to one-third of their total sales. The non-financial companies' results are worse than, or equivalent to, those of the control companies at diversification levels below or above these thresholds. These conclusions are not surprising since it would be expected that the non-financial companies' involvement in financial services activities would need to reach a certain size before it would impact significantly upon their financial performance. It is also not unexpected that the non-financial companies' IR results would deteriorate as their degree of diversification into financial services approaches 50% due to the difficulties associated with conglomerate diversification discussed above. These results suggest an 'inverted U' relationship between diversification and financial performance such as that depicted in Figure 8.1 which is similar to the relationship put forward by Palich et al. (2000) in their Hypothesis B shown in Figure 2.4.

FIGURE 8.1: FINANCIAL SERVICES DIVERSIFICATION LEVEL AND PERFORMANCE



This progression supports the hypothesis put forward in the literature (Rumelt (1974), Palich et al. (2000)) that firms' financial performance improves as they diversify into related activities but then deteriorates as they diversify further into unrelated activities.

As noted above, the evidence relating to the non-financial companies' IR results is also not uniform across all financial services products, geographic areas and primary industries. Notably, whilst the non-financial companies' IR results are in several instances statistically significantly superior to those of the control companies in North America, Europe and the Other countries, this is never the case in Japan where the non-

financial companies' results were generally marginally inferior to those of the control companies. As discussed in Section 5.2, whereas the period between 1989 and 1998 was generally an expansionary phase for the former countries, the Japanese economy suffered from several vicissitudes during these years. It is thus hypothesised that a link may exist between the state of the economy and non-financial companies' financial performance insofar as diversification into financial services activities may result in financial benefits to firms during periods of economic expansion but not during a recessionary phase. This could arise because financial services activities would be negatively affected by factors such as falling share prices and defaults by debtors which are more likely to occur in a recessionary period. A further reason for the non-financial companies' relatively poor financial performance in Japan may lie in the fact that, as shown in Section 4.3, the non-financial companies' mean financial segment in this country only amounted to 4.4% of their total sales which is the lowest of the four geographic areas analysed and well below the global mean of 8.3%. Following the discussion in the previous paragraph, this may indicate that the level of the Japanese companies' diversification into financial services activities was insufficient to significantly affect their financial performance.

As discussed above, whilst the overall IR results of the non-financial companies engaged in insurance, rental and investment activities were generally superior to those of the control companies, evidence of underperformance emerged in the case of the non-financial companies engaged in banking, credit and broking activities, though this was the case only prior to removing outliers. This evidence suggests, however, that the non-financial companies may have experienced greater difficulty in diversifying into, and deriving financial benefits from, banking activities than was the case with other financial services activities. Several reasons may be surmised for this, particularly that the regulatory and infrastructural barriers to entry into banking activities were greater than those relating to other financial services activities. Furthermore, more specialist expertise may be required to provide banking services than in the case of other financial services activities. A further factor may lie in the competitive advantage which the provision of financial services may give non-financial companies. Thus, the provision of banking, credit and broking services in the wholesale & retail sector may have given non-financial companies relatively little competitive advantage due to the intense competition in this field. On the other hand, the provision of these financial services in

the primary sector (agriculture, mining etc.) may have given the non-financial companies engaged in these activities substantial competitive advantage since there is relatively less competition in this field. It should, however, be noted that the reasons put forward above are conjectural and further investigation is necessary to test their validity.

8.4 Contribution of the Research

It was pointed out in the Literature Review that, although a number of research studies have been carried out to investigate the relationship between diversification and firms' financial performance, the results of these studies is not conclusive. Although it would be expected that firms would benefit by diversifying into related areas of activity since this would give them opportunities to reap synergy and economies of scope, as well as to reduce their transactions costs through the creation of internal capital and other markets, the empirical research evidence does not conclusively demonstrate that related diversification has generally had a positive effect upon firms' performance. On the other hand, theoretical considerations indicate that conglomerate diversification would not be expected to significantly improve firms' performance and the empirical evidence generally corroborates this expectation.

The main contributions made by this research study may be viewed at two levels. At one level, the study provides insights into whether a business phenomenon which is widespread and which is growing in scale and importance, namely the diversification of non-financial companies into the financial services industry, has resulted in any financial benefit or disadvantage to the firms which implemented this strategy. Except in one instance, the study did not find any statistically significant evidence that the non-financial companies had suffered any financial disadvantage by diversifying into financial services activities. On the other hand, in several instances the non-financial companies' financial results were statistically significantly superior to those of comparable companies which were not involved in providing financial services. This leads to the conclusion that the non-financial companies generally reaped financial benefits by diversifying into financial services whilst they did not generally suffer financial disadvantages by implementing this strategy. The study also reveals that differences in the non-financial companies' financial performance emerge when these are analysed according to the different types of financial services products they offer,

the geographic areas in which they operate and the primary industry in which they operate.

At a more fundamental level, the study contributes to the literature on diversification by drawing conclusions from a specific case of diversification about the financial benefits or disadvantages which firms generally may derive from diversification. The non-financial companies under study in this research are engaged in a moderate amount of diversification, which in the literature is equated with related diversification, and their generally superior financial performance thus supports the theoretical arguments that firms would be expected to benefit by diversifying into related areas of activity. The study further contributes to the literature on diversification by finding evidence to support the theoretical arguments that firms engaging in related diversification would be expected to reap benefits from synergy and from a reduction in their transactions costs. The evidence collected suggests that the non-financial firms possessed superior financing structures and it was argued that these arose as a result of their diversification into financial services which placed them in an advantageous position to develop their internal capital markets and liase with external capital markets and thus increase their ability to obtain finance whilst reducing their transactions costs. Evidence of synergy emerged particularly from the SEG sample where the non-financial companies' superior IR results indicate that the combined effect of the financial services activities and the non-financial activities carried out by these companies was greater than the 'sum of the parts' as represented by the control group. It was hypothesised that the non-financial companies' advantageous financing structures which, as argued above, they developed through their diversification into financial services activities, contributed towards the creation of this synergistic effect.

Finally, the study contributes to the literature on diversification by providing evidence to support the theoretical arguments that firms' financial performance would be expected to improve as they diversify into related activities but then deteriorate as they diversify further into unrelated activities. This emerges from the finding that the non-financial companies' IR results are statistically significantly superior when their financial services segment represents around one-fifth to one-third of their total sales. However their results are worse than, or equivalent to, those of comparable companies which are not involved in financial services at diversification levels below or above

these thresholds. This evidence supports the hypothesis put forward in the literature (Rumelt (1974), Palich et al. (2000)) that firms' financial performance improves as they diversify into related activities but then deteriorates as they diversify further into unrelated activities.

The observations made above provide new insights into the relationship between diversification and financial performance and thus contribute towards resolving the unsettled state of the literature on the matter. The observations also provide important guidelines for the management of non-financial firms which have diversified, or which are considering diversifying, into the financial services industry with respect to the likely impact of such a strategy upon their firms' financial performance.

8.5 Limitations of the Study

The main limitations of this research study may be considered to be the following:

(i) as noted in Sections 4.5 and 4.8, due to data limitations firms were benchmarked on the basis of their 1998 data in this study. 1998 represents the last year of the period (1989 - 1998) under study and, given sufficient data, alternative time periods prior or subsequent to the sample firms' entry into the financial services industry could have been selected for benchmarking purposes. The approach adopted, whereby the matching process was carried out on the basis of the last year of the period under study, places limitations upon the conclusions which can be drawn from the results of the study insofar as it cannot be conclusively stated that the sample companies' financial performance during the period was affected by their diversification into the financial services industry or, conversely, that the sample companies' financial performance during the period led them to diversify into the industry.

(ii) it was pointed out in Section 5.7 that whilst the results for certain time periods as a whole are statistically significant, the results of only a few of the years within the respective time periods are significant and the results for the sample period as a whole may thus depend upon a small number of cases in particular sectors/years. It was however argued in the Section that although the results of only a few individual years in the various data sets are statistically significant, the results for the five and ten

year periods, which in several instances are statistically significant, are more appropriate indicators of the difference between the sample and match companies' share return performance than the annual results for the reasons noted in the Section.

