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**A STUDY OF THE RELATIONSHIP BETWEEN
CONTROL AND PERFORMANCE OF
CANADIAN CORPORATIONS**

By

AJIT TULPULE, B.COM., A.C.A.

**A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of
Master of Management Studies**

School of Business

**Carleton University
Ottawa, Ontario**

September 23 1994

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A STUDY OF THE RELATIONSHIP BETWEEN
CONTROL AND PERFORMANCE OF
CANADIAN CORPORATIONS

submitted by Ajit Tulpule, B.Com., A.C.A.
in partial fulfilment of the requirements for
the degree of Master of Management Studies

Thesis Supervisor

Director, School of Business

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September 23, 1994

A B S T R A C T

This study examines the relationship between corporate control, and the stock market performance of Canadian firms included in the TSE 300 Composite Index. The portfolio approach was employed for statistically testing the relationship. Corporate control was measured by the ownership concentration of the firm, and performance by the risk adjusted monthly excess returns. Substantive testing procedures were carried out, controlling for industry, size, and other known stock market anomalies. Non-manufacturing firms were observed to outperform manufacturing firms, and also the market. The performance of manufacturing firms was found to be positively related to the firm size, and a somewhat convex relationship between performance and corporate control was observed. For non-manufacturing firms, a tilde shaped relationship was observed between size and performance. It was observed that the nature of the relationship between control and performance is, to a large extent sensitive to the measure of control, and to the time period under study. Results of earlier studies, which have used cross-sectional data, should thus be used with caution.

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Ajit Tulpule

September 23, 1994.

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1. INTRODUCTION

The separation of ownership from the management of a commercial enterprise has been the central topic of many theories and research studies in finance and economics. Modigliani and Miller's seminal work brought out the irrelevance of the capital structure as regards the cost of capital to the firm.

The problems associated with the separation of ownership from the management of the firm, and the conflict of interests between the owners and the managers, led Jensen and Meckling (1976) to formulate the agency theory. This was followed by substantial empirical research, in the US and in Canada, to investigate the determinants and consequences of the ownership structure, as also the relationship between ownership structure and firm characteristics such as size, leverage, research and development expenditure, etc. The substantial increase in mergers and take-overs in the US in the 80s prompted significant research being conducted about the ownership structure of firms and the possibility of take-overs.

However, one area which has not received much attention of researchers is the relationship between ownership concentration and corporate performance. The existing research comprises mainly of American studies testing the cross-sectional relationship between ownership and corporate performance, as measured by accounting measures or Tobin's Q. While the cross-sectional analyses do not test the stability of the results over

time, the measures of performance used in the studies (accounting measures or Tobin's Q) do have their own limitations. Also, it is noted that many studies in finance which are carried out using American data have either been replicated using Canadian data, or are complemented by further studies focusing on the Canadian markets¹. However, this is not true of the research studying the relationship between a company's performance and its ownership structure. Canadian corporations have not yet been studied in this respect.

Further, as acknowledged by Jensen and Warner (1988), "The precise effects of stock holdings by managers, outside shareholders, and institutions are not well understood, and the inter-relationships between ownership, firm characteristics, and corporate performance require further investigation". Similarly, Jog and Schaller (1989) assert that "a lot needs to be known before any direct connection can be made between the ownership structure and the market value of equity".

This paper reports the findings of a study of the relationship between corporate control (as measured by the ownership concentration of the firm) and performance of Canadian firms listed on the Toronto Stock Exchange (TSE) (as measured by the risk-adjusted excess returns). The portfolio approach was employed for statistically examining the relationship between corporate control and the stock market performance of Canadian firms. Substantive sensitivity testing procedures were carried out, controlling for industry,

¹ Many studies pertaining to the asset pricing models and anomalies (time related and size related anomalies), returns behaviour and systematic trading patterns have been replicated using Canadian data (Robinson and Smuth (1993)).

and the size of the firms, as well as time related stock market anomalies. The robustness of the results to the periodicity of portfolio revision was verified.

It should be noted that the study has not only focused on Canadian data, but has also adopted more appropriate measures of ownership structure and performance. Time series data spanning 14 years (1978 - 1991 inclusive) was used, instead of the cross-sectional data used in previous studies. It has thus been the endeavour of this study to address the shortcomings of existing research, and substantially add to the current knowledge about the Canadian capital markets.

It was found that while non-manufacturing firms outperformed manufacturing firms in the overall period 1978-91, during the sub-period 1978-81, it was the manufacturing firms that performed better than the non-manufacturing firms. The overall better performance of non-manufacturing firms can be attributed mainly to the period 1982-86. The relationship between control and performance was observed to be sector specific, and also sensitive to the time period under study and the periodicity of portfolio revision.

The findings of the study suggest important strategies for portfolio management, and also point out that considerable further research is required before any definitive comments can be made about the nature of relationship between control and performance. In this, the study has definitely added value both for portfolio managers and academics

and researchers.

The remainder of the paper is organized as follows : Section 2 reviews the previous research, and Section 3 presents the research questions, the hypotheses and the model. In Section 4 the data is described, and in Section 5 the methodology adopted by the study is presented. The findings of the study are reported in Section 6, and the implications as also the limitations are discussed in Section 7. Conclusions and ending remarks are presented in Section 8.

2. PREVIOUS RESEARCH

The existing research can be reviewed broadly under two rubrics : Theoretic research and Empirical Research.

2.1 Theoretic Research

a) Agency Theory : Different theories have been put forward, for explaining the relationship between corporate performance and ownership, the most notable among them being the agency theory. In 1932, Berle and Means demonstrated the separation of ownership from control of the firm. They noted that as corporations became larger, stockholdings became diffused. When share ownership is too dispersed, the owners are not in a strong position to control the corporation and to enforce value maximization. When managers own little equity in the firm, and the ownership is diffused, (i.e., when

ownership and management are separated), corporate assets may be put to the benefit of the managers instead of the owners, thereby creating a potential for conflicts of interest between ownership and management. Jensen and Meckling (1976) further formalize the theory, and expostulate that the performance of corporations may be positively related to the ownership concentration of the firm. Recognizing that "most corporations are simply legal fictions which serve as a nexus for a set of contracting relationships among individuals", they explain that the relationship between the shareholders and the managers is that of principal and agent. The managers act as agents of the shareholders (the principals), and strive to maximize the shareholders' interests. However, the managers, by the virtue of their position in the company, also have a personal interest which they may want to satisfy. There is hence a conflict of interest between the owners and the managers. When both parties are "utility maximizers, then there is good reason to believe that the agent will not always act in the best interests of the principal". Reviewing the existing literature, Jog and Schaller (1989) summarize four sources of conflict between management and owners - the first source arising from the management's tendency to "consume some of the firm's resources by way of perquisites". The second source of conflict arises from the fact that managers have a greater incentive to shirk their responsibilities as their equity interest in a firm falls. Thirdly, the managers may forgo profitable but risky projects, as they bear the cost of failure more than the widely diversified shareholders, and the fourth conflict may result from the managers misrepresenting the quality of future investment projects, thereby causing the outside investors to demand a higher risk premium.

In order to ensure that the agents act in the best interest of the principals, the principals (owners) incur certain "costs". These may be by way of payment of incentives to the manager, as also expending monitoring costs to "limit the aberrant activities of the [managers]". Jensen and Meckling (1976) identify three components of these "agency costs" - (1) the monitoring expenditures by the principals, (2) the bonding expenditure by the agent ² and (3) the residual loss ³.

b) Alignment - Entrenchment Hypotheses. : It is these agency costs, resulting from the conflict between ownership and managerial performance, which provide an explanation of the relationship between corporate ownership and managerial performance. It is argued that one way of reducing this conflict, (and thereby the agency costs) would be to have the managers own a substantial portion of the company's shares. This would automatically align the managers' interests with those of the owners, thus ensuring that the managers act in the best interest of the owners. Higher the managerial ownership, lower would be the agency costs, and better the performance of the firm.

Another theory, which is complementary to the agency theory, is the

² costs paid by the agent in order to guarantee the principal that the agent will not take certain actions which would be detrimental to the principal's interests.

³ the dollar equivalent of the reduction in welfare experienced by the principal due to the divergence between the agent's decision and those decisions which would maximize the principal's interests.

"entrenchment theory". Jensen and Ruback (1983) in their review of the literature pertaining to this theory, view the market for corporate control as "an arena in which management teams compete for the rights to manage the firm". A less than adequate performance by a management team results in either the team being replaced by a better performing team, or even in a take-over bid which will eventually replace the management. This notion of external discipline induces managers to always act in the best interest of the owners, and in this way helps align the interests of the managers with those of the owners.

According to these theories, one would expect to find a positive relationship between corporate control and managerial performance : higher the management's stake in the ownership of firm, better would be the performance.

c) Alternative Mechanisms : Other theories however contend that ownership of the firm and its performance are unrelated. Although the conflict between owners and managers may exist, there are other mechanisms which effectively resolve the conflict and align the interests of the owners and managers. Such alternative mechanisms include external monitors (auditors, bankers, institutional investors), performance related compensation schemes , and the existence of an efficient (managerial) labour market, a competitive product market, or large shareholder blocks.

Fama (1980) submits that an operationally efficient labour market would help align

the interests of the managers with those of the owners. He views large corporations as a "nexus of contracts" among factors of production. The managers manage the firm, but do not own it. They are aware that in case their actions deviate from those demanded by the shareholders, they may lose their job (ie. they may be replaced). An efficient labour market will immediately react to this, thereby adjusting the salary of the management downward. It would thus be in the interests of the management to act in the best interest of the owners. Fama's argument is thus based upon the existence of an efficient labour market (which would penalize inefficient managers), and the possibility that the owners would detect the managers' actions.

Hart (1983) argues that "competition in the product market reduces managerial slack.. Suppose that there is a common component to firms' costs ie., as one firm's costs (total and marginal) fall, profit-maximizing firms expand. This reduces product prices and gives the manager of the non-profit-maximizing firm less opportunity for discretionary behaviour than if his firm's costs had fallen alone and product prices had not changed. Hence average managerial slack is lower under competition than if there is a single non-profit-maximizing monopolistic firm". Thus, a competitive product market would help tackle the agency problem.

Demsetz (1983) argues that a diffused ownership does not necessarily imply reduction of firm value. He submits that the owners will not vest control in those with dis-similar interests, and that although a diffused ownership involves higher monitoring

costs, it may also reduce the capital costs, thereby offsetting the excess monitoring costs. He thus concludes that ownership and performance are unrelated.

Stiglitz (1985) shows that concentrated equity holders (i.e., large block shareholders) have more effective control over the management. He argues that "if there are few shareholders, each of whom has enough stake in the firm that his private incentives for controlling the managers are sufficiently great, then there will be a sufficiently large expenditure on information acquisition by these individuals that effective control will be exerted". Shleifer and Vishny (1986) further add that if the management is found to be inefficient, the large block owners can replace it, or facilitate third party take-overs. Although the concentrated equity owners do not necessarily have to oust the management, their potential of doing so will significantly influence the management.

According to these theories, the alternative mechanisms will effectively counter the agency problem, and so the performance of a firm and its ownership structure would be unrelated.

c) Other Theories : In contrast to the above mentioned theories, Mueller (1986) postulates that corporate ownership and performance are negatively related. He argues that even if the management's ownership is fairly large, the management may still divert funds for their personal use, provided the benefits of such diversion are greater than the costs of receiving less returns from its ownership of the firm.

On the other hand, Stulz (1988) argues that the firm value would increase as the managerial ownership increased, but decrease after the "insiders" own a large portion of the shareholders equity. He shows that in the context of a possible tender offer, the managerial ownership affects both the probability of a take-over bid, and the premium. When managers do not own any equity in the firm, the offer premium is small. As managerial ownership increases from zero, the premium offered will also increase. However, very high managerial ownership will in fact be an impediment in the take-over attempt, thereby reducing the firm value. Stulz thus predicts a convex relationship between firm value and managerial ownership, thereby implying that there may exist a certain level of insider ownership at which firm value is maximized.

Chart I shows the graphic representation of the relationship between firm performance and ownership structure, as suggested by the theoretic research.