It is however acknowledged that the identification of the factors which may have influenced the non-financial companies' results in the different countries for the time periods and sectors under study as a whole, as well as their effect in particular years and in particular sectors, represents a limitation to this study and that further research is necessary to identify the factors and to explain their effect upon the non-financial companies' results.

(iii) it was concluded from a comparison of the sample and control companies' ROA, ROIC and ROE ratios in Chapter 7 that the reasons for the sample companies' favourable financial performance in certain time periods stemmed to some extent from their advantageous financing structures. However, additional data is required to allow a further decomposition of the accounting ratios in order to identify the components of the companies' financing structures - cost of non-equity capital, proportion of non-equity capital etc. - which may have been responsible for this effect. Further information is also required to determine the extent to which the non-financial companies obtained non-equity capital from external and internal sources.

(iv) as discussed in Section 3.4, it was assumed in this Thesis that stock markets are generally efficient insofar as market prices should, particularly in the longer-term, be fair estimates of securities' true value. It was however also pointed out that the financial markets in different countries may vary in efficiency since in some countries shareholdings in companies are relatively concentrated whilst in others the capital markets are comparatively undeveloped. However, by matching the non-financial companies only with control companies from the same country it was as far as possible ensured in the study that each pair of companies was subjected to the same political, economic, business and financial environments.

8.6 Recommendations for Future Research

In order to address the limitations of this study, and to further extend the study, it is suggested that future research should be carried out in the following areas:

(i) in the SIC sample, the present study has identified 716 non-financial companies which have diversified into the financial services industry and an equal number of companies which are comparable to the non-financial companies in terms of size and market-to-book ratio but which have not diversified into the financial services industry. To partly address the limitations noted in 8.5 (i), a future study could track the financial performance of the 716 pairs of companies after 1998 to establish whether the observations made and conclusions reached in this study continue to manifest themselves in later years.

Similarly, the financial performance of the 148 pairs of companies in the SEG sample after 1998 could continue to be tracked.

(ii) with respect to the limitations noted in 8.5 (ii), further data relating to the factors which may have influenced the non-financial companies' results could be obtained in a future study to establish the effect these factors could have had in the different countries for the time periods and sectors under study as a whole, as well as their effect in particular years and in particular sectors. The factors include considerations such as the time of entry by the non-financial companies into the financial services industry, the regulatory environment existing in the different countries and fluctuations in economic activity in these countries.

(iii) to address the limitations noted in 8.5 (iii), a future study could collect more detailed data relating to the financing structures of the non-financial and control companies - cost of non-equity capital, proportion of non-equity capital etc. - to establish which factors within these structures impact most upon the non-financial companies' financial performance. Further information on the extent to which the non-financial companies obtained non-equity capital from external and internal sources should also be collected.

(iv) in the case of both (ii) and (iii), the activities of the non-financial companies whose financial services segment constitutes one-fifth to one third of their total sales should be examined in particular depth since evidence emerged in this study that these companies' financial results were significantly better than those of non-financial companies which had diversified to a lesser or greater degree into financial services activities.

(v) as discussed in Chapter 3, alternative approaches towards measuring companies' financial performance such as Economic Value Added and Shareholder Value Added have been developed in recent years and these alternative measures could be utilised in a future study to provide a further basis of comparison between the financial performance of the non-financial and control groups of companies.

GLOSSARY

List of Abbreviations used in this Thesis

CAPM	Capital Asset Pricing Model
IR	Investment Return (or Share Return)
M & A	Merger and Acquisition
Match companies	Companies making up the control group (i.e. companies which do not provide financial services)
Non-financial companies	Companies which are involved in the provision of financial services but which derive the major part of their income from other business activities
ROA	Return on Assets
ROIC	Return on Invested Capital
ROE	Return on Equity
Sample companies	Companies making up the experimental group (i.e. the non-financial companies)
SEG sample	The sample of 148 pairs of experimental and pseudo match companies. The experimental companies were chosen on the basis of their SIC codes and two control companies were identified for each experimental company on the basis of SIC code, financial and non-financial segmental sales value and geographic location
SIC codes	Standard Industrial Classification codes
SIC sample	The sample of 716 pairs of experimental and match companies. The experimental companies were chosen on the basis of their SIC codes and match companies were identified for each experimental company on the basis of SIC code, market capitalisation, market-to-book ratio and geographic location

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APPENDIX A:

INVESTMENT RETURN AND ACCOUNTING RATIOS - WORLDSCOPE

1. INVESTMENT RETURN (IR)

(Market Price Year End + Dividends Per Share + Special Dividend-Quarter 1 + Special Dividend–Quarter 2 + Special Dividend-Quarter 3 + Special Dividend-Quarter 4) / Last Year's Market Price-Year End – 1) * 100

Stock splits and stock dividends are handled by adjusting the previous years' stock-related items, making them comparable with the most current year of reporting

2. RETURN ON ASSETS (ROA)

(Net Income before Preferred Dividends +
((Interest Expense on Debt-Interest Capitalized) * (1-Tax Rate))) /
Last Year's Total Assets * 100

Standard Tax Rate Used in Calculations: 34%

In the case of Banks, customer liabilities on acceptances, such as letters of credit, are deducted from Total Assets; in the case of Insurance companies, policyholders' surplus i.e., net earnings attributable to the policyholders are added to Net Income.

3. RETURN ON INVESTED CAPITAL (ROIC)

(Net Income before Preferred Dividends + ((Interest Expense on Debt – Interest Capitalized) * (1-Tax Rate))) / (Last Year's Total Capital + Last Year's Short Term Debt & Current Portion of Long Term Debt)

Standard Tax Rate Used in Calculations: 34%

4. RETURN ON EQUITY (ROE)

(Net Income before Preferred Dividends – Preferred Dividend Requirement / Last Year's Common Equity * 100

APPENDIX B

U.S. SIC CODES – FINANCIAL SERVICES

BANKING & CREDIT

60	Depository Institutions
61	Non-Depository Credit Institutions
6712	Offices of Bank Holding Companies

BROKING

62	Security and Commodity Brokers, Dealers, Exchangers, and Services

INSURANCE

63	Insurance Carriers
64	Insurance Agents, Brokers and Service

RENTAL & LEASING

4741	Rental of Railroad Cars
6517	Lessors of Railroad Property
6519	Lessors of Real Property, not Elsewhere Classified
7352	Medical Equipment Rental and Leasing
7353	Heavy Construction Equipment Rental and Leasing
7359	Equipment Rental and Leasing, not Elsewhere Classified
7377	Computer Rental and Leasing
7513	Truck Rental and Leasing, without Drivers
7514	Passenger Car Rental
7515	Passenger Car Leasing
7519	Utility Trailer and Recreational Vehicle Rental
7841	Video Tape Rental

INVESTMENT SERVICES

6722	Management Investment Offices, Open-End
6726	Unit Investment Trust, Face-Amount Certificate Offices, and Closed-End Management Investment Offices
6733	Trusts, except Education, Religious and Charitable
6798	Real Estate Investment Trust
6799	Investors, not Elsewhere Classified

APPENDIX C: SIC SAMPLE BY COUNTRY AND FINANCIAL SIC CODE

COUNTRY	BANKING	CREDIT	BROKING	INSURANCE	RENTAL & LEASING	INVESTMENT	TOTAL	COUNTRY %
Canada	1	4	1		4	1	11	1.5%
USA	9	54	19	19	45	5	151	21.1%
Total North America	10	58	20	19	49	6	162	22.6%
Austria					4		4	0.6%
Belgium	2			3	1		6	0.8%
Denmark		2			5	1	8	1.1%
Finland			2		1	1	4	0.6%
France	2	4	3		11		20	2.8%
Germany	2	3	3		27	1	36	5.0%
Greece				1			1	0.1%
Ireland					2		2	0.3%
Israel				1		1	2	0.3%
Italy			1	3	2		6	0.8%
Netherlands			1		4		5	0.7%
Norway			1		1		2	0.3%
Portugal					1		1	0.1%
Spain		1			1		2	0.3%
Sweden		1	2		3	4	10	1.4%
Switzerland		1	1	1	5		8	1.1%
Turkey	2						2	0.3%
United Kingdom	3	7	3	10	33	5	61	8.5%
Total Europe	11	19	17	19	101	13	180	25.2%
Japan		33	2	42	68	1	146	20.4%
Hong Kong	1	8	18	1	8	30	66	9.2%
India	1	1	1	1	1	4	9	1.3%
Indonesia					3		3	0.4%
Malaysia	1	12	14	4	11	22	64	8.9%
Philippines		2	1				3	0.4%
Singapore	2	2	5	1	5	14	29	4.1%
South Korea					2		2	0.3%
Sri Lanka			1	1			2	0.3%
Taiwan			1		3	1	5	0.7%
Thailand		1			2	1	4	0.6%
Total Other Asia	5	26	41	8	35	72	187	26.1%
Australia		4	2	2	3	11	22	3.1%
New Zealand		1			1	2	4	0.6%
Total Australasia		5	2	2	4	13	26	3.6%
South Africa		3	1		3	3	10	1.4%
Brazil	1	1					2	0.3%
Chile				1	1		2	0.3%
Mexico	1						1	0.1%
Total South America	2	1		1	1		5	0.7%
Grand Total	28	145	83	91	261	108	716	100.0%
SIC CODE%	3.9%	20.3%	11.6%	12.7%	36.4%	15.1%	100.0%	

APPENDIX D: SIC SAMPLE BY COUNTRY AND PRIMARY SIC CODE

COUNTRY	AGRICULTURE, MINING ETC. SIC CODES 01 TO 17	MANUFAC-TURING SIC CODES 20 TO 39	TRANSPORT SIC CODES 40 TO 47	COMMUN-ICATIONS SIC CODES 48 TO 49	WHOLESALE & RETAIL SIC CODES 50 TO 59	SERVICES SIC CODES 65, 70-79, 87	TOTAL	COUNTRY %
Canada	1	3	1	3	1	2	11	1.5%
USA	26	53	9	15	22	26	151	21.1%
Total North America	27	56	10	18	23	28	162	22.6%
Austria	1	1	1		1		4	0.6%
Belgium			2			4	6	0.8%
Denmark		1	1		3	3	8	1.1%
Finland		3			1		4	0.6%
France	1	3	2	1	7	6	20	2.8%
Germany	1	22	2	2	5	4	36	5.0%
Greece		1					1	0.1%
Ireland	1		1				2	0.3%
Israel					1	1	2	0.3%
Italy		2	2		1	1	6	0.8%
Netherlands	1	1	1		1	1	5	0.7%
Norway	1			1			2	0.3%
Portugal		1					1	0.1%
Spain	1	1					2	0.3%
Sweden	1	6	3				10	1.4%
Switzerland		2	1		4	1	8	1.1%
Turkey		2					2	0.3%
United Kingdom	9	10	4	1	25	12	61	8.5%
Total Europe	17	56	20	5	49	33	180	25.2%
Japan	14	35	20	13	43	21	146	20.4%
Hong Kong	5	14	5	1	12	29	66	9.2%
India		4	2			3	9	1.3%
Indonesia					1	2	3	0.4%
Malaysia	13	22	3	2	10	14	64	8.9%
Philippines	1	1				1	3	0.4%
Singapore	4	8	5		4	8	29	4.1%
South Korea	2						2	0.3%
Sri Lanka			2				2	0.3%
Taiwan	1	2			1	1	5	0.7%
Thailand	1	3					4	0.6%
Total Other Asia	27	54	17	3	28	58	187	26.1%
Australia	6	6		1	6	3	22	3.1%
New Zealand		1	1		1	1	4	0.6%
Total Australasia	6	7	1	1	7	4	26	3.6%
South Africa		3	1	2	2	2	10	1.4%
Brazil		1			1		2	0.3%
Chile	1					1	2	0.3%
Mexico					1		1	0.1%
Total South America	1	1			2	1	5	0.7%
Grand Total	92	212	69	42	154	147	716	100.1%
SIC CODE%	12.9%	29.6%	9.6%	5.9%	21.5%	20.5%	100.0%	

APPENDIX E: SEG SAMPLE BY COUNTRY AND FINANCIAL SIC CODE

COUNTRY	BANKING	CREDIT	BROKING	INSURANCE	RENTAL & LEASING	INVESTMENT	TOTAL	COUNTRY %
Canada					2		2	1.4%
USA	5	20	4	5	7	1	42	28.4%
Total North America	5	20	4	5	9	1	44	29.7%
Austria					1		1	0.7%
Belgium				1			1	0.7%
Finland						1	1	0.7%
France		1			2		3	2.0%
Germany		1			16		17	11.5%
Ireland					1		1	0.7%
Italy				2	1		3	2.0%
Sweden		1	1		1	1	4	2.7%
Switzerland				1			1	0.7%
Turkey	1						1	0.7%
United Kingdom	1	5	2	3	4	1	16	10.8%
Total Europe	2	8	3	7	26	3	49	33.1%
Japan		10		1	11		22	14.9%
Hong Kong		3	5		3	6	17	11.5%
Malaysia			1		1	5	7	4.7%
Philippines		1	1				2	1.4%
Singapore	1	1				3	5	3.4%
Total Other Asia	1	5	7	0	4	14	31	20.9%
New Zealand		1					1	0.7%
South Africa		1					1	0.7%
Grand Total	8	45	14	13	50	18	148	100.0%
SIC CODE%	5.3%	30.4%	9.5%	8.8%	33.8%	12.2%	100.0%	

APPENDIX F: SEG SAMPLE BY COUNTRY AND PRIMARY SIC CODE

COUNTRY	AGRICULTURE, MINING ETC. SIC CODES 01 TO 17	MANUFAC-TURING SIC CODES 20 TO 39	TRANSPORT & COMMUN-ICATIONS SIC CODES 40 TO 49	WHOLESALE & RETAIL SIC CODES 50 TO 59	SERVICES SIC CODES 65, 70-79, 87	TOTAL	COUNTRY %
Canada		1	1			2	1.4%
USA	10	15	4	8	5	42	28.4%
Total North America	10	16	5	8	5	44	29.7%
Austria		1				1	0.7%
Belgium			1			1	0.7%
Finland		1				1	0.7%
France		1	1	1		3	2.0%
Germany		12	2	2	1	17	11.5%
Ireland			1			1	0.7%
Italy		2	1			3	2.0%
Sweden		4				4	2.7%
Switzerland					1	1	0.7%
Turkey		1				1	0.7%
United Kingdom	1	1		11	3	16	10.8%
Total Europe	1	23	6	14	5	49	33.1%
Japan	6	6	1	4	5	22	14.9%
Hong Kong	2	5	1	3	6	17	11.5%
Malaysia	1	2	1	1	2	7	4.7%
Philippines	1				1	2	1.4%
Singapore		1		2	2	5	3.4%
Total Other Asia	4	8	2	6	11	31	20.9%
New Zealand		1				1	0.7%
South Africa			1			1	0.7%
Grand Total	21	54	15	32	26	148	100.0%
SIC CODE%	14.2%	36.5%	10.1%	21.6%	17.6%	100.0%	