CHART I

Relationship between Firm Performance and Ownership Structure
As suggested by Theoretic Research

JM = Jensen and Meckling

M = Muellar

S = Stulz

2.2 Empirical Research

In order to test the relationship between ownership and performance as evidenced by empirical data, many researchers have conducted analyses of the performance / ownership data of firms. Their findings are summarized in Insert A.

Demsetz and Lehn (1985) examine the effect of ownership concentration on the firm's accounting rate of return among 511 large US firms (in the Fortune 500 listing for 1981). They find that there is no significant relationship between the ownership concentration and accounting profit rates. Similarly, Holderness and Sheehan (1988), who examine the role of majority shareholders in 114 publicly held corporations listed on the NYSE or AMEX (1980-84), are unable to find any significant differences in Tobin's Q of firms having majority shareholders and those not having majority shareholders.

Using Tobin's Q as a proxy for firm performance, Morck, Schleifer, and Vishny (1988) (MSV) test the relationship between a firm's market value and equity holdings of the directors (of 371 firms listed on the NYSE in the year 1980). They report that Tobin's Q increases as board ownership increases from 0 to 5 %, drops as ownership further increases from 5 to 25 %, and rises again as board ownership increases more than 25 %⁴.

⁴ A similar relationship is observed by Wruck (1989), who examines the relationship between a change in firm value and a change in ownership concentration. "The effect on firm value of the increase (in ownership concentration) is positive on the average, but while it appears that block holders serve as catalysts that align managerial and shareholder interests, in some cases they serve as impediments to the alignment of interests".

MSV suggest an interpretation of the findings which is consistent with both the alignment and entrenchment hypotheses : the initial rise in Q as ownership rises might reflect managers' greater incentives to maximize value as their stakes rise. Beyond the 5% ownership level, however, increases in managerial ownership may be associated with conditions conducive to the entrenchment of incumbent management. Throughout this range, the incentive (alignment) effect, though present, is dominated by the entrenchment effect. As the board ownership reaches 25%, managements with even higher board ownerships might not be significantly more entrenched than those with 25% ownership. With a 25 to 30% ownership, the board may be effectively free to reject any outside challenge. The alignment effect thus overshadows the entrenchment effect in the $> 25\%$ range.

Neun and Samterre (1986) examine the relationship between a firm's profitability (measured by the net profit to sales ratio) and its "dominant stock ownership" (DSO). (A "dominant stock owner" is a single owner with the largest share of common stock). They find that there is an S shaped relationship between the net profit ratio and the percentage of shares held by the dominant shareholder - when DSO is low, the firm's profit is low. As DSO increases the profit rate increases, and this increase tapers off after the dominant stock owner has achieved majority control.

INSERT A

Summary of empirical research.

Authors	Year	Performance	Ownership	Finding
Vance	1955	Net Income	Directors' shareholding	+ve relationship
Pfeffer	1972	Profit Margin, ROE	Managerial Shareholding	+ve relationship
Demsetz & Lehn	1985	ARR / BV	Top 5 shholders' holdings	No relationship
Neun & Samterre	1985	Net Profit Margin	Dominant Stock Ownership	S Shaped relationship
Morck, Schleifer & Vishny	1988	Tobin's Q	Directors Shareholdings	increase, fall, increase
Holderness & Sheehan	1988	ARR, Tobin's Q	Majority Shareholding	No conclusions
Kim & Lyn	1988	Tobin's Q	Insider Ownership	+ve relationship
Wruck	1989	Firm Value	Insider Ownership	increase, fall, increase
Chen, Hexter, & Hu	1990	Tobin's Q	Manergerial Ownersuip	Large firms : +ve Small firms : no relationship
Oswald & Jahera	1991	Excess Stock Returns	Directors' & Officers' Shareholdings	+ve relationship

MSV's observations are confirmed by Chen, Hexter and Hu (1990), who, using a similar performance measure on firms listed in S&P's Compustat Database (1975-85), find that in the case of large "Fortune 500" firms, Q initially increases, then levels off and eventually decreases. For small firms however, no significant relationship is observed.

Oswald and Jahera (1991) recognize that, as suggested by both the finance and economics literature, the non-market (e.g., accounting) performance measures are not adequate indicators of a firm's true performance. Their view is that given the peculiarities of accounting practices, it would be possible for two identical firms to report different accounting earnings simply due to differences in accounting policies. Furthermore, they feel that the stock market provides the best measure of a firm's worth : a firm is worth only what the market is willing to pay for it. They however also recognize that consideration of stock rates of return alone does not allow for comparisons, since a high risk firm would be expected to demonstrate a higher rate of return, *ceteris paribus*. They hence use excess stock returns as a risk-adjusted performance measure. Using the Scholes and Williams (1977) technique for determining excess stock returns (as done by Wruck (1989)), they examine the relationship between the ownership structure, size, and performance of 645 firms listed on the NYSE and AMEX between 1982 and 1987. They find that both size and ownership are statistically significant factors in explaining the performance of a firm. Oswald and Jahera's observations seem to corroborate with those

of Vance (1964), Pfeffer (1972), and Kim and Lyn (1988)⁵.

Chart II shows the graphic representation of the relationship between firm performance and ownership structure as evidenced by empirical research.

2.3 Observations

The review of the previous research presented in this section reveals the following-

a) No empirical study of Canadian Data : Most of the existing research has been conducted using American data. Few longitudinal studies have been carried out using Canadian data. Quite often, results of studies of American stock markets are applied to Canada, but it is not really very clear whether such generalizations can be made, especially considering the differences that exist between the American and Canadian corporations and the legal environment. As noted by Morck and Stageland (1991), there are some conspicuous differences between American and Canadian companies. On comparing the top 50 Canadian firms with the top 50 American firms (using Canadian data from FP500 and the Globe & Mail Infoglobe databases, and American data from the Fortune 500 and Spectrum databases), they observe that large Canadian firms are much more closely held than large US firms. They also find that while Canadian firms in general trail their US rivals in profitability, they appear to be growing faster than

⁵ Vance found that Net Income was positively related to the directors' shareholdings (of companies listed on the NYSE and AMEX). Similarly, Pfeffer reports a positive relationship between managerial shareholding and the Return on Equity as well as the Net Profit margin. Using the ANOVA approach, Kim and Lyn investigate the relationship between a firm's insider ownership and its Tobin's Q. They find that Q increases with increase in insider ownership.

comparable American firms. Although the authors have presented a descriptive comparison of American and Canadian corporations, they have not performed any statistical testing of any significant difference / relationships between the firm characteristics of American and Canadian companies. Their work hence does not offer any insights about the relationship between firm performance and the ownership structure. Thus, considering the fact that both American as well as Canadian stock markets are fairly active and somewhat similar, and noting the above differences between US and Canadian companies, it will be of significant interest to know more about the relationship between performance and ownership of Canadian corporations.

b) Diverse measures of firm performance and ownership : Different researchers have used different measures of performance and ownership in their analyses. While some researchers have used accounting ratios (notably the accounting rate of return), others have used Tobin's Q, and net profit margin as measures / proxies of performance. Similarly, in the case of ownership, some studies have examined the ownership of the board of directors, while others have looked at managerial ownership as measures of corporate ownership / control. Thus, diverse measures of both performance and ownership have been used in the existing empirical research.

c) Snapshots : Most of the studies are cross-sectional in nature, and provide only a snapshot analysis (at one point in time). Such analyses do not reveal how strongly the results would hold over a (given) period of time. It is thus noted that few longitudinal studies have been conducted.

d) Summary : To summarize the theoretic arguments and the empirical evidence, it can be said that the firm performance may depend upon its ownership structure (as a manifestation of the agency problem), but no unambiguous statements can be made, either about the importance or of the nature of the dependency.

CHART II

Relationship Between Firm Performance and Ownership Structure
As Evidenced By Empirical Research

3. RESEARCH QUESTIONS, HYPOTHESES AND MEASURES

3.1 Research Questions

The review of existing literature presented in Section 2 shows that the following questions still remain, to a large extent, unanswered -

Q1> Is there any relationship between the performance of Canadian corporations and their ownership structure ? If so, what is the nature of such relationship ? Do other factors, like the size of the firm , have any intervening influence in the control-performance relationship ?

Looking at the practical implications, the above question could be stated in other words as -

Q2> Controlling for known anomalous effects such as the size effect and the January effect, would companies which are closely held perform better than those that are widely held ? Would an investor be better off (worse off) investing in shares of widely held companies as opposed to closely held companies ? In other words, "Does the ownership concentration of firms provide any basis for a portfolio management strategy ?"

This study addresses the above questions in a Canadian context. The relationship between corporate ownership and performance is examined, using the ownership and performance data of Canadian companies listed on the TSE 300 Composite Index, spanning a period of 14 years from 1978 to 1991 inclusive. In addition, this study also

attempts to investigate whether this relationship is affected by two other potential confounding factors, namely the size (market capitalization) of the firm in question, and the January effect.

3.2 Hypotheses

The study tests the null hypothesis that the performance of a firm is not related to its ownership / control structure, *ceteris paribus*. The alternative hypothesis is that performance of a company is related to its ownership structure, *ceteris paribus*.

3.3 Measures

a) Measure of Performance : As noted earlier, diverse measures of performance have been used by researchers in finance, including Accounting Rate of Return (ARR), Tobin's Q and the risk adjusted stock return. While the appropriateness of ARR as a measure of performance is open to question (due to the peculiarities of accounting practices), it is practically difficult to use Tobin's Q as a performance measure in Canada. This is because it is quite difficult to compile Tobin's Q (the ratio of a firm's market value to the replacement cost of its physical assets) for Canadian companies, as the data about the replacement cost of the assets is not very easily available. Furthermore, the market value of the long term debt (which is a component of the total market value) of a firm can, at best, only be estimated. Thus, with an estimated numerator and an estimated denominator, the reliability of the resultant measure (Q) is in question.

In keeping with Oswald and Jahera (1991), who submit that the stock market provides the best measure of a firm's worth, this study used the stock market return as a measure of performance. The return was adjusted for risk, using the Scholes-Williams (1977) technique. Also, as the study employed the portfolio approach for the analysis, the excess portfolio return (i.e. the return on the portfolio less the risk-free return [as proxied by the 90-Day Treasury Bill (T Bill) rate]) served as a measure of performance in the study.

b) Measure of "Control" : "Control" (i.e. How closely held [concentrated control] or widely held [diffused control] is a company) was measured by the percentage of the outstanding equity of the firm, which is tradeable on the stock exchange. A firm whose entire outstanding equity is tradeable on the stock exchange is considered to be with very diffused control, while a firm having a very small portion of its outstanding equity tradeable is considered to be one with very concentrated control.

c) Measure of Size : Many researchers have observed that the (risk-adjusted) return realized by an investment in firms having a small market capitalization is significantly larger than that realized by an investment in firms having a large market capitalization. This effect, called the size effect or the small firm effect, was documented in the American stock markets as well as the Canadian stock markets.⁶ In order to control for

⁶ Banz (1981) was the first to document the size effect, for the period 1931 to 1975. Reinganum (1981, 1982) found that portfolios of small firms had substantially higher returns, on average, than did larger firms. Morgan et al (1983), and Hatch and White (1985), as also Berges McConnel and Schlarbaum (1984) document this effect in the Canadian context.

this known size effect, the study incorporated a size variable in the model. As is well accepted in financial research, the study measured the size of a firm by its market capitalization.

4. THE DATA

This study used the ownership and performance data of companies included in the Toronto Stock Exchange 300 Composite index (TSE300), between 1978 and 1991 (both inclusive).

4.1 The TSE 300 Composite index : The TSE 300 Composite index ("the index") basically includes companies listed on the Toronto Stock Exchange, and which meet certain inclusion criteria. Thus a stock may be included ("listed") in the index in a given year, be delisted for some time (due to it not meeting the set criteria during that period of time) and again be listed when the criteria are met. The constituency of the index is thus fluid, and may change from one month to another.

4.2 Data Sources

a) Stock Returns Data (re : performance measure) : were drawn from the Toronto Stock Exchange / University of Western Ontario (TSE/Western) database, which is modeled after the University of Chicago Center for Research in Security Prices (CRSP) database.