APPENDIX G: ANNUAL PERCENT CHANGE IN GROSS DOMESTIC PRODUCT IN CONSTANT PRICES

REGION / COUNTRY	1989	1990	1991	1992	1993	AVERAGE 1989-1993	1994	1995	1996	1997	1998	AVERAGE 1994-1998	AVERAGE 1989-1998
WORLD	3.7	2.8	1.4	2.1	2.3	2.5	3.7	3.6	4.0	4.2	2.8	3.7	3.1
ADVANCED ECONOMIES	3.9	3	1.3	2.1	1.4	2.3	3.4	2.7	3.0	3.4	2.7	3.0	2.7
DEVELOPING COUNTRIES	4.0	3.6	4.8	6.2	6.4	5.0	6.7	6.1	6.5	5.8	3.6	5.7	5.4
UNITED STATES	3.5	1.8	-0.5	3.1	2.7	2.1	4.0	2.7	3.6	4.4	4.3	3.8	3.0
EUROPEAN UNION	3.5	3.1	1.9	1.2	-0.3	1.9	2.8	2.5	1.7	2.6	2.9	2.5	2.2
UNITED KINGDOM	2.1	0.7	-1.4	0.2	2.5	0.8	4.7	2.9	2.6	3.4	3.0	3.3	2.1
GERMANY	3.6	5.7	5.0	2.2	-1.1	3.1	2.3	1.7	0.8	1.4	2.0	1.6	2.4
FRANCE	4.3	2.6	1.0	1.3	-0.9	1.7	1.8	1.9	1.1	1.9	3.5	2.0	1.9
ITALY	2.9	2.0	1.4	0.8	-0.9	1.2	2.2	2.9	1.1	2.0	1.8	2.0	1.6
JAPAN	5.4	5.3	3.0	0.9	0.5	3.0	1.0	1.4	3.6	1.8	-1.0	1.4	2.2
NEWLY INDUSTRIALISED ASIAN ECONOMIES (Korea, Hong Kong, Singapore, Taiwan)	6.5	7.1	8.0	6.2	6.5	6.9	7.7	7.5	6.3	5.8	-2.4	5.0	5.9

SOURCE:
INTERNATIONAL MONETARY FUND
WORLD ECONOMIC OUTLOOK DATABASE
DECEMBER 2001

APPENDIX H: SIC SAMPLE IR% 1989 - 1998:- UNINTERRUPTED DATA BY FINANCIAL SIC CODE

SAMPLE	Paired t-Test Uninterrupted Data								Paired t-Test Excluding Outliers								Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		W.R.	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		W.R.	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
1989 - 1998																					
BANKING & CREDIT	95	177.034	367.424	-190.387	-1.297	0.198		0.59	89	139.829	136.883	2.946	0.15	0.881		1.01	38	57	-0.869	0.385	
BROKING	29	316.607	370.168	-53.561	-0.364	0.718		0.89	25	163.981	123.829	40.152	0.733	0.471		1.18	11	18	-0.184	0.854	
INSURANCE	55	151.988	150.961	1.027	0.013	0.99		1.00	53	119.459	67.537	51.922	2.296	0.026	**	1.31	30	25	1.315	0.188	
RENTAL	101	416.243	171.439	244.805	1.468	0.145		1.90	91	101.391	75.28	26.112	1.34	0.184		1.15	57	44	1.685	0.092	*
INVESTMENT SERVICES	29	193.147	123.292	69.855	1.633	0.114		1.31	29	193.147	123.292	69.855	1.633	0.114		1.31	17	12	1.546	0.122	
TOTAL	309	265.377	242.181	23.196	0.313	0.754		1.07	287	131.371	102.034	29.337	2.537	0.012	**	1.15	153	156	1.478	0.139	
1989 - 1993																					
BANKING & CREDIT	97	82.864	97.937	-15.073	-0.672	0.503		0.92	91	66.093	64.662	1.431	0.11	0.913		1.01	45	52	-0.757	0.449	
BROKING	29	228.217	253.145	-24.928	-0.425	0.674		0.93	24	90.16	104.341	-14.181	-0.586	0.564		0.93	12	17	-0.66	0.51	
INSURANCE	55	75.301	58.459	16.842	0.534	0.595		1.11	51	40.508	24.75	15.757	1.087	0.282		1.13	31	24	1.341	0.18	
RENTAL	102	104.636	51.324	53.313	1.739	0.085	*	1.35	98	56.544	42.589	13.955	0.988	0.326		1.10	57	45	1.287	0.198	
INVESTMENT SERVICES	29	163.641	165.829	-2.188	-0.038	0.97		0.99	24	99.381	95.086	4.295	0.168	0.868		1.02	12	17	-0.443	0.658	
TOTAL	312	109.667	96.476	13.192	0.854	0.394		1.07	288	63.093	55.925	7.167	0.969	0.334		1.05	157	155	0.413	0.68	
1994 - 1998																					
BANKING & CREDIT	133	57.789	49.288	8.501	0.654	0.514		1.06	129	47.356	35.629	11.727	1.148	0.253		1.09	61	72	0.161	0.872	
BROKING	48	70.283	35.824	34.459	1.158	0.253		1.25	47	44.114	36.472	7.642	0.581	0.564		1.06	30	18	1.18	0.238	
INSURANCE	75	34.285	24.895	9.39	0.766	0.446		1.08	73	21.83	12.583	9.248	0.793	0.431		1.08	36	39	0.296	0.767	
RENTAL	174	46.239	26.224	20.015	1.578	0.116		1.16	166	20.385	4.949	15.436	2.025	0.044	**	1.15	90	84	1.344	0.179	
INVESTMENT SERVICES	58	15.993	-14.528	30.52	2.244	0.029	**	1.36	58	15.993	-14.528	30.52	2.244	0.029	**	1.36	34	24	2.11	0.035	**
TOTAL	488	46.32	28.407	17.913	2.599	0.01	***	1.14	473	29.783	15.238	14.545	3.062	0.002	***	1.13	251	237	2.051	0.04	**

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

W.R. = Wealth Relative

APPENDIX I: SEG SAMPLE IR% 1989 - 1998:- UNINTERRUPTED DATA BY FINANCIAL SIC CODE

SAMPLE	Paired t-Test Uninterrupted Data								Paired t-Test Excluding Outliers								Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		W.R.	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		W.R.	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
1989 - 1998																					
BANKING & CREDIT	31	169.1167	120.8579	48.259	1.02	0.316		1.22	30	160.982	84.658	76.324	1.939	0.062	*	1.41	20	11	1.235	0.217	
BROKING	5	412.829	346.223	66.606	0.306	0.775		1.15	5	412.829	346.223	66.606	0.306	0.775		1.15	2	3	-0.135	0.893	
INSURANCE	8	246.755	136.702	110.053	0.745	0.481		1.46	8	246.755	136.702	110.053	0.745	0.481		1.46	6	2	1.12	0.263	
RENTAL	17	274.647	70.62	204.028	1.836	0.085	*	2.20	16	173.531	66.201	107.33	1.84	0.086	*	1.65	12	5	1.87	0.062	*
INVESTMENT SERVICES	4	150.629	335.266	-184.637	-1.073	0.362		0.58	4	150.629	335.266	-184.637	-1.073	0.362		0.58	2	2	-0.73	0.465	
TOTAL	65	223.882	140.199	83.683	1.846	0.069	*	1.35	63	194.391	123.25	71.141	1.991	0.051	*	1.32	42	23	1.957	0.05	**
1989 - 1993																					
BANKING & CREDIT	31	66.419	29.429	36.99	1.99	0.056	*	1.29	31	66.419	29.429	36.99	1.99	0.056	*	1.29	20	11	1.803	0.071	*
BROKING	5	93.79	101.211	-7.422	-0.12	0.91		0.96	5	93.79	101.211	-7.422	-0.12	0.91		0.96	2	3	-0.135	0.893	
INSURANCE	8	127.041	9.321	117.72	3.498	0.01	***	2.08	8	127.041	9.321	117.72	3.498	0.01	***	2.08	8	0	2.521	0.012	**
RENTAL	17	91.988	19.591	72.398	2.81	0.013	**	1.61	17	91.988	19.591	72.398	2.81	0.013	**	1.61	14	3	2.817	0.005	***
INVESTMENT SERVICES	4	435.837	177.937	257.9	1.027	0.38		1.93	2	168.857	94.296	74.561	1.283	0.421		1.38	3	1	1.095	0.273	
TOTAL	65	105.406	39.042	66.365	3.363	0.001	***	1.48	63	86.44	31.977	54.464	4.026	0	***	1.41	47	18	3.754	0	***
1994 - 1998																					
BANKING & CREDIT	40	71.826	38.568	33.258	1.797	0.08	*	1.24	40	71.826	38.568	33.258	1.797	0.08	*	1.24	22	18	1.411	0.158	
BROKING	9	90.963	53.371	37.592	1.091	0.307		1.25	9	90.963	53.371	37.592	1.091	0.307		1.25	6	3	1.007	0.314	
INSURANCE	10	70.538	86.645	-16.106	-0.27	0.794		0.91	10	70.538	86.645	-16.106	-0.27	0.794		0.91	4	6	0.051	0.959	
RENTAL	31	44.385	28.645	15.74	0.473	0.64		1.12	30	15.921	25.901	-9.98	-0.456	0.652		0.92	12	19	-0.51	0.61	
INVESTMENT SERVICES	8	34.528	81.996	-47.468	-0.763	0.471		0.74	7	22.397	20.177	2.219	0.051	0.961		1.02	2	6	-0.98	0.327	
TOTAL	98	61.727	45.24	16.487	1.072	0.286		1.11	96	52.411	39.664	12.747	0.999	0.32		1.09	46	52	0.579	0.562	

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

W.R. = Wealth Relative

APPENDIX J: SIC SAMPLE IR% 1989 - 1998:- UNINTERRUPTED DATA BY GEOGRAPHIC LOCATION

SAMPLE	Paired t-Test Uninterrupted Data							Paired t-Test Excluding Outliers							Wilcoxon signed ranks test				
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	W.R.	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	W.R.	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
1989 - 1998																			
NORTH AMERICA	85	582.061	561.53	20.531	0.082	0.935	1.03	72	243.272	219.014	24.259	0.977	0.332	1.08	42	43	0.795	0.426	
BANKING/CREDIT/BROKING	51	359.125	666.306	-307.181	-1.157	0.253	0.60	44	237.861	247.378	-9.517	-0.351	0.727	0.97	22	29	-0.6	0.549	
INSURANCE/RENTAL/INVESTMENT	34	916.465	404.366	512.098	1.067	0.294	2.02	28	251.777	174.442	77.335	1.667	0.107	1.28	20	14	1.804	0.071	*
EUROPE	89	287.173	251.072	36.101	0.414	0.68	1.10	82	178.638	140.527	38.111	1.447	0.152	1.16	45	44	1.07	0.285	
BANKING/CREDIT/BROKING	27	166.596	298.816	-132.22	-0.777	0.444	0.67	26	166.154	137.313	28.841	0.507	0.617	1.12	12	15	-0.336	0.737	
INSURANCE/RENTAL/INVESTMENT	62	339.682	230.28	109.403	1.088	0.281	1.33	56	184.434	142.02	42.414	1.489	0.142	1.18	33	29	1.518	0.129	
JAPAN	83	-39.834	-38.137	-1.697	-0.196	0.845	0.97	83	-39.834	-38.137	-1.697	-0.196	0.845	0.97	36	47	-0.481	0.63	
BANKING/CREDIT/BROKING	28	-24.718	-19.689	-5.029	-0.214	0.832	0.94	28	-24.718	-19.689	-5.03	-0.214	0.832	0.94	8	20	-1.252	0.21	
INSURANCE/RENTAL/INVESTMENT	55	-47.53	-47.529	-0.001	0	1	1.00	55	-47.53	-47.529	-0.001	0	1	1.00	28	27	0.327	0.744	
OTHER ASIA/AUSTRALASIA/S.AFRICA	52	197.58	152.382	45.197	0.754	0.454	1.18	50	176.917	103.138	73.779	2.3	0.026	** 1.36	30	22	1.749	0.08	*
BANKING/CREDIT/BROKING	18	215.492	230.103	-14.61	-0.092	0.928	0.96	16	153.161	85.93	67.231	1.125	0.278	1.36	7	11	0.283	0.777	
INSURANCE/RENTAL/INVESTMENT	34	188.097	111.236	76.86	1.997	0.054	* 1.36	34	188.097	111.236	76.86	1.997	0.054	* 1.36	23	11	2.009	0.045	**
TOTAL	309	265.377	242.181	23.196	0.313	0.754	1.07	287	131.371	102.034	29.337	2.537	0.012	** 1.15	153	156	1.478	0.139	
BANKING/CREDIT/BROKING	124	209.679	368.066	-158.387	-1.348	0.18	0.66	114	145.126	134.021	11.105	0.572	0.568	1.05	49	75	-0.828	0.408	
INSURANCE/RENTAL/INVESTMENT	185	302.71	157.804	144.906	1.532	0.127	1.56	173	122.308	80.96	41.351	2.898	0.004	*** 1.23	104	81	2.665	0.008	***

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

W.R. = Wealth Relative

APPENDIX J (CONTINUED): SIC SAMPLE IR% 1989 - 1998:- UNINTERRUPTED DATA BY GEOGRAPHIC LOCATION

SAMPLE	Paired t-Test Uninterrupted Data								Paired t-Test Excluding Outliers								Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		W.R.	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		W.R.	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
1989 - 1993																					
NORTH AMERICA	85	134.499	125.807	8.692	0.346	0.73		1.04	76	93.601	80.429	13.172	1.114	0.269		1.07	45	40	0.743	0.458	
BANKING/CREDIT/BROKING	51	109.79	147.723	-37.932	-1.385	0.172		0.85	46	93.143	95.937	-2.794	-0.195	0.846		0.99	24	27	-0.712	0.476	
INSURANCE/RENTAL/INVESTMENT	34	171.562	92.933	78.629	1.732	0.093	*	1.41	30	94.303	56.65	37.653	1.899	0.068	**	1.24	21	13	2.043	0.041	**
EUROPE	92	101.145	96.056	5.089	0.139	0.89		1.03	88	65.746	70.263	-4.517	-0.28	0.78		0.97	43	49	-0.681	0.496	
BANKING/CREDIT/BROKING	29	42.986	105.828	-62.842	-1.35	0.188		0.69	28	45.395	69.352	-23.958	-0.903	0.374		0.86	12	17	-1.265	0.206	
INSURANCE/RENTAL/INVESTMENT	63	127.917	91.557	36.359	0.745	0.459		1.19	60	75.244	70.688	4.555	0.226	0.822		1.03	31	32	0.048	0.962	
JAPAN	83	-18.977	-14.768	-4.209	-0.492	0.624		0.95	83	-18.977	-14.768	-4.209	-0.492	0.624		0.95	42	41	0.023	0.982	
BANKING/CREDIT/BROKING	28	-12.73	-6.472	-6.258	-0.427	0.673		0.93	28	-12.73	-6.472	-6.258	-0.427	0.673		0.93	11	17	-1.161	0.246	
INSURANCE/RENTAL/INVESTMENT	55	-22.158	-18.991	-3.166	-0.298	0.767		0.96	55	-22.158	-18.992	-3.166	-0.298	0.767		0.96	31	24	1.089	0.276	
OTHER ASIA/AUSTRALASIA/S.AFRICA	52	289.492	226.835	62.656	1.244	0.219		1.19	41	166.987	122.842	44.146	1.657	0.105		1.20	27	25	1.102	0.27	
BANKING/CREDIT/BROKING	18	453.703	356.634	97.069	0.932	0.365		1.21	13	229.162	170.361	58.801	1.006	0.334		1.22	10	8	0.893	0.372	
INSURANCE/RENTAL/INVESTMENT	34	202.556	158.118	44.438	0.811	0.423		1.17	28	138.12	100.779	37.341	1.297	0.206		1.19	17	17	0.692	0.489	
TOTAL	312	109.667	96.476	13.192	0.854	0.394		1.07	288	63.093	55.925	7.167	0.969	0.334		1.05	157	155	0.413	0.68	
BANKING/CREDIT/BROKING	126	116.318	133.659	-17.341	-0.796	0.428		0.93	115	71.115	72.943	-1.827	-0.16	0.873		0.99	57	69	-0.995	0.32	
INSURANCE/RENTAL/INVESTMENT	186	105.162	71.287	33.875	1.598	0.112		1.20	173	57.759	44.613	13.146	1.356	0.177		1.09	100	86	1.474	0.141	
1994 - 1998																					
NORTH AMERICA	121	108.149	104.142	4.007	0.237	0.813		1.02	113	82.647	67.095	15.552	1.375	0.172		1.09	65	56	0.77	0.442	
BANKING/CREDIT/BROKING	73	99.493	99.238	0.255	0.014	0.989		1.00	70	91.284	75.906	15.378	1.068	0.289		1.09	38	35	0.08	0.936	
INSURANCE/RENTAL/INVESTMENT	48	121.311	111.599	9.712	0.301	0.765		1.05	43	68.586	52.751	15.835	0.856	0.397		1.10	27	21	1.036	0.3	
EUROPE	135	111.711	61.928	49.783	2.938	0.004	***	1.31	129	85.387	52.352	33.036	2.973	0.004	***	1.22	77	58	2.563	0.1	*
BANKING/CREDIT/BROKING	36	136.578	69.289	67.289	1.641	0.11		1.40	35	103.332	71.116	32.217	1.475	0.149		1.19	21	15	1.807	0.071	*
INSURANCE/RENTAL/INVESTMENT	99	102.668	59.251	43.416	2.444	0.016	**	1.27	94	78.705	45.365	33.341	2.57	0.012	**	1.23	56	43	1.909	0.056	*
JAPAN	128	-37.852	-36.09	-1.762	-0.336	0.737		0.97	128	-37.852	-36.09	-1.762	-0.336	0.737		0.97	58	70	-0.026	0.979	
BANKING/CREDIT/BROKING	33	-24.882	-14.435	-10.446	-0.645	0.524		0.88	33	-24.882	-14.435	-10.447	-0.645	0.524		0.88	15	18	-0.295	0.768	
INSURANCE/RENTAL/INVESTMENT	95	-42.358	-43.612	1.254	0.291	0.772		1.02	95	-42.358	-43.612	1.254	0.291	0.772		1.02	43	52	0.122	0.903	
OTHER ASIA/AUSTRALASIA/S.AFRICA	104	-6.9	-23.841	16.941	1.544	0.126		1.22	103	-13.802	-24.347	10.545	1.172	0.244		1.14	51	53	0.516	0.606	
BANKING/CREDIT/BROKING	39	-7.672	-25.321	17.649	0.836	0.408		1.24	38	-26.4	-26.731	0.331	0.027	0.979		1.00	17	22	-0.516	0.606	
INSURANCE/RENTAL/INVESTMENT	65	-6.437	-22.954	16.517	1.344	0.184		1.21	65	-6.437	-22.954	16.517	1.344	0.184		1.21	34	31	0.944	0.345	
TOTAL	488	46.32	28.407	17.913	2.599	0.01	***	1.14	473	29.783	15.238	14.545	3.062	0.002	***	1.13	251	237	2.051	0.04	**
BANKING/CREDIT/BROKING	181	61.102	45.718	15.385	1.243	0.215		1.11	176	46.49	35.854	10.636	1.288	0.199		1.08	91	90	0.688	0.492	
INSURANCE/RENTAL/INVESTMENT	307	37.605	18.2	19.404	2.369	0.018	**	1.16	297	19.882	3.022	16.861	2.919	0.004	***	1.16	160	147	2.061	0.039	**