The database consists of detailed stock information (including price and returns indices) of over 4000 Canadian companies dating back to 1950. However, comprehensive data on all listed stocks is available only from 1978 onwards. The study hence spans across the period of 14 years from 1978 to 1991, using monthly data for the analysis.

b) Data to construct measures of control and size : The weight which individual stocks bear on the TSE300 (used to compute the market capitalization as a measure of size), and the percentages indicating the available float on which relative weights in the index are calculated (used to compute the ownership concentration) were obtained from the index listing published in the TSE Review. The values are as of the close of December 31 for each year.

4.3 Creation of the Data Set

The data set used in the study was compiled by merging the data available from all three sources described above. The data files were thus matched, so as to extract only those stocks for which data were available from all three sources. This ensures that all data (i.e. stock returns, control and size, and accounting and financial information) are available for each stock.

4.4 Description of the Data Set

The data set thus comprised of information on a total of 613 companies, over the period 1978 - 1991. Table 1 shows the industry-wise break-down of the 613 companies.

as classified according to the Industry Codes used by the TSE300. It can be seen that manufacturing firms accounted for a little over three quarters of the total number of firms included in the analysis. Also, the 'oil and gas', and 'industrial products' firms accounted for about one half of the total manufacturing firms in the analysis. Merchandising firms constituted 52 % of the non-manufacturing firms.

As noted earlier, due to the 'listing - delisting' feature of the TSE300 index, the constituency of the index is fluid. As the data set was basically drawn from an intersection of the three data sources (one of which was the TSE300), this characteristic of fluidity was also inherited by the data set. In fact, not only did the data set comprise of different stocks (for different years), but even the number of stocks in the data set is different each year. Table 2 hence shows the number of companies forming part of the data set each year. The rows indicate the "from year" and the columns indicate the "to year". The numbers along the principle diagonal thus indicate the number of companies forming part of the data set in the given year. The number in cell C (i,j) indicates the number of companies forming part of the data set, which were listed in year i, and continued to be listed in year j. Table 3 also reveals that the data set includes at least 236 companies and at the most 264 companies for any given year. A total of 613 companies form part of the data set, over a period of 14 years from 1978 to 1991.

4.6 Exclusion of certain firms : In contrast with the US where there are a large number of small banks, the Canadian banking industry is characterized by a small number of large

banks. All of these banks are widely held due to the government imposed ownership restrictions. Utility companies in Canada are largely regulated by the federal and provincial governments. This study hence excluded banks and utility companies, and stocks included in the 'Gold' and 'Pipelines' sub-indices from the analysis, as these industrial sectors are influenced by factors which are substantially different from those influencing other industries.

5. METHODOLOGY

5.1 Formation of Portfolios

This study employed the portfolio approach for the analysis. Instead of studying the relationship between control and performance at the firm level, this study analyzed the relationship at a portfolio level. As this study tests for the relationship between control and performance along with the estimation of any impact due to the size of the firm, two sets of portfolios were formed, 'Control' portfolios and 'Size' portfolios. In order to test for the relationship between control and performance, 'control portfolios' were formed by ranking the firms in the ascending order of control, and placing each firm in one of four portfolios representing the four quartiles. Thus portfolio 1 (PTF 1) represents the portfolio of firms in the first (lowest) 'control' quartile. PTF 4 represents the portfolio of firms in the last (largest) control quartile. It should be noted that as the portfolio formation is based on quartiles, for a given year, each portfolio has an equal number of stocks. The

nature of the relationship between control and performance can be studied by examining the portfolio returns, as control increases from portfolio 1 through portfolio 4. Furthermore, for each portfolio thus formed, the portfolio return was calculated in two ways - (i) by allotting equal weights to each stocks in the portfolio, and (ii) by allotting weights to the stocks, proportional to the market capitalization. Thus, in the case of "equally weighted" portfolios, each stock receives an equal weight (i.e. an equal investment is made in each stock forming part of the portfolio). In the case of the "value weighted" control portfolios, the weight of each stock is proportional to its size (market capitalization) [as at the end of the previous calendar year]. Thus, the investment made in a stock would be proportional to its size, within a given control portfolio. The portfolios were revised annually, using the ownership data as of December 31 each year.

Similarly, 'size portfolios' were formed by ranking the firms in the ascending order of size, and placing each firm in one of four 'size quartile' portfolios. Two types of portfolio returns were computed for each portfolio - equally weighted, and 'control weighted', where the weight of each stock is proportional to its 'control measure' (described in section 3.3 (b)) [as at the end of the previous calendar year]. As in the case of 'Control Portfolios', the 'Size Portfolios' were also revised annually, using the market capitalization data as of December 31 each year. It should be noted that the same stocks were used in 'Control' and 'Size' portfolios for a given year.

In this way, the comparison of the performance of control portfolios 1 through 4

would reveal the nature of the relationship between control and performance (e.g., a positive relationship would be discernible if the performance increased from portfolio 1 to portfolio 2, through portfolio 4). A similar comparison of the size portfolios examines the relationship between size and performance.

The comparison of the value weighted control portfolios with equally weighted portfolios enables one to examine the effect of size, as an intervening variable, on the control-performance relationship. Similarly, the comparison of control weighted size portfolios with equally weighted portfolios examines and corroborates the relationship between control and performance.

In order to control for any variations in returns attributable purely to the nature of industry of the firms, the portfolios were formed distinctly for Manufacturing and Non-Manufacturing firms. Furthermore, in order to test for the robustness of the results as regards the periodicity of the portfolio revision, a three year portfolio revision strategy was also employed and tested. Thus, the portfolios were revised every three years, and the results of the analysis (using 3 year revision) were studied in light of the results of the analysis using annual portfolio revision. The January effect was tested for by comparing the average returns of months including January, with those of months not including January. Significantly larger returns of months including January than those not including January would point to the existence of a January effect. Insert B shows the overall portfolio formation, weighting, grouping, and revision procedure.

INSERT B

Portfolio formation, revision, and return calculation procedure, with sectoral grouping.

PTF formation variable	Weight variable 1	Weight variable 2	Sector Groups	PTF revision
Control	equal	size	manufacturing non-mfr	annual (1 YR) 3 YR
Size	equal	control	manufacturing non-mfr	annual (1 YR) 3 YR

5.2 Statistical Analysis

Two complementary techniques were employed by this study. Firstly, the Sharpe measure (of portfolio performance) was computed, and the Jobson-Korkie (1981) test was carried out to test whether the Sharpe measure of the portfolio was significantly different from that of the benchmark "market" portfolio (the TSE300).⁷ Secondly, a non-parametric test of proportions was carried out. This test compares the proportion of the number of

⁷ See Kryzanowski and Zhang (1992). The Sharpe measure is given by $\Phi_i = \mu_i / \sigma_i$ where μ_i is the mean excess return on portfolio i , and σ_i is the estimated standard error of the excess return of portfolio i .

The Jobson - Korkie test statistic for the Sharpe measure is given by $Z_{ij} = \hat{A}_{ij} / \sqrt{\hat{\theta}_{ij}}$ where $\hat{A}_{ij}$ is the sample estimate of the transformed difference between the Sharpe measures of portfolios i and j , and $\hat{\theta}_{ij}$ is the estimate of the variance of $\hat{A}_{ij}$.

times that the return on one portfolio (say, PTF i) is greater than that on another portfolio (say, PTF j) over the period of 14 years (1978-1991). Although this test does not deal with the economic significance of the portfolio returns, it does give an idea about the nature of relationship (portfolio dominance) between the variables tested (control, size, and performance), and also the stability of the relationship over time. To complement this test, the (parametric) two tailed test of significance of difference between mean portfolio returns was carried out. This test reflects upon the economic significance of the difference between the mean returns of two portfolios. These two tests together show whether the relationship between control and performance is stable over time, but do not test the economic significance. Together with the Sharpe measures, these tests examine whether a given portfolio dominates another (by magnitude) more or less evenly in time, or whether such domination is significant due to significantly greater, sporadic returns.

Taking into consideration the documentation of the January effect on American as well as Canadian stock markets, this study also attempted to see whether the extent to which the portfolio returns would have been different, if all 'January returns' were excluded from the analysis.⁸ This would also enable us to examine whether the nature of relationship between control and performance would change significantly, just due to the elimination of the January returns.

⁸ Roll (1983), Haugen and Lakonishok (1989), and Jaffe, Keim and Westerfield (1989) report a significant "January effect" in the American stock markets. Similarly, Tinic, Barone-Adesi and West (1987) observe a January effect in stock returns on the TSE 300 index, for the entire period from 1950-1980.

6. FINDINGS

Insert C describes the way in which the findings of this study are presented, and the relationship of the tables with the portfolio formation strategies (discussed in section 5.1).

INSERT C

Relationship of Tables with various portfolio strategies.

1 YR revision.

PTF formation variable	Weight variable 1	Weight variable 2
Control	equal Manufacturing (5.1) Non-Mfr (5.3)	size Manufacturing (5.2) Non-Mfr (5.4)
Size	equal Manufacturing (5.5) Non-Mfr (5.6)	size Manufacturing (5.7) Non-Mfr (5.8)

3 YR revision.

PTF formation variable	Weight variable 1	Weight variable 2
Control	equal Manufacturing (9.1) Non-Mfr (9.3)	size Manufacturing (9.2) Non-Mfr (9.4)
Size	equal Manufacturing (9.5) Non-Mfr (9.6)	size Manufacturing (9.7) Non-Mfr (9.8)

The table headings provide a short description about the portfolios to which they pertain. Thus Table 5.1 (1YR, MFR, CONTROL, EQL) pertains to the annually revised portfolios of manufacturing firms, formed by ranking stocks by the order of their Control measure, and with equally weighted portfolio returns.

In Table 3, the 'control' characteristics of the portfolios are described, for the selected years (Table 3.1 describes manufacturing portfolios, and 3.2 describes non-manufacturing portfolios). Thus, it can be seen from Table 3.1 that for the year 1978, the average 'control measure' of manufacturing firms was 39 percent (indicating that on an average, the firms forming part of the portfolios were "controlled" to the extent of 39 percent of their outstanding equity), with a minimum of 0 percent control (fully tradeable stock) and a maximum of 92.5 percent (ie. 92.5 percent of the outstanding equity of the highest controlled firm was controlled to the extent of 92.5 percent). The quartile cut-offs were 17.5 %, 47.5 %, and 62.5 %, denoting that PTF 1 included stocks having control ranging from 0 % (inclusive) upto 17.5 % (not inclusive) with the mean control being 0 %, PTF 2 included stocks having control ranging from 17.5 % to 47.5 % (with a mean of 32 %), and so on. It can be seen that overall, manufacturing firms were controlled to the extent of 38 % of their outstanding equity, while non-manufacturing firms were controlled to the extent of 33 % only.

Part A of Tables 4, 5, 8, 9, and 12 shows how a dollar invested in aggregate

portfolios formed of manufacturing firms and non-manufacturing firms would grow from 1978 to 1991, with cumulative reinvestment each month. The growth of a dollar investment in the TSE300 index is also specified in Tables 4 and 8, for the purposes of comparison. Three types of investment schemes are specified in the tables : equally weighted (where each stock receives an equal weight in the portfolio), control weighted (where the stocks are represented in the proportion of their "control measure") and size weighted (where the stocks are represented in the proportion of their market capitalization). Part B of the Tables shows the overall portfolio characteristics : the average monthly return and its standard deviation, the average monthly excess portfolio return and its standard deviation, the Sharpe measure of the portfolio, and the JK Z value representing the level of significance of the portfolio sharpe measure being different from the TSE300 sharpe measure. The last row of Part B shows the portfolio beta. Part C of the Tables shows the overall portfolio characteristics for three time intervals : 1978-1981, 1982-1986, and 1987-1991.

Tables 6 and 7 show the non-parametric test of proportions, and the test of difference between mean portfolio returns, respectively. Tables 10 and 11 show the results of similar tests, using a three year portfolio revision scheme.

Sharpe Measures, JK Z test:

Before examining the nature of the relationship between control and performance, the over sub-group (manufacturing v/s non-manufacturing) characteristics are studied.