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

W.R. = Wealth Relative

APPENDIX K: SEG SAMPLE IR% 1989 - 1998:- UNINTERRUPTED DATA BY GEOGRAPHIC LOCATION

SAMPLE	Paired t-Test Uninterrupted Data								Paired t-Test Excluding Outliers								Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		W.R.	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		W.R.	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
1989 - 1998																					
NORTH AMERICA	23	382.02	251.41	130.609	1.459	0.159		1.37	22	380.604	207.982	172.623	2.087	0.049	**	1.56	15	8	1.399	0.162	
EUROPE	23	232.659	141.46	91.199	1.031	0.314		1.38	22	157.211	141.467	15.744	0.326	0.748		1.07	15	8	0.852	0.394	
JAPAN	12	-16.275	-42.234	25.959	0.853	0.412		1.45	12	-16.275	-42.234	25.959	0.853	0.412		1.45	7	5	0.706	0.48	
OTHER ASIA/AUSTRALASIA/S.AFRICA	7	87.145	83.389	3.756	0.047	0.964		1.02	7	87.145	83.389	3.756	0.047	0.964		1.02	5	2	0.676	0.499	
TOTAL	65	223.882	140.199	83.683	1.846	0.069	*	1.35	63	194.391	123.25	71.141	1.991	0.051	*	1.32	42	23	1.957	0.05	**
1989 - 1993																					
NORTH AMERICA	23	119.806	50.428	69.378	2.35	0.028	**	1.46	23	119.806	50.428	69.378	2.35	0.028	**	1.46	17	6	2.22	0.026	**
EUROPE	23	89.634	33.283	56.351	3.029	0.006	***	1.42	23	89.635	33.283	56.351	3.029	0.006	***	1.42	18	5	2.737	0.006	***
JAPAN	12	-21.01	-32.123	11.112	0.604	0.558		1.16	12	-21.01	-32.127	11.117	0.604	0.558		1.16	7	5	0.863	0.388	
OTHER ASIA/AUSTRALASIA/S.AFRICA	7	326.627	142.551	184.075	1.315	0.237		1.76	5	176.15	94.94	81.21	2.409	0.074	*	1.42	5	2	1.521	0.128	
TOTAL	65	105.406	39.042	66.365	3.363	0.001	***	1.48	63	86.44	31.977	54.464	4.026	0	***	1.41	47	18	3.754	0	***
1994 - 1998																					
NORTH AMERICA	31	130.365	89.327	41.039	1.395	0.173		1.22	31	130.365	89.327	41.039	1.395	0.173		1.22	18	13	1.47	0.142	
EUROPE	35	90.787	71.212	19.575	0.613	0.544		1.11	33	65.449	56.568	8.882	0.432	0.669		1.06	17	18	0.377	0.706	
JAPAN	20	-27.58	-27.644	0.063	0.003	0.998		1.00	20	-27.581	-27.644	0.063	0.003	0.998		1.00	7	13	-0.896	0.37	
OTHER ASIA/AUSTRALASIA/S.AFRICA	12	-51.504	-22.934	-28.57	-2.061	0.064	*	0.63	12	-51.504	-22.934	-28.57	-2.061	0.064	*	0.63	4	8	-1.883	0.06	*
TOTAL	98	61.727	45.24	16.487	1.072	0.286		1.11	96	52.411	39.664	12.747	0.999	0.32		1.09	46	52	0.579	0.562	

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

W.R. = Wealth Relative

APPENDIX L: SIC SAMPLE IR% 1989 - 1998:- UNINTERRUPTED DATA BY PRIMARY SIC CODE

SAMPLE	Paired t-Test Uninterrupted Data								Paired t-Test Excluding Outliers								Wilcoxon signed ranks test				
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		W.R.	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		W.R.	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
1989 - 1998																					
AGRICULTURE, MINING ETC.	41	151.384	101.815	49.569	1.785	0.082	*	1.25	41	151.384	101.815	49.569	1.785	0.082	*	1.25	23	18	1.497	0.134	
BANKING/CREDIT/BROKING	17	251.562	151.616	99.946	1.882	0.078	*	1.40	17	251.562	151.616	99.946	1.882	0.078	*	1.40	10	7	1.633	0.102	
INSURANCE/RENTAL/INVESTMENT	24	80.424	66.539	13.885	0.501	0.621		1.08	24	80.424	66.539	13.885	0.501	0.621		1.08	13	11	0.4	0.689	
MANUFACTURING	101	429.58	395.162	34.418	0.161	0.873		1.07	90	130.616	99.656	30.959	1.542	0.127		1.16	49	52	0.747	0.455	
BANKING/CREDIT/BROKING	51	252.693	558.193	-305.5	-1.142	0.259		0.54	45	139.956	127.925	12.032	0.391	0.698		1.05	19	32	-0.591	0.555	
INSURANCE/RENTAL/INVESTMENT	50	610.005	228.871	381.135	1.149	0.256		2.16	45	121.275	71.388	49.887	1.928	0.06	*	1.29	30	20	1.684	0.092	*
TRANSPORT	28	116.402	233.393	-116.99	-0.763	0.452		0.65	26	53.242	62.98	-9.738	-0.312	0.758		0.94	13	15	-0.638	0.524	
BANKING/CREDIT/BROKING	2	-61.611	85.536	-147.147	-1.369	0.402		0.21	2	-61.611	85.536	-147.147	-1.369	0.402		0.21	0	2	-1.342	0.18	
INSURANCE/RENTAL/INVESTMENT	26	130.096	244.766	-114.67	-0.694	0.494		0.67	24	62.813	61.1	1.713	0.053	0.958		1.01	13	13	-0.267	0.79	
COMMUNICATIONS	29	152.347	146.552	5.795	0.152	0.88		1.02	29	152.347	146.552	5.795	0.152	0.88		1.02	15	14	0.357	0.721	
BANKING/CREDIT/BROKING	9	194.099	198.835	-4.736	-0.085	0.935		0.98	9	194.099	198.835	-4.736	-0.085	0.935		0.98	4	5	-0.059	0.953	
INSURANCE/RENTAL/INVESTMENT	20	133.559	123.025	10.533	0.211	0.835		1.05	20	133.559	123.025	10.533	0.211	0.835		1.05	11	9	0.485	0.627	
WHOLESALE & RETAIL	65	120.776	92.012	28.764	0.828	0.411		1.15	62	59.788	73.667	-13.878	-0.715	0.477		0.92	28	37	-0.859	0.39	
BANKING/CREDIT/BROKING	25	61.991	77.04	-15.05	-0.287	0.776		0.91	24	19.082	78.761	-59.679	-2.086	0.048	**	0.67	9	16	-1.52	0.128	
INSURANCE/RENTAL/INVESTMENT	40	157.517	101.369	56.148	1.222	0.229		1.28	38	85.497	70.448	15.049	0.598	0.554		1.09	19	21	0.094	0.925	
SERVICES	45	375.097	310.718	64.378	0.505	0.616		1.16	39	262.363	145.781	116.582	2.701	0.01	***	1.47	25	20	2.207	0.027	**
BANKING/CREDIT/BROKING	20	283.143	535.413	-252.27	-1.042	0.31		0.60	17	228.711	181.965	46.746	0.708	0.489		1.17	7	13	-0.56	0.575	
INSURANCE/RENTAL/INVESTMENT	25	448.66	130.963	317.697	3.099	0.005	***	2.38	22	288.366	117.821	170.546	3.069	0.006	***	1.78	18	7	3.377	0.001	***
TOTAL	309	265.377	242.181	23.196	0.313	0.754		1.07	287	131.371	102.034	29.337	2.537	0.012	**	1.15	153	156	1.478	0.139	
BANKING/CREDIT/BROKING	124	209.679	368.066	-158.387	-1.348	0.18		0.66	114	145.126	134.021	11.105	0.572	0.568		1.05	49	75	-0.828	0.408	
INSURANCE/RENTAL/INVESTMENT	185	302.71	157.804	144.906	1.532	0.127		1.56	173	122.308	80.96	41.351	2.898	0.004	***	1.23	104	81	2.665	0.008	***

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

W.R. = Wealth Relative

APPENDIX L (CONTINUED): SIC SAMPLE IR% 1989 - 1998:- UNINTERRUPTED DATA BY PRIMARY SIC CODE

SAMPLE	Paired t-Test Uninterrupted Data								Paired t-Test Excluding Outliers								Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		W.R.	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)		W.R.	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)	
1989 - 1993																					
AGRICULTURE, MINING ETC.	41	104.518	52.081	52.438	2.334	0.025	**	1.34	39	83.612	34.919	48.693	2.31	0.026	**	1.36	25	16	1.963	0.05	**
BANKING/CREDIT/BROKING	17	153.743	95.935	57.808	2.005	0.062	*	1.30	16	136.611	65.465	71.146	2.615	0.02	**	1.43	11	6	1.775	0.076	*
INSURANCE/RENTAL/INVESTMENT	24	69.651	21.017	48.633	1.474	0.154		1.40	23	46.743	13.67	33.073	1.088	0.288		1.29	14	10	1.057	0.29	
MANUFACTURING	102	118.518	101.129	17.389	0.531	0.597		1.09	94	64.329	59.678	4.651	0.316	0.753		1.03	54	48	0.469	0.639	
BANKING/CREDIT/BROKING	52	81.191	135.853	-54.662	-1.602	0.115		0.77	47	60.89	66.82	-5.93	-0.295	0.769		0.96	22	30	-1.384	0.166	
INSURANCE/RENTAL/INVESTMENT	50	157.338	65.015	92.323	1.678	0.1	*	1.56	47	67.768	52.535	15.233	0.704	0.485		1.10	32	18	2.09	0.037	*
TRANSPORT	28	24.086	79.35	-55.264	-1.087	0.287		0.69	27	19.01	27.986	-8.975	-0.411	0.684		0.93	10	18	-1.23	0.219	
BANKING/CREDIT/BROKING	2	51.964	23.614	28.35	0.336	0.794		1.23	2	51.964	23.614	28.35	0.336	0.794		1.23	1	1	0.447	0.655	
INSURANCE/RENTAL/INVESTMENT	26	21.942	83.638	-61.696	-1.134	0.268		0.66	25	16.374	28.335	-11.961	-0.52	0.608		0.91	9	17	-1.359	0.174	
COMMUNICATIONS	29	91.658	68.127	23.531	0.721	0.477		1.14	27	67.612	49.124	18.488	1.286	0.21		1.12	16	13	0.703	0.482	
BANKING/CREDIT/BROKING	9	158.787	87.566	71.221	0.905	0.392		1.38	8	75.402	81.207	-5.805	-0.32	0.758		0.97	4	5	0.178	0.859	
INSURANCE/RENTAL/INVESTMENT	20	61.451	59.379	2.071	0.065	0.949		1.01	19	64.331	35.615	28.717	1.534	0.142		1.21	12	8	0.821	0.411	
WHOLESALE & RETAIL	67	71.13	64.64	6.49	0.276	0.783		1.04	64	46.338	57.582	-11.244	-0.796	0.429		0.93	30	37	-0.812	0.417	
BANKING/CREDIT/BROKING	26	62.487	57.512	4.975	0.163	0.872		1.03	25	39.79	56.313	-16.523	-0.734	0.47		0.89	13	13	-0.343	0.732	
INSURANCE/RENTAL/INVESTMENT	41	76.611	69.16	7.451	0.223	0.825		1.04	39	50.535	58.395	-7.86	-0.429	0.671		0.95	17	24	-0.784	0.433	
SERVICES	45	216.531	202.702	13.829	0.256	0.799		1.05	37	96.174	91.021	5.154	0.245	0.808		1.03	22	23	-0.028	0.977	
BANKING/CREDIT/BROKING	20	233.145	290.76	-57.616	-0.67	0.511		0.85	17	84.045	123.279	-39.234	-1.41	0.178		0.82	6	14	-1.531	0.126	
INSURANCE/RENTAL/INVESTMENT	25	203.241	132.256	70.985	1.04	0.309		1.31	20	106.484	63.602	42.883	1.484	0.154		1.26	16	9	1.386	0.166	
TOTAL	312	109.667	96.476	13.192	0.854	0.394		1.07	288	63.093	55.925	7.167	0.969	0.334		1.05	157	155	0.413	0.68	
BANKING/CREDIT/BROKING	126	116.318	133.659	-17.341	-0.796	0.428		0.93	115	71.115	72.943	-1.827	-0.16	0.873		0.99	57	69	-0.995	0.32	
INSURANCE/RENTAL/INVESTMENT	186	105.162	71.287	33.875	1.598	0.112		1.20	173	57.759	44.613	13.146	1.356	0.177		1.09	100	86	1.474	0.141	
1994 - 1998																					
AGRICULTURE, MINING ETC.	62	31.091	12.837	18.253	1.366	0.177		1.16	62	31.091	12.837	18.253	1.366	0.177		1.16	27	35	0.193	0.847	
BANKING/CREDIT/BROKING	27	47.427	23.905	23.522	1.059	0.299		1.19	27	47.427	23.905	23.522	1.059	0.299		1.19	11	16	0.12	0.904	
INSURANCE/RENTAL/INVESTMENT	35	18.488	4.299	14.189	0.855	0.399		1.14	35	18.488	4.299	14.189	0.855	0.399		1.14	16	19	0.197	0.844	
MANUFACTURING	154	53.157	54.178	-1.021	-0.079	0.937		0.99	147	34.988	24.903	10.086	1.223	0.223		1.08	79	75	0.383	0.701	
BANKING/CREDIT/BROKING	70	68.045	64.814	3.23	0.188	0.851		1.02	68	61.841	44.726	17.114	1.445	0.153		1.12	37	33	0.6	0.549	
INSURANCE/RENTAL/INVESTMENT	84	40.75	45.314	-4.563	-0.24	0.811		0.97	79	11.875	7.839	4.036	0.351	0.727		1.04	42	42	-0.009	0.993	
TRANSPORT	51	47.216	10.161	37.054	1.699	0.096	*	1.34	50	28.334	7.32	21.014	1.394	0.17		1.20	29	22	1.406	0.16	
BANKING/CREDIT/BROKING	6	49.197	9.487	39.709	0.524	0.623		1.36	6	49.197	9.487	39.709	0.524	0.623		1.36	3	3	0.314	0.753	
INSURANCE/RENTAL/INVESTMENT	45	46.952	10.251	36.7	1.601	0.117		1.33	44	25.489	7.024	18.465	1.299	0.201		1.17	26	19	1.371	0.17	
COMMUNICATIONS	34	44.602	35.948	8.654	0.703	0.487		1.06	34	44.602	35.948	8.654	0.703	0.487		1.06	18	16	0.231	0.817	
BANKING/CREDIT/BROKING	11	70.417	56.546	13.871	0.489	0.636		1.09	11	70.417	56.546	13.871	0.489	0.636		1.09	6	5	0.267	0.79	
INSURANCE/RENTAL/INVESTMENT	23	32.255	26.097	6.159	0.487	0.631		1.05	23	32.255	26.097	6.15	0.487	0.631		1.05	12	11	0.304	0.761	
WHOLESALE & RETAIL	101	26.398	6.698	19.699	1.408	0.162		1.18	98	5.38	2.859	2.521	0.258	0.797		1.02	50	51	0.669	0.503	
BANKING/CREDIT/BROKING	34	39.058	26.924	12.134	0.4	0.692		1.10	33	18.908	26.884	-7.976	-0.341	0.735		0.94	19	15	0.35	0.726	
INSURANCE/RENTAL/INVESTMENT	67	19.973	-3.566	23.539	1.612	0.112		1.24	65	-1.489	-9.338	7.849	0.891	0.376		1.09	31	36	0.381	0.703	
SERVICES	86	68.602	26.815	41.787	2.005	0.048	**	1.33	82	43.366	10.766	32.601	2.407	0.018	**	1.29	48	38	1.996	0.046	**
BANKING/CREDIT/BROKING	33	79.338	45.397	33.941	0.8	0.429		1.23	31	32.348	34.109	-1.762	-0.108	0.914		0.99	15	18	-0.134	0.893	
INSURANCE/RENTAL/INVESTMENT	53	61.918	15.246	46.672	2.171	0.035	**	1.40	51	50.064	-3.424	53.488	2.825	0.007	***	1.55	33	20	2.474	0.013	**
TOTAL	488	46.32	28.407	17.913	2.599	0.01	***	1.14	473	29.783	15.238	14.545	3.062	0.002	***	1.13	251	237	2.051	0.04	**
BANKING/CREDIT/BROKING	181	61.102	45.718	15.385	1.243	0.215		1.11	176	46.49	35.854	10.636	1.288	0.199		1.08	91	90	0.688	0.492	
INSURANCE/RENTAL/INVESTMENT	307	37.605	18.2	19.404	2.369	0.018	**	1.16	297	19.882	3.022	16.861	2.919	0.004	***	1.16	160	147	2.061	0.039	**