A) Manufacturing v/s Non-manufacturing firms:

It can be seen from Table 4 that over the span of 14 years, the non-manufacturing firms out-performed the manufacturing firms, and in fact the market. This is seen for all three types of portfolio schemes (equally weighted, control weighted, and size weighted). Another observation which is quite striking is the value of the portfolio beta : while the "manufacturing" portfolios have a beta greater than 1, the "non-manufacturing" portfolios have a beta less than 1. This seems to suggest that although non-manufacturing firms have a higher return (than manufacturing firms), they are perceived to be less risky (risk, being measured here by the degree of variability of the returns). This is brought out by the fact that non-manufacturing firms have a standard deviation of the average monthly returns less than that of manufacturing firms. This is quite an interesting observation, and deserves further scrutiny. As a joint effect of a higher average return, and a lower standard deviation of the returns, the sharpe measure of the portfolios of non-manufacturing firms are substantially greater than those of manufacturing firms.

Furthermore, Table 4(A) shows that until 1982, it was the manufacturing firms which dominated the non-manufacturing firms (except in the case of control weighted portfolios), and, in fact, they also outperformed the market. 1982 seems to have been a turning point, where the trends were reversed, and non-manufacturing firms started to outperform manufacturing firms (and the market), while manufacturing firms underperformed the market. Part C of Tables 4 and 5 shows a clear three-way split. In the first time period (1978-1981), manufacturing firms significantly outperformed the

market, while the non-manufacturing firms underperformed the market (though not significantly). In the second time interval (1982-1986), manufacturing firms performed significantly worse than the market, while non-manufacturing firms significantly outperformed the market. In the third interval (1987-1991), both manufacturing and non-manufacturing firms underperformed the market. This may perhaps be a manifestation of the recession which gripped North America during this period - while both manufacturing and non-manufacturing sectors were severely affected by the recession, the banking and financial sector (excluded from the analysis for reasons mentioned earlier) managed to do relatively better than the other sectors.

Thus, it is clear that, on the aggregate level there are overall differences in sub-period and over period results, and that the performance of the two sector groups is not stable over time.

B) Control and Performance:

Manufacturing firms:

Table 5.X (X=1..8) shows similar information as Table 4, for various portfolio formation strategies. Exhibit 1 shows the dollar value of the portfolios (formed under various portfolio formation schemes) as at the end of 1991. Table 5 and Exhibit 1 collectively enable us to make the following observations, regarding the relationship between corporate control, and performance.

Tables 5.1 and 5.2, and exhibit 1 suggest the existence of a somewhat convex relationship between control and performance of manufacturing firms. It is seen that as control increases, performance initially increases, attains a peak, and then declines or stays the same. Average monthly returns are the greatest for portfolio 3, which in fact outperforms the market. Portfolios 1, 2, and 4 underperform the market, and indeed portfolios 1 and 2 have a negative average monthly excess return. This convex nature of the relationship may be what renders the comparison of Table 5.1 with 5.2 (as shown in Table 5.9) difficult. No specific pattern of domination (of control weighted portfolios over equally weighted portfolios) is observed.

Non-manufacturing firms: The relationship between control and performance of non-manufacturing firms is not brought out as clearly as that of manufacturing firms. The equally weighted and value weighted portfolios display somewhat differing characteristics, and no precise observations can be made except for the fact that portfolio 3 dominates both portfolio 2 and portfolio 1. This should, however, not lead us to expect a maximization of performance in the third quartile firms. This is because the first quartile firms outperform the third quartile firms in case of an equally weighted portfolio, while the reverse is true in the case of a value weighted portfolio.

The relationship between Control and Performance, as observed by this study, is compared, and contrasted with the relationships as observed by other researchers, in Exhibit 3. When making such comparison, it should be remembered that such a

comparison, is not really scientific, as different researchers have used different measures of both control and performance. Also, most other studies have looked at managerial ownership as a measure of control, and have looked only at a 0 to 30 % range of control, while the present study has looked at a range of 0 to 95 % control. This is partly because the previous studies are mostly American studies, and that, as observed by Morck and Stageland, American firms tend to be less closely held than Canadian firms. Thus, the observations of this study pertain to a much wider range of control, than previous studies. Furthermore, while most of the previous studies are cross-sectional analyses, this study presents a logitudinal analysis of the relationship between control and performance. It can be seen from Exhibit 3 that the relationship between control and performance, as observed by this study, is very different from (and indeed, in some cases, exactly contrary to) that observed by previous studies.

C) Size and Performance:

Manufacturing firms : A monotonically positive relationship is observed between the size of manufacturing firms and their performance (measured both by the average monthly excess returns, and by the cumulative wealth as of the end of 1991). This positive relationship is documented in both the equally weighted and the value weighted portfolios. It can thus be inferred that the portfolio value increases with the size of the constituent firms (as evidenced by Tables 5.5, 5.6, and Exhibit 1). Portfolios representing larger companies outperform those representing smaller companies, and indeed the portfolio representing the largest quartile of the sample (PTF4) outperforms the TSE300. Although

at first this seems to contradict the well-known small firm effect, it should be recognized that the data set studied basically comprised of firms listed on the TSE300 - which are the larger stocks listed on the TSE. Thus these observations actually pertain to large firms. It can hence be said that, among large firms, the firm performance is positively related to the firm size - i.e. the larger of the large firms outperform the smaller of the large firms. This is also brought out by comparing the results between table 5.5 and 5.6, as shown in table 5.10. It can be seen that the size weighted portfolios always dominate the equally weighted portfolios, except in the case of the 'very high control' portfolio.

Non-manufacturing firms : The relationship observed between the returns of non-manufacturing firms and their size, is somewhat different from that observed in the case of manufacturing firms. Non-manufacturing firms seem to display a convex relationship between returns and size. The cumulative wealth (and the average return) was maximized in portfolio 2 (representing firms in the second size quartile). Tables 5.5 and 5.5 show that the second and the third quartile portfolios in fact significantly outperform the market. Thus, as firm size increases, firm performance initially increases, and then drops down. This does get reflected in Table 5.11 which compares Table 5.5 with 5.6. No specific pattern is seen as regards the domination of size weighted portfolios over the equally weighted portfolios. Thus, this convex relationship may suggest that there may exist an "optimal" size for non-manufacturing firms, where firm performance is maximized.

Test of proportions, and test of difference between mean returns:

The non-parametric test (of proportions) was conducted to verify the nature of the relationships observed above. This test verifies whether portfolio i significantly dominates portfolio j, by comparing the number of times the monthly returns of portfolio i was greater than that of portfolio j. Although this test does not test for the economic significance, it does provide good corroboration of the nature of relationship portrayed. Tables 6 and 10 show the results of the test, which essentially confirm the conclusions drawn and expressed in the previous few paragraphs. So also, the test of difference between mean returns (Tables 7 and 11) does corroborate the test of proportions, but does not show any significant differences between the mean portfolio returns.

Three Year Portfolio Revision: In order to test how sensitive are the results to the periodicity of portfolio revision, a three-year portfolio revision strategy was employed, and the Sharpe Measures and JK Z were computed, and the test of proportions as also the test of difference in mean returns was performed. The results are presented in Tables 8 to 11 (corresponding to Tables 4 to 7). It can be seen that while performance trends (across the three time sub-periods) are similar to those observed with annually revised portfolios, the nature of relationship between control and performance is radically different in the 3 YR portfolios than in the 1YR portfolios. Indeed, in the case of non-manufacturing firms, it has changed from a flat inverted U shape (1YR) to a deep U shape (3 YR) ! So also, the nature of the relationship (shape of the curve) as seen in the three time sub-periods is

different in a 3YR portfolio revision scheme than in a 1 YR portfolio revision scheme. From this, it can be seen that the nature of relationship between control and performance is substantially sensitive to the portfolio revision strategy, as also the time period under study. A great deal of caution should hence be exercised when interpreting and employing the results of analyses based on cross-sectional data.

Exclusion of 'January': Table 12 shows the cumulative wealth, and mean monthly returns for a time series of monthly returns over the time period 1978-1991 excluding the returns for the month of January. It is seen that for manufacturing firms, the average return (and sharpe measure) for months other than January are significantly lower than those for the months including January. However, this is not seen in the case of non-manufacturing firms. This could be a possible indication that the January effect is associated more with manufacturing firms than with non-manufacturing firms. The methodology used in this study is not robust enough to test the January effect per se. It is, however, suggestive of a possible sector-specific January effect.

Comparing Tables 12, 9 and 5, it is observed that in the case of both manufacturing and non-manufacturing firms, the nature of relationship (control and performance) as shown by Table 12 is substantially different than that displayed in Table 5 (which is different from that displayed in Table 9). It is thus seen that the nature of relationship between control and performance is largely governed by the time span under study, and the periodicity of portfolio revision.

7. IMPLICATIONS AND LIMITATIONS

7.1 Implications: The findings of the study do have some implications which would be of interest to portfolio managers and investors, and researchers and academics.

a) Researchers and academics : This study does bring out clearly that a lot more research needs to be done before anything can be conclusively (or even substantively) said about the relationship between control and performance. Not only are the findings largely dependent upon the measures used, but the longitudinal analysis (presented in this study) sharply contrasts, and generally contradicts the "conclusions" drawn by researchers using cross-sectional ("snapshot") analyses.

Other areas where further research would be warranted, were also highlighted by this study. The observation of a "January effect" localized to the manufacturing sector needs to be examined further. Also, the different performance patterns of manufacturing and non-manufacturing firms across the three sub-periods also need to be studied.

b) Portfolio managers and investors: As observed in this study, the relationship between control and performance is sector specific. In the case of manufacturing firms, a portfolio of stocks of firms with a very high (as well as very low) control performed somewhat worse than that of stocks of firms with a medium level of control. For non-manufacturing firms, 'tilting' the portfolio based on control seems to have some performance

implications. The relationship is, however, convex.

It is also seen that the performance patterns between sectors were different across the sub-periods, and that while an investor would have done better investing in a portfolio of manufacturing firms in the first time period, a portfolio of non-manufacturing firms would have outperformed the market in the second time period. As regards size based portfolio management, an investor would have been better off investing in large manufacturing firms.

It should be understood that the study conducted an ex-post facto analysis, and does not really provide for formulation of strategies based on ex-ante expectations. Furthermore, as the control-performance relationship was not observed to be consistent over time, the predictive power of the analysis is, to a large extent, restricted.

7.2 Limitations: The research design adopted by this study does have some limitations, and these could impact the comparability of the results with those of existing studies.

a) Arbitrary Quartile partitioning: Since the study used a portfolio approach, and partitioned the stocks into portfolios based on quartiles, it actually examines the relationship between a "relative" measure of control, and performance. This may seem to be somewhat arbitrary, and does not necessarily enable comments being made about any "absolute" measures of control.

b) Identity of Controlling owner : This study also does not identify the controlling owner, and does not take into consideration the possible impact that different controlling owners may have on the performance. For example, there may be a possible difference between the performance, depending on the identity of the controlling owner (group-ownership, institutional ownership, individual control, family-control, foreign owned, etc.).

c) Exclusion of Banks and Utility firms : The fact that banks and utility companies were excluded from the analysis should also be taken into consideration when comparing the results of the analysis with other studies.

d) Industry Classification: This study conducted the analysis in two sectoral sub-groups. This classification of the stocks into manufacturing and non-manufacturing firms may have resulted in loss of industry-specific (eg retailing v/s electronics) information. However, an industry-specific analysis would have required a substantially larger data set than what was available.

e) Selection of the Data Set : While the study set out to examine Canadian corporations, it basically addresses only those companies which are listed on the TSE300 index. The TSE300 index is thus considered as a proxy for the market. The study generalizes the observations from a sample of companies (those listed on the TSE300 index) to Canadian corporations at large. Considering the fact that the Toronto Stock Exchange is the largest stock exchange in Canada, it may not appear unreasonable to make such generalizations.

Definition of Control: Though not exactly a "limitation", it should be appreciated that most of the studies conducted so far have used varying measures of control, and that, as the "definition" of control is so different across studies, the results are not necessarily comparable.