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

APPENDIX M: SEG SAMPLE IR% 1989 - 1998:- UNINTERRUPTED DATA BY PRIMARY SIC CODE

SAMPLE	Paired t-Test Uninterrupted Data							Paired t-Test Excluding Outliers							Wilcoxon signed ranks test			
	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	W.R.	N	SAMPLE MEAN	MATCH MEAN	DIFF.	t-value	t-prob (2-tailed)	W.R.	SAMPLE >MATCH	SAMPLE <MATCH	Z-value	Prob. of Z (2-tailed)
1989 - 1998																		
AGRICULTURE, MINING ETC.	8	202.314	65.382	136.932	1.625	0.148	1.83	8	202.314	65.382	136.932	1.625	0.148	1.83	7	1	1.96	0.05 **
MANUFACTURING	27	222.285	181.153	41.132	0.677	0.504	1.15	26	214.943	141.703	73.24	1.367	0.184	1.30	18	9	1.009	0.313
TRANSPORT & COMMUNICATIONS	4	204.485	183.631	20.853	0.231	0.832	1.07	4	204.484	183.631	20.853	0.231	0.832	1.07	2	2	0	1
WHOLESALE & RETAIL	15	233.679	148.112	85.567	0.628	0.54	1.34	14	115.191	148.598	-33.407	-0.467	0.648	0.87	9	6	0.454	0.65
SERVICES	11	237.181	67.504	169.677	1.509	0.162	2.01	11	237.182	67.504	169.677	1.509	0.162	2.01	6	5	1.245	0.213
TOTAL	65	223.882	140.199	83.683	1.846	0.069 *	1.35	63	194.391	123.25	71.141	1.991	0.051 *	1.32	42	23	1.957	0.05 **
1989 - 1993																		
AGRICULTURE, MINING ETC.	8	115.733	-3.488	119.221	2.55	0.038 **	2.24	8	115.733	-3.488	119.221	2.55	0.038 **	2.24	7	1	2.38	0.017 **
MANUFACTURING	27	64.203	38.614	25.589	1.515	0.142	1.18	27	64.203	38.614	25.589	1.515	0.142	1.18	20	7	1.682	0.093 *
TRANSPORT & COMMUNICATIONS	4	151.034	61.393	89.641	0.791	0.487	1.56	4	151.034	61.393	89.64	0.791	0.487	1.56	2	2	0.365	0.715
WHOLESALE & RETAIL	15	112.729	53.448	59.281	2.388	0.032 **	1.39	15	112.729	53.448	59.281	2.388	0.032 **	1.39	11	4	2.158	0.031 **
SERVICES	11	172.453	43.248	129.205	1.428	0.184	1.90	9	54.594	-5.269	59.864	2.338	0.048 **	1.63	7	4	1.6	0.11
TOTAL	65	105.406	39.042	66.365	3.363	0.001 ***	1.48	63	86.44	31.977	54.464	4.026	0 ***	1.41	47	18	3.754	0 ***
1994 - 1998																		
AGRICULTURE, MINING ETC.	16	38.744	24.232	14.512	0.607	0.553	1.12	16	38.744	24.232	14.512	0.607	0.553	1.12	6	10	0.103	0.918
MANUFACTURING	39	96.461	67.52	28.94	1.256	0.217	1.17	38	95.856	55.752	40.104	1.937	0.06	1.26	22	17	1.326	0.185
TRANSPORT & COMMUNICATIONS	5	9.439	65.81	-56.372	-1.302	0.263	0.66	5	9.439	65.81	-56.372	-1.302	0.263	0.66	1	4	-1.483	0.138
WHOLESALE & RETAIL	21	62.285	32.939	29.347	0.615	0.546	1.22	20	20.485	29.037	-8.552	-0.28	0.782	0.93	10	11	0.295	0.768
SERVICES	17	18.363	23.041	-4.678	-0.144	0.887	0.96	17	18.363	23.041	-4.678	-0.144	0.887	0.96	7	10	-0.402	0.687
TOTAL	98	61.727	45.24	16.487	1.072	0.286	1.11	96	52.411	39.664	12.747	0.999	0.32	1.09	46	52	0.579	0.562

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

W.R. = Wealth Relative