8. CONCLUSION

The main purpose of this study was to provide an investor based perspective on the issues of control and performance, and examine the nature of the relationship between them. This study firstly found that the relationship between control and performance is sector specific. Furthermore, such relationship is also largely governed by the time-span under study, and the periodicity of the portfolio revision. The general nature of the relationship between control and performance, as observed by this study involving longitudinal data, was in fact quite the opposite of what was observed in previous cross-sectional "snapshot" analyses. Furthermore, the nature of the relationship is greatly dependent upon the definition of control. A positive size effect was observed in the case of Manufacturing firms, and this indicates that the larger of the large Canadian firms outperform the smaller of the large Canadian firms. The January effect was observed to be localized to manufacturing firms, and was not significant in the case of non-manufacturing firms.

Thus, our results indicate that conclusions based on previous empirical research about the relationship between control and performance need to be viewed with caution.

TABLE 1

Industry-wise break-down of firms in data set.

Ind. No.	Industry	Number	% of Group	% of TS
	Manufacturing			
1	Metals and Minerals	63	18	14
3	Oil and Gas	113	32	25
4	Paper and Forest Products	24	7	5
5	Consumer Products	41	13	10
6	Industrial Products	71	20	16
7	Construction	23	7	5
8	Transportation	10	3	2
	MFR Sub-Total	345	100	75
	Non Manufacturing			
11	Communications	30	27	7
12	Merchandising	57	52	12
14	Management Companies	23	21	5
	NON-MFR Sub-Total	110	100	25
	MFR + NON-MFR Total	455	100	100
	Excluded from Analysis			
2	Gold	59		
9	Pipelines	6		
10	Utilities	25		
13	Financial Services (Banks)	65		
	Total Sample	515		

TABLE 2

Table showing the number of companies in data set (1978-1991).

Year	78	79	80	81	82	83	84	85	86	87	88	89	90	91
78	240	216	204	185	180	176	165	155	141	126	114	112	107	101
79		236	218	196	190	183	172	162	148	132	120	117	112	106
80			241	215	207	197	182	169	153	138	124	121	117	111
81				249	234	218	200	182	161	144	129	125	121	116
82					247	228	208	188	167	148	129	124	120	115
83						247	225	198	176	156	137	129	124	120
84							250	219	194	173	152	142	137	131
85								243	210	189	166	156	150	141
86									249	223	194	183	173	159
87										254	220	206	195	176
88											257	237	221	196
89												262	245	218
90													260	232
91														264

TABLE 3.1 (MFR)

Table showing the average percentage control of the "Control" portfolios (un-shaded), the minimum and maximum control, and quartile cut-offs (shaded) of manufacturing firm portfolios.

MFR		19 78	19 82	19 87	19 91	OVERALL
	Min	0.0	0.0	0.0	0.0	
PTF1		0	0	0	0	0
	Q1	17.5	17.5	17.5	0.0	
PTF2		32	30	34	28	31
	Q2	47.5	42.5	47.5	37.5	
PTF3		53	50	51	50	51
	Q3	62.5	57.5	57.5	57.5	
PTF4		74	72	73	73	73
	Max	92.5	87.5	93.5	93.5	
AVG		39	38	39	37	38

TABLE 3.2 (NON)

Table showing the average percentage control of the "Control" portfolios (un-shaded), the minimum and maximum control, and quartile cut-offs (shaded) of non-manufacturing firm portfolios.

NON		19 78		19 82		19 87		19 91		OVERALL
	Min		0.0		0.0		0.0		0.0	
PTF1		0		0		0		0		0
	Q1		0.0		0.0		0.0		0.0	
PTF2		23		19		17		25		21
	Q2		37.5		37.5		37.5		42.5	
PTF3		44		46		47		53		47
	Q3		52.5		52.5		57.5		62.5	
PTF4		68		67		64		69		67
	Max		87.5		87.5		77.5		82.5	
AVG		33		32		31		36		33

EXHIBIT 1: Value of \$1 cumulatively reinvested in portfolios. X Axis : Portfolio i Y Axis : Cumulative Wealth (\$)

EXHIBIT 1 cntd.

EXHIBIT 2

Exhibit showing the relationship between performance and control / ownership, as documented by previous studies and as observed in the present study.

(MFR: Manufacturing firms; NON : Non-manufacturing firms; CHH: Chen, Hexter, and Hu; MSV: Morck, Schleifer, and Vishny; NS: Neun, and Santerre; W: Wruck)

TABLE 4 (1YR, OVERALL MFR/NON-MFR, TSE 300)

A: Growth of \$1 cumulative investment in aggregate portfolios of manufacturing and non-manufacturing firms, revised annually. Growth of \$1 cumulative investment in the TSE 300 index.

B: Average monthly returns and their standard deviations, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A:	Year	EQL		CTRL WTD		SIZE WTD		TSE
		MFR	NON	MFR	NON	MFR	NON	
	77	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	78	1.39	1.39	1.42	1.43	1.35	1.31	1.29
	79	2.28	1.61	2.28	1.59	2.20	1.53	1.88
	80	3.20	2.32	3.17	2.19	2.90	2.13	2.44
	81	2.71	2.12	2.90	1.89	2.80	1.95	2.20
	82	2.66	2.57	2.79	2.33	2.57	2.23	2.32
	83	3.46	4.21	3.72	3.83	3.50	3.68	3.14
	84	3.08	4.29	3.26	3.83	3.22	3.65	3.06
	85	3.47	6.57	3.73	5.96	3.75	5.29	3.83
	86	3.50	7.71	3.70	7.24	4.11	6.44	4.17
	87	3.83	7.57	4.00	7.44	4.41	6.21	4.41
	88	4.28	9.97	4.72	9.78	4.90	7.90	4.90
	89	4.71	10.64	5.18	10.30	5.64	8.73	5.95
	90	3.55	6.87	3.89	6.21	4.75	6.50	5.07
	91	3.70	7.76	4.14	7.11	5.15	7.11	5.68
B:								
	Avg Retn (%)	0.97	1.36	1.01	1.34	1.23	1.33	1.17
	S.D (%)	6.07	5.38	6.12	5.94	6.12	5.66	5.07
	XS Retn (%)	0.05	0.44	0.09	0.42	0.34	0.41	0.25
	S.D. (%)	6.11	5.44	6.17	5.99	6.16	5.71	5.13
	Sharpe	0.01	0.08	0.01	0.07	0.06	0.07	0.05
	JK Z	0.09	1.37	-0.82	0.38	1.36	0.43	0.00
	Beta	1.07	0.80	1.02	0.83	1.09	0.87	1.00

TABLE 4 cont.

C: Average monthly returns and their standard deviations, average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE30}$), Portfolio Beta.

	EQL		CTRL WTD		SIZE WTD		TSE
(1978-1981)	MFR	NON	MFR	NON	MFR	NON	
Avg Retn (%)	2.33	1.69	2.45	1.45	2.38	1.53	1.83
S.D (%)	6.88	5.08	6.68	5.41	7.38	5.61	5.92
XS Retn (%)	1.27	0.63	1.39	0.39	1.32	0.47	0.77
S.D. (%)	6.99	5.21	6.79	5.53	7.46	5.72	6.03
Sharpe M.	0.18	0.12	0.20	0.07	0.18	0.08	0.13
JK Z	2.25**	-0.11	2.41**	-0.26	1.52	-0.93	0.00
Beta	1.11	0.68	1.03	0.69	1.13	0.76	1.00
(1982-1986)							
Avg Retn (%)	0.49	2.26	0.47	2.36	0.83	2.14	1.18
S.D (%)	5.74	5.09	5.88	5.56	5.93	5.55	4.69
XS Retn (%)	-0.38	1.39	-0.39	1.48	-0.04	1.27	0.31
S.D. (%)	5.78	5.13	5.91	5.68	5.97	5.58	4.70
Sharpe M.	-0.07	0.27	-0.07	0.26	-0.01	0.23	0.07
JK Z	-3.13**	3.37**	-2.73**	3.06**	-1.71**	2.74**	0.00
Beta	1.05	0.76	1.01	0.80	1.08	0.85	1.00
(1987-1991)							
Avg Retn (%)	0.35	0.21	0.38	0.24	0.49	0.35	0.64
S.D (%)	5.52	6.00	5.72	6.44	5.58	5.70	4.74
XS Retn (%)	-0.50	-0.64	-0.46	-0.61	-0.37	-0.50	-0.22
S.D. (%)	5.55	6.03	5.75	6.48	5.60	5.72	4.76
Sharpe M.	-0.09	-0.11	-0.08	-0.09	-0.07	-0.09	-0.05
JK Z	-1.18	-1.16	-0.78	-0.91	-0.58	-0.93	0.00
Beta	1.02	0.98	1.00	1.03	1.06	1.00	1.00

TABLE 5.1 (1YR, MFR, CTRL, EQL)

A: Growth of \$1 cumulative investment in equally weighted portfolios of manufacturing firms, revised annually by ranking firms by control.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PFF} = Sh_{TSE300}$), Portfolio Beta.

As	Year	FTV 1	FTV 2	FTV 3	FTV 4	MFR
	77	1.00	1.00	1.00	1.00	1.00
	78	1.35	1.42	1.45	1.38	1.39
	79	2.19	2.35	2.37	2.20	2.28
	80	3.01	3.33	3.32	2.96	3.20
	81	2.28	2.54	3.09	2.98	2.71
	82	2.17	2.25	3.05	2.92	2.66
	83	2.61	2.70	4.21	4.04	3.46
	84	2.07	2.53	3.61	3.69	3.08
	85	2.37	3.08	4.36	4.03	3.47
	86	2.30	2.60	4.96	3.96	3.50
	87	2.35	2.73	5.72	4.30	3.83
	88	2.71	3.05	6.76	5.32	4.28
	89	2.97	3.40	7.80	5.56	4.71
	90	2.61	2.51	5.94	4.01	3.55
	91	2.79	2.32	6.36	4.56	3.70
B:		FTV 1	FTV 2	FTV 3	FTV 4	MFR
	Avg Retn (%)	0.82	0.71	1.28	1.07	0.97
	S.D. (%)	6.46	6.34	5.86	5.61	6.07
	XS Retn (%)	-0.10	-0.21	0.36	0.15	0.05
	S.D. (%)	6.51	6.39	5.91	5.66	6.11
	Sharpe M.	-0.01	-0.03	0.06	0.03	0.01
	JK Z	-0.60	-1.09	1.78**	0.55	0.08
	Beta	1.15	1.11	1.05	0.96	1.07

TABLE 5.1 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTF} = Sh_{TSE,NN}$), Portfolio Beta.

C	PTF 1	PTF 2	PTF 3	PTF 4	PTF 5
1970-81					
Avg. Retn (%)	2.03	2.24	2.58	2.49	2.33
S.D. (%)	7.70	7.41	6.43	6.06	6.97
XS Retn (%)	0.96	1.17	1.52	1.42	1.27
S.D. (%)	7.81	7.54	6.55	6.16	7.07
Sharpe M.	0.12	0.16	0.23	0.23	0.18
JK Z	-0.15	1.34	4.41**	4.06**	1.95**
Beta	1.24	1.20	1.03	0.96	1.11
1982-1985					
Avg. Retn (%)	0.20	0.21	0.96	0.61	0.49
S.D. (%)	6.11	5.83	5.88	5.20	5.74
XS Retn (%)	-0.68	-0.66	0.08	-0.27	-0.38
S.D. (%)	6.14	5.87	5.93	5.24	5.78
Sharpe M.	-0.11	-0.11	0.01	-0.05	-0.07
JK Z	-4.00**	-4.37**	-1.46	-2.52**	-3.13**
Beta	1.09	1.07	1.12	0.91	1.05
1987-1988					
Avg. Retn (%)	0.49	-0.02	0.56	0.39	0.34
S.D. (%)	5.66	5.76	5.24	5.53	5.66
XS Retn (%)	-0.37	-0.88	-0.30	-0.47	-0.51
S.D. (%)	5.68	5.79	5.27	5.57	5.69
Sharpe M.	-0.06	-0.15	-0.06	-0.08	-0.09
JK Z	-0.60	-2.42**	-0.30	-0.95	-1.08
Beta	1.08	1.01	0.99	1.00	1.02

TABLE 5.2 (1YR, MFR, CTRL, WTD)

A: Growth of \$1 cumulative investment in size weighted portfolios of manufacturing firms, revised annually by ranking firms by control.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{TF} = Sh_{TSE300}$), Portfolio Beta.

A: Year	FTF 1	FTF 2	FTF 3	FTF 4	MFR
77	1.00	1.00	1.00	1.00	1.00
78	1.33	1.42	1.42	1.24	1.35
79	1.98	2.34	2.38	2.10	2.20
80	2.47	3.51	3.37	2.26	2.90
81	1.93	3.44	3.42	2.41	2.80
82	1.94	2.10	3.67	2.55	2.57
83	2.67	3.01	4.75	3.57	3.50
84	2.39	2.90	4.17	3.40	3.22
85	2.89	3.66	4.64	3.79	3.75
86	3.11	3.99	5.22	4.10	4.11
87	3.84	3.67	5.90	4.24	4.41
88	4.57	4.05	6.05	4.94	4.90
89	5.16	5.15	7.20	5.03	5.64
90	4.51	4.52	6.40	3.57	4.75
91	4.26	4.85	7.96	3.54	5.15
B:	FTF 1	FTF 2	FTF 3	FTF 4	MFR
Avg Retn (%)	1.06	1.16	1.45	0.93	1.23
S.D. (%)	6.27	6.50	6.52	5.95	6.12
XS Retn (%)	0.14	0.24	0.53	0.01	0.34
S.D. (%)	6.32	6.54	6.55	5.97	6.16
Sharpe M.	0.02	0.04	0.08	0.00	0.06
JK Z	0.63	0.82	2.27**	0.00	1.36
Beta	1.15	1.11	1.06	0.97	1.09

TABLE 5.2 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

Period	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
Avg. Retn (%)	1.63	2.93	2.87	2.08	2.38
S.D. (%)	7.14	8.07	7.55	6.83	7.38
XS Retn (%)	0.57	1.87	1.81	1.02	1.32
S.D. (%)	7.26	8.15	7.64	6.89	7.46
Sharpe M.	0.08	0.23	0.24	0.15	0.18
JK Z	-2.12**	3.88**	3.06**	0.51	1.52
Beta	1.15	1.27	1.13	0.98	1.13
Period	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
Avg. Retn (%)	0.96	0.43	0.89	1.05	0.83
S.D. (%)	5.71	6.12	6.23	5.77	5.93
XS Retn (%)	0.08	-0.44	0.02	0.18	-0.04
S.D. (%)	5.74	6.19	6.26	5.80	5.97
Sharpe M.	0.01	-0.07	0.00	0.03	-0.01
JK Z	-1.67**	-2.59**	-1.72**	-0.78	-1.71**
Beta	1.11	1.00	1.17	1.02	1.08
Period	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
Avg. Retn (%)	0.72	0.47	0.88	-0.10	0.49
S.D. (%)	6.15	5.16	5.81	5.23	5.58
XS Retn (%)	-0.14	-0.39	0.03	-0.96	0.37
S.D. (%)	6.17	5.16	5.84	5.26	5.60
Sharpe M.	-0.02	-0.08	0.00	-0.18	-0.07
JK Z	0.77	-0.97	-1.95**	-3.24**	-0.58
Beta	1.18	0.99	1.15	0.94	1.06

TABLE 5.3 (1YR, NON-MFR, CTRL, EQL)

A: Growth of \$1 cumulative investment in equally weighted portfolios of non-manufacturing firms, revised annually by ranking firms by control.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

Year	PTF 1	PTF 2	PTF 3	PTF 4	NON
77	1.00	1.00	1.00	1.00	1.00
78	1.42	1.20	1.55	1.38	1.39
79	1.73	1.39	1.86	1.45	1.61
80	2.59	2.32	2.39	1.93	2.32
81	2.76	1.95	2.17	1.60	2.12
82	3.34	2.20	2.58	2.15	2.57
83	5.42	3.34	4.70	3.33	4.21
84	5.73	3.66	4.38	3.24	4.29
85	8.39	5.92	6.89	4.80	6.57
86	9.34	6.43	9.50	5.29	7.71
87	8.17	6.00	10.64	5.24	7.57
88	11.32	7.42	14.19	6.72	9.97
89	13.29	7.51	14.07	7.45	10.64
90	9.06	4.61	8.98	5.30	5.37
91	9.66	5.92	9.24	6.34	7.76
Me	PTF 1	PTF 2	PTF 3	PTF 4	NON
Avg Retn (%)	1.49	1.21	1.50	1.25	1.36
S.D. (%)	5.09	5.33	5.78	5.35	5.38
XS Retn (%)	0.57	0.29	0.58	0.33	0.44
S.D. (%)	5.13	5.39	5.85	5.40	5.44
Sharpe M.	0.11	0.05	0.10	0.06	0.08
JK Z	1.83**	0.90	1.81**	1.08	1.37
Beta	0.65	0.71	0.88	0.88	0.80

TABLE 5.3 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: SH_{PTF} = SH_{TSE300}$), Portfolio Beta.

C:	1972-1	1972-2	1972-3	1972-4	1972-5
1972-81					
Avg. Retn (%)	2.26	1.52	1.76	1.13	1.69
S.D. (%)	4.87	5.03	5.13	5.41	5.08
XS Retn (%)	1.19	0.46	0.70	0.07	0.63
S.D. (%)	4.98	5.15	5.27	5.53	5.21
Sharpe M.	0.24	0.09	0.13	0.01	0.12
JK Z	1.96**	-0.76	0.11	-2.49**	-0.11
Beta	0.60	0.67	0.69	0.76	0.68
1982-1985					
Avg. Retn (%)	2.15	2.13	2.64	2.11	2.26
S.D. (%)	4.62	4.93	5.64	4.56	5.09
XS Retn (%)	1.28	1.25	1.77	1.24	1.39
S.D. (%)	4.66	4.96	5.69	4.58	5.13
Sharpe M.	0.27	0.25	0.31	0.27	0.27
JK Z	3.40**	3.55**	4.30**	3.09**	3.37**
Beta	0.68	0.81	0.89	0.62	0.76
1987-1991					
Avg. Retn (%)	0.21	0.03	0.15	0.49	0.21
S.D. (%)	5.53	5.80	6.22	5.96	6.00
XS Retn (%)	-0.64	-0.82	-0.70	-0.37	-0.64
S.D. (%)	5.55	5.85	6.26	5.99	6.03
Sharpe M.	-0.12	-0.14	-0.11	-0.06	-0.11
JK Z	-1.30	-1.75**	-1.46	-0.36	-1.16
Beta	0.88	0.92	1.08	1.06	0.98

TABLE 5.4 (1YR, NON-MFR, CTRL, WTD)

A: Growth of \$1 cumulative investment in size weighted portfolios of non-manufacturing firms, revised annually by ranking firms by control.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A:	Year	PTF 1	PTF 2	PTF 3	PTF 4	NON
	77	1.00	1.00	1.00	1.00	1.00
	78	1.24	1.11	1.48	1.40	1.31
	79	1.54	1.29	1.84	1.43	1.53
	80	2.22	2.25	2.11	1.92	2.13
	81	2.27	2.03	1.97	1.51	1.95
	82	2.71	2.42	2.10	1.67	2.23
	83	4.19	3.58	4.35	2.61	3.68
	84	3.89	4.02	3.98	2.71	3.65
	85	5.33	6.20	5.83	3.79	5.29
	86	6.25	7.02	8.12	4.36	6.44
	87	5.53	6.29	9.00	4.03	6.21
	88	7.27	8.65	10.65	5.04	7.90
	89	9.29	8.66	11.14	5.84	8.73
	90	6.92	6.27	8.05	4.76	6.50
	91	7.53	7.41	8.25	5.25	7.11
B:		PTF 1	PTF 2	PTF 3	PTF 4	NON
	Avg Retn (%)	1.34	1.35	1.46	1.15	1.33
	S.D. (%)	5.28	5.55	6.24	5.55	5.66
	XS Retn (%)	0.42	0.43	0.53	0.22	0.41
	S.D. (%)	5.32	5.60	6.31	5.61	5.71
	Sharpe M.	0.08	0.08	0.09	0.04	0.07
	JK Z	0.53	0.55	0.80	-0.17	0.43
	Beta	0.73	0.84	1.01	0.87	0.87

TABLE 5.4 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTF} = SH_{TSE300}$), Portfolio Beta.

Period	PTF 1	PTF 2	PTF 3	PTF 4	PTF 5
1975-81					
Avg. Retn (%)	1.86	1.63	1.59	1.02	1.53
S.D. (%)	5.33	5.59	5.86	5.80	5.61
XS Retn (%)	0.80	0.57	0.53	-0.04	0.47
S.D. (%)	5.42	5.69	5.97	5.93	5.72
Sharpe M.	0.15	0.10	0.09	-0.01	0.08
JK Z	0.39	-0.48	-0.88	-3.11**	-0.93
Beta	0.68	0.70	0.83	0.83	0.76
1982-1986					
Avg. Retn (%)	1.84	2.21	2.60	1.92	2.14
S.D. (%)	5.38	4.94	6.67	5.14	5.55
XS Retn (%)	0.96	1.33	1.73	1.04	1.27
S.D. (%)	5.41	4.95	6.73	5.18	5.58
Sharpe M.	0.18	0.27	0.26	0.20	0.23
JK Z	1.62	3.88**	3.58**	2.38**	2.74**
Beta	0.68	0.81	1.09	0.80	0.85
1987-1991					
Avg. Retn (%)	0.44	0.28	0.21	0.48	0.35
S.D. (%)	5.12	6.01	5.98	5.76	5.70
XS Retn (%)	-0.41	-0.58	-0.64	-0.37	-0.50
S.D. (%)	5.14	6.05	6.01	5.78	5.72
Sharpe M.	-0.08	-0.10	-0.11	-0.06	-0.09
JK Z	-0.65	-1.06	-1.88**	-0.40	-0.93
Beta	0.83	1.03	1.14	1.00	1.00

TABLE 5.5 (1YR, MFR, SIZE, EQL)

A: Growth of \$1 cumulative investment in equally weighted portfolios of manufacturing firms. revised annually by ranking firms by size.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A	1YR	PTF 1	PTF 2	PTF 3	PTF 4	MFR
	77	1.00	1.00	1.00	1.00	1.00
	78	1.60	1.26	1.41	1.33	1.39
	79	2.63	2.18	2.19	2.10	2.28
	80	3.83	3.20	2.80	2.81	3.20
	81	3.04	2.54	2.41	2.82	2.71
	82	3.28	2.10	2.26	2.74	2.66
	83	3.81	2.62	3.36	3.73	3.46
	84	2.81	2.26	3.09	3.42	3.08
	85	3.05	2.64	3.71	4.05	3.47
	86	2.23	2.61	3.69	4.86	3.50
	87	2.42	2.88	3.67	5.42	3.83
	88	2.74	3.66	4.21	6.08	4.28
	89	3.03	3.78	4.96	6.76	4.71
	90	2.24	2.76	4.12	5.41	3.55
	91	2.39	3.19	3.77	5.54	3.70
B		PTF 1	PTF 2	PTF 3	PTF 4	MFR
	Avg Retn (%)	0.74	0.87	0.98	1.20	0.97
	S.D. (%)	6.72	5.97	6.11	5.94	6.07
	XS Retn (%)	-0.18	-0.05	0.06	0.28	0.05
	S.D. (%)	6.77	6.02	6.15	5.98	6.11
	Sharpe M.	-0.03	-0.01	0.01	0.05	0.01
	JK Z	-0.62	-0.33	0.18	1.93**	0.09
	Beta	1.04	1.03	1.10	1.12	1.07

TABLE 5.5 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTF} = Sh_{TSE-M}$). Portfolio Beta.

C	PTF 1	TSE 1	PTF 2	TSE 2	TSE 3
1970-81					
Avg. Retn (%)	2.56	2.23	2.11	2.42	2.33
S.D. (%)	6.61	7.34	7.23	6.87	6.88
XS Retn (%)	1.50	1.17	1.05	1.36	1.27
S.D. (%)	6.76	7.45	7.34	6.95	6.99
Sharpe M.	0.22	0.16	0.14	0.20	0.18
JK Z	2.46**	1.14	0.90	3.49**	2.25**
Beta	0.98	1.16	1.18	1.11	1.11
1982-1991					
Avg. Retn (%)	-0.30	0.19	0.87	1.07	0.49
S.D. (%)	6.66	5.42	5.61	5.71	5.74
XS Retn (%)	-1.18	-0.68	-0.00	0.20	-0.38
S.D. (%)	6.68	5.47	5.66	5.75	5.78
Sharpe M.	-0.18	-0.12	-0.00	0.03	-0.07
JK Z	-4.29**	-4.01**	-1.78**	-1.32*	-3.13**
Beta	1.05	0.94	1.05	1.15	1.05
1992-1994					
Avg. Retn (%)	0.33	0.47	0.20	0.36	0.35
S.D. (%)	6.70	5.13	5.55	5.27	5.52
XS Retn (%)	-0.52	-0.38	-0.66	-0.49	-0.50
S.D. (%)	6.73	5.17	5.57	5.30	5.55
Sharpe M.	-0.08	-0.07	-0.12	-0.09	-0.09
JK Z	-0.60	-0.67	-1.99**	-2.25**	-1.18
Beta	1.08	0.92	1.03	1.06	1.02

TABLE 5.6 (1YR, MFR, SIZE, WTD)

A: Growth of \$1 cumulative investment in control weighted portfolios of manufacturing firms, revised annually by ranking firms by size.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A: Size	PTF 1	PTF 2	PTF 3	PTF 4	MFR
77	1.00	1.00	1.00	1.00	1.00
78	1.71	1.28	1.36	1.33	1.42
79	2.73	2.19	2.02	2.18	2.28
80	3.94	3.37	2.59	2.79	3.17
81	3.29	2.80	2.34	3.19	2.90
82	3.32	2.40	2.28	3.15	2.79
83	4.10	3.12	3.42	4.26	3.72
84	3.14	2.73	3.14	4.03	3.26
85	3.31	3.14	3.71	4.75	3.73
86	2.06	3.29	3.60	5.85	3.70
87	2.59	3.70	3.74	5.99	4.00
88	2.91	4.94	4.45	6.57	4.72
89	3.19	5.26	5.22	7.07	5.18
90	2.08	3.95	4.14	5.38	3.89
91	2.38	4.64	3.92	5.64	4.14
B:	PTF 1	PTF 2	PTF 3	PTF 4	MFR
Avg Retn (%)	0.74	1.08	0.99	1.21	1.01
S.D. (%)	6.78	5.81	5.97	5.93	6.12
XS Retn (%)	-0.17	0.16	0.07	0.29	0.09
S.D. (%)	6.83	5.86	6.01	5.96	6.17
Sharpe M.	-0.03	0.03	0.01	0.05	0.01
JK Z	-1.34	-0.51	-1.10	0.00	-0.82
Beta	0.98	0.98	1.06	1.06	1.02

TABLE 5.6 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: SH_{PTF} = SH_{TSE300}$), Portfolio Beta.

Period	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019
Avg. Retn (%)	2.69	2.40	2.02	2.68	2.45
S.D. (%)	6.11	6.94	6.89	6.92	6.68
XS Retn (%)	1.63	1.34	0.96	1.62	1.39
S.D. (%)	6.27	7.05	6.99	6.99	6.79
Sharpe M.	0.26	0.19	0.14	0.23	0.20
JK Z	3.07**	2.19**	0.54	3.22**	2.41**
Beta	0.88	1.08	1.11	1.06	1.03
1970-1979					
Avg. Retn (%)	-0.54	0.41	0.87	1.17	0.4779
S.D. (%)	6.82	5.37	5.49	5.71	5.88
XS Retn (%)	-1.42	-0.46	-0.00	0.30	-0.39
S.D. (%)	6.84	5.43	5.54	5.75	5.91
Sharpe M.	-0.21	-0.08	-0.00	0.05	-0.07
JK Z	-4.31**	-3.10**	-1.75**	-0.43	-2.73**
Beta	0.98	0.92	1.03	1.11	1.01
1980-1989					
Avg. Retn (%)	0.47	0.70	0.30	0.07	0.38
S.D. (%)	7.00	5.11	5.61	5.08	5.72
XS Retn (%)	-0.38	-0.14	-0.55	-0.78	-0.46
S.D. (%)	7.05	5.16	5.63	5.10	5.75
Sharpe M.	-0.05	-0.03	-0.10	-0.15	-0.08
JK Z	-0.15	0.40	-1.31	-3.75**	-0.78
Beta	1.09	0.90	1.02	0.99	1.00

TABLE 5.7 (1YR, NON-MFR, SIZE, EQL)

A: Growth of \$1 cumulative investment in equally weighted portfolios of non-manufacturing firms, revised annually by ranking firms by size.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A	Year	PTF 1	PTF 2	PTF 3	PTF 4	NON
	77	1.00	1.00	1.00	1.00	1.00
	78	1.57	1.46	1.27	1.29	1.39
	79	1.78	1.82	1.35	1.53	1.61
	80	2.78	2.47	1.86	2.22	2.32
	81	2.38	2.32	1.65	2.16	2.12
	82	2.96	2.82	2.06	2.41	2.57
	83	4.63	5.32	3.17	3.76	4.21
	84	4.12	6.28	2.84	4.04	4.29
	85	6.59	9.80	4.66	5.54	6.57
	86	7.33	11.68	5.54	6.58	7.71
	87	7.50	11.38	5.91	5.75	7.57
	88	10.52	14.51	8.16	6.90	9.97
	89	10.49	16.17	8.11	8.01	10.64
	90	6.85	7.86	6.14	6.17	6.87
	91	6.68	10.30	6.96	6.97	7.76
B		PTF 1	PTF 2	PTF 3	PTF 4	NON
	Avg Retn (%)	1.29	1.55	1.32	1.31	1.36
	S.D. (%)	5.57	5.43	5.70	5.32	5.38
	XS Retn (%)	0.37	0.62	0.40	0.39	0.44
	S.D. (%)	5.62	5.50	5.75	5.37	5.44
	Sharpe M.	0.07	0.11	0.07	0.07	0.08
	JK Z	0.92	1.76**	1.41	1.53	1.37
	Beta	0.69	0.73	0.92	0.88	0.80

TABLE 5.7 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTF} = Sh_{TSENN}$), Portfolio Beta.

C:	PTF 1	PTF 2	PTF 3	PTF 4	PTF 5
1970-83					
Avg. Retn	1.93	1.87	1.20	1.76	1.69
S.D.	4.74	4.63	5.57	5.45	5.08
XS Retn	0.87	0.81	0.14	0.70	0.63
S.D.	4.90	4.78	5.67	5.55	5.21
Sharpe M.	0.18	0.17	0.02	0.13	0.12
JK Z	0.89	0.70	-2.36**	-0.03	-0.11
Beta	0.59	0.54	0.79	0.79	0.68
1983-1998					
Avg. Retn	2.00	2.85	2.20	2.00	2.26
S.D.	4.69	5.03	5.74	4.95	5.09
XS Retn	1.12	1.98	1.32	1.12	1.39
S.D.	4.72	5.07	5.77	4.98	5.13
Sharpe M.	0.24	0.39	0.23	0.23	0.27
JK Z	2.26**	4.88**	3.70**	3.04**	3.37**
Beta	0.51	0.70	1.02	0.81	0.76
1997-1998					
Avg. Retn	0.07	-0.02	0.55	0.25	0.21
S.D.	6.74	6.07	5.74	5.50	6.00
XS Retn	-0.78	-0.88	-0.30	-0.60	-0.64
S.D.	6.77	6.12	5.78	5.52	6.03
Sharpe M.	-0.12	-0.14	-0.05	-0.11	-0.11
JK Z	-1.11	-1.81**	-0.14	-1.76**	-1.16
Beta	0.95	0.97	0.97	1.03	0.98

TABLE 5.8 (1YR, NON-MFR, SIZE, WTD)

A: Growth of \$1 cumulative investment in control weighted portfolios of non-manufacturing firms, revised annually by ranking firms by size.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A	Year	PTF 1	PTF 2	PTF 3	PTF 4	PTF 5
	77	1.00	1.00	1.00	1.00	1.00
	78	1.54	1.46	1.25	1.47	1.43
	79	1.66	1.77	1.29	1.65	1.59
	80	2.38	2.38	1.76	2.26	2.19
	81	1.99	2.05	1.42	2.12	1.89
	82	2.60	2.64	1.77	2.30	2.33
	83	4.00	4.86	2.80	3.64	3.83
	84	3.49	5.54	2.39	3.89	3.83
	85	5.96	8.56	3.88	5.43	5.96
	86	6.94	10.96	4.85	6.23	7.24
	87	7.70	11.15	5.29	5.63	7.44
	88	10.37	15.39	6.65	6.72	9.78
	89	10.52	16.75	6.03	7.90	10.30
	90	6.34	7.08	5.19	6.24	6.21
	91	6.61	8.75	5.73	7.35	7.11
B		PTF 1	PTF 2	PTF 3	PTF 4	PTF 5
	Avg Retn (%)	1.30	1.48	1.23	1.34	1.34
	S.D. (%)	5.92	6.10	6.28	5.47	5.94
	XS Retn (%)	0.38	0.56	0.31	0.42	0.42
	S.D. (%)	5.97	6.17	6.34	5.52	5.99
	Sharpe M.	0.06	0.09	0.05	0.08	0.07
	JK Z	0.24	0.65	0.02	0.63	0.38
	Beta	0.72	0.76	0.97	0.88	0.83

TABLE 5.8 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

Period	1970-79	1980-89	1990-99	2000-09	2010-19
Avg. Retn (%)	1.56	1.63	0.89	1.73	1.45
S.D. (%)	4.99	5.17	5.80	5.74	5.41
XS Retn (%)	0.50	0.57	-0.17	0.67	0.39
S.D. (%)	5.15	5.31	5.90	5.86	5.53
Sharpe M.	0.10	0.11	-0.03	0.12	0.07
JK Z	-0.51	-0.28	-3.33**	-0.26	-1.01
Beta	0.61	0.54	0.80	0.81	0.69
Avg. Retn (%)	2.22	2.96	2.30	1.94	2.36
S.D. (%)	4.92	5.34	7.07	5.10	5.65
XS Retn (%)	1.34	2.09	1.43	1.07	1.48
S.D. (%)	4.94	5.38	7.10	5.13	5.68
Sharpe M.	0.27	0.39	0.20	0.21	0.26
JK Z	2.58**	4.64**	2.78**	2.61**	3.06**
Beta	0.49	0.70	1.20	0.82	0.80
Avg. Retn (%)	0.18	-0.11	0.44	0.44	0.24
S.D. (%)	7.27	7.12	5.76	5.58	6.44
XS Retn (%)	-0.66	-0.97	-0.40	-0.41	-0.61
S.D. (%)	7.31	7.18	5.79	5.59	6.48
Sharpe M.	-0.09	-0.14	-0.07	-0.07	-0.09
JK Z	-0.77	-1.51	-0.48	-0.77	-0.91
Beta	1.08	1.06	0.95	1.04	1.03

Table 5.9 (1YR, MFR, CTRL)

A: Table comparing the cumulative wealth of equally weighted v/s value weighted portfolios of manufacturing firms, revised annually by ranking firms by control.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: ShPTF = ShTSE300$), Portfolio Beta.

Rank	PTF 1		PTF 2		PTF 3		PTF 4	
	EQL	WTD	EQL	WTD	EQL	WTD	EQL	WTD
77	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
78	1.35	1.35	1.42	1.42	1.45	1.45	1.38	1.38
79	2.19	2.19	2.35	2.35	2.37	2.37	2.20	2.20
80	3.01	3.01	3.33	3.33	3.32	3.32	2.96	2.96
81	2.28	2.28	2.54	2.54	3.09	3.09	2.98	2.98
82	2.17	2.17	2.25	2.25	3.05	3.05	2.92	2.92
83	2.61	2.61	2.90	2.90	4.21	4.21	4.04	4.04
84	2.07	2.07	2.53	2.53	3.61	3.61	3.69	3.69
85	2.37	2.37	3.08	3.08	4.36	4.36	4.03	4.03
86	2.30	2.30	2.60	2.60	4.96	4.96	3.96	3.96
87	2.35	2.35	2.73	2.73	5.72	5.72	4.30	4.30
88	2.71	2.71	3.05	3.05	6.76	6.76	5.32	5.32
89	2.97	2.97	3.40	3.40	7.80	7.80	5.56	5.56
90	2.61	2.61	2.51	2.51	5.94	5.94	4.01	4.01
91	2.79	2.79	2.32	2.32	6.36	6.36	4.56	4.56
R	PTF 1		PTF 2		PTF 3		PTF 4	
ARet	0.82	0.82	0.71	0.71	1.28	1.28	1.07	1.07
S.D.	6.46	6.46	6.34	6.34	5.86	5.86	5.61	5.61
XSRet	-0.10	-0.10	-0.21	-0.21	0.36	0.36	0.15	0.15
S.D.	6.51	6.51	6.39	6.39	5.91	5.91	5.66	5.66
Sharpe	-0.01	-0.01	-0.03	-0.03	0.06	0.06	0.03	0.03
JK Z	-0.60	-0.60	-1.09	-1.09	1.78**	1.78**	0.55	0.55
Beta	1.15	1.15	1.11	1.11	1.05	1.05	0.96	0.96

Table 5.10 (1YR, NON, CTRL)

A: Table comparing the cumulative wealth of equally weighted v/s value weighted portfolios of manufacturing firms, revised annually by ranking firms by control.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test (H_0 : ShPTF = ShTSE300), Portfolio Beta.

A:Year	PTF 1		PTF 2		PTF 3		PTF 4	
	EQL	WTD	EQL	WTD	EQL	WTD	EQL	WTD
77	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
78	1.42	1.04	1.20	1.11	1.55	1.40	1.38	1.20
79	1.73	1.18	1.39	1.20	1.86	1.50	1.45	1.20
80	2.59	2.28	2.32	2.20	2.39	2.20	1.93	1.80
81	2.76	2.20	1.95	2.00	2.17	2.00	1.60	1.80
82	3.34	2.71	2.20	2.20	2.58	2.20	2.15	2.00
83	5.42	4.00	3.34	3.20	4.70	4.00	3.33	3.00
84	5.73	3.80	3.66	4.00	4.38	3.80	3.24	3.20
85	8.39	5.10	5.92	5.20	6.89	6.00	4.80	4.20
86	9.34	6.20	6.43	7.00	9.50	7.20	5.29	6.20
87	8.17	6.20	6.00	6.20	10.64	8.00	5.24	6.00
88	11.32	7.30	7.42	8.00	14.19	10.00	6.72	8.00
89	13.29	8.20	7.51	8.20	14.07	10.20	7.45	8.00
90	9.06	6.00	4.61	6.20	8.98	6.20	5.30	6.20
91	9.66	7.20	5.92	7.20	9.24	6.20	6.34	6.20
B:	PTF 1		PTF 2		PTF 3		PTF 4	
ARet	1.49	1.24	1.21	1.20	1.50	1.20	1.25	1.20
S.D.	5.09	3.20	5.33	3.20	5.78	3.20	5.35	3.20
XSRet	0.57	0.42	0.29	0.20	0.58	0.20	0.33	0.20
S.D.	5.13	3.20	5.39	3.20	5.85	3.20	5.40	3.20
Sharpe	0.11	0.10	0.05	0.00	0.10	0.00	0.06	0.00
JK Z	1.83**	0.81	0.90	0.20	1.81**	0.20	1.08	0.20
Beta	0.65	0.72	0.71	0.94	0.88	1.00	0.88	0.92

Table 5.11 (1YR, MFR, SIZE)

A: Table comparing the cumulative wealth of equally weighted v/s. control weighted portfolios of manufacturing firms, revised annually by ranking firms by size.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: ShPTF = ShTSE300$), Portfolio Beta.

A:Year	PTF 1		PTF 2		PTF 3		PTF 4	
	EQL	WTD	EQL	WTD	EQL	WTD	EQL	WTD
77	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
78	1.60	1.71	1.26	1.50	1.41	1.36	1.33	1.33
79	2.63	2.73	2.18	2.19	2.19	2.09	2.10	2.18
80	3.83	3.94	3.20	3.31	2.80	2.39	2.81	2.79
81	3.04	3.29	2.54	2.89	2.41	2.34	2.82	3.19
82	3.28	3.32	2.10	2.40	2.26	2.28	2.74	3.15
83	3.81	4.10	2.62	3.12	3.36	3.42	3.73	4.26
84	2.81	3.14	2.26	2.79	3.09	3.19	3.42	4.09
85	3.05	3.31	2.64	3.14	3.71	3.71	4.05	4.75
86	2.23	2.06	2.61	3.29	3.69	3.40	4.86	5.00
87	2.42	2.59	2.88	3.29	3.67	3.74	5.42	5.99
88	2.74	2.91	3.66	4.94	4.21	4.45	6.08	6.57
89	3.03	3.19	3.78	5.20	4.96	5.32	6.76	7.07
90	2.24	2.08	2.76	3.93	4.12	4.14	5.41	5.36
91	2.39	2.38	3.19	4.64	3.77	3.92	5.54	5.44
B:	PTF 1		PTF 2		PTF 3		PTF 4	
ARet	0.74	0.74	0.87	1.08	0.98	0.99	1.20	1.31
S.D.	6.72	6.79	5.97	5.81	6.11	5.97	5.94	5.99
XSRet	-0.18	-0.17	-0.05	0.10	0.06	0.07	0.28	0.29
S.D.	6.77	6.83	6.02	5.89	6.15	6.01	5.98	5.96
Sharpe	-0.03	-0.09	-0.01	0.03	0.01	0.01	0.05	0.05
JK Z	-0.62	-1.34	-0.33	-0.51	0.18	-1.10	1.93**	0.00
Beta	1.04	0.98	1.03	0.98	1.10	1.06	1.12	1.06

Table 5.12 (1YR, NON, SIZE)

A: Table comparing the cumulative wealth of equally weighted v/s control weighted portfolios of non-manufacturing firms, revised annually by ranking firms by size.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: ShPTF = ShTSE300$), Portfolio Beta.

A: Year	PTF 1		PTF 2		PTF 3		PTF 4	
	EQL	WTD	EQL	WTD	EQL	WTD	EQL	WTD
77	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
78	1.57	1.38	1.46	1.46	1.27	1.32	1.29	1.37
79	1.78	1.61	1.82	1.77	1.35	1.38	1.53	1.48
80	2.78	2.38	2.47	2.38	1.86	1.75	2.22	2.32
81	2.38	1.99	2.32	2.05	1.65	1.45	2.16	2.05
82	2.96	2.40	2.82	2.51	2.06	1.77	2.41	2.30
83	4.63	4.00	5.32	4.55	3.17	2.89	3.76	3.59
84	4.12	3.49	6.28	5.34	2.84	2.57	4.04	3.80
85	6.59	5.95	9.80	8.35	4.66	3.88	5.54	5.02
86	7.33	6.94	11.68	10.95	5.54	4.85	6.58	6.08
87	7.50	7.29	11.38	11.15	5.91	5.20	5.75	5.88
88	10.52	10.37	14.51	13.79	8.16	6.85	6.90	6.72
89	10.49	10.37	16.17	15.34	8.11	6.89	8.01	7.90
90	6.85	6.34	7.86	7.08	6.14	5.49	6.17	4.94
91	6.68	6.61	10.30	8.75	6.96	5.78	6.97	7.38
B:	PTF 1		PTF 2		PTF 3		PTF 4	
ARet	1.29	1.30	1.55	1.40	1.32	1.29	1.31	1.35
S.D.	5.57	5.92	6.43	6.30	5.70	6.20	5.32	5.87
XSRet	0.37	0.18	0.62	0.36	0.40	0.31	0.39	0.42
S.D.	5.62	5.87	5.50	6.17	5.75	6.34	5.37	5.64
Sharpe	0.07	0.48	0.11	0.49	0.07	0.48	0.07	0.51
JK Z	0.92	0.34	1.76**	0.49	1.41	0.49	1.53	0.52
Beta	0.69	0.71	0.73	0.75	0.92	0.97	0.88	0.91

TABLE 6 (1YR, NON-PARAMETRIC)

Table showing the proportion (p) of the number of times the monthly return of $R_{it} > R_{jt}$ over the period Jan 1978 to Dec 1991 (N = 168), the proportion q being equal to 1 - p, and the t statistic for the null hypothesis $H_0: p_i > p_j$.

R_{it}	$R_{jt} > R_{it}$	$R_{kt} > R_{it}$	$R_{lt} > R_{it}$		R_{it}	$R_{jt} > R_{it}$	$R_{kt} > R_{it}$	$R_{lt} > R_{it}$
MPR, CTRL, EOL					MPR, CTRL, VALUE, FID			
p	0.48	0.57	0.47		p	0.59	0.52	0.45
q	0.52	0.43	0.53		q	0.41	0.48	0.55
t	-0.61	1.71**	-0.77		t	2.35**	0.30	-1.39
MPR, CTRL, EOL					MPR, CTRL, VALUE, WTD			
p	0.46	0.50	0.49		p	0.52	0.53	0.49
q	0.54	0.50	0.51		q	0.48	0.47	0.51
t	-1.08	0.00	-0.30		t	0.31	0.77	-0.15
MPR, EOL, EOL					MPR, EOL, CTRL, WTD			
p	0.55	0.54	0.55		p	0.55	0.51	0.55
q	0.45	0.46	0.45		q	0.45	0.49	0.45
t	1.24	1.24	1.24		t	1.39	0.30	1.24
MPR, EOL, EOL					MPR, EOL, CTRL, WTD			
p	0.49	0.48	0.55		p	0.47	0.46	0.54
q	0.51	0.52	0.45		q	0.53	0.54	0.46
t	-0.30	-0.61	1.39		t	-0.77	-0.92	0.92

TABLE 7 (1YR, Test of difference between mean portfolio returns)

Table showing the difference between the mean returns ($\mu_i - \mu_j$) of two portfolios (Pi, and Pj), the standard error (σ) of the difference between mean portfolio returns, and the t statistic for the hypothesis $H_0 : \mu_i = \mu_j$.

	P2, P1	P2, P3	P3, P1			P2, P1	P2, P3	P3, P1
MKT. CTRL. EOL					MKT. CTRL. VALUE WTD			
$\mu_i - \mu_j$	-0.11	0.57	-0.21		$\mu_i - \mu_j$	0.09	0.29	-0.52
σ	0.69	0.66	0.62		σ	0.69	0.71	0.68
t	-0.16	0.86	-0.34		t	0.13	0.41	-0.76
NON. CTRL. EOL					NON. CTRL. VALUE WTD			
$\mu_i - \mu_j$	-0.28	0.29	-0.24		$\mu_i - \mu_j$	0.00	0.10	-0.31
σ	0.56	0.60	0.60		σ	0.59	0.64	0.64
t	-0.49	0.48	-0.41		t	0.00	0.16	-0.48
MKT. SIZE. EOL					MKT. SIZE. CTRL. WTD			
$\mu_i - \mu_j$	0.13	0.11	0.21		$\mu_i - \mu_j$	0.34	-0.08	0.21
σ	0.69	0.65	0.65		σ	0.68	0.64	0.64
t	0.18	0.16	0.32		t	0.49	-0.13	0.32
NON. SIZE. EOL					NON. SIZE. CTRL. WTD			
$\mu_i - \mu_j$	0.25	-0.22	-0.01		$\mu_i - \mu_j$	0.18	-0.25	0.11
σ	0.60	0.60	0.60		σ	0.66	0.67	0.64
t	0.42	-0.36	-0.02		t	0.27	-0.36	0.17

EXHIBIT 3

Exhibit showing the cumulative wealth of a 1 \$ investment (Y Axis) in equally weighted control portfolios (X Axis) of manufacturing and non-manufacturing firms, the portfolios being revised every three years.

TABLE 8 (3YR, OVERALL MFR/NON-MFR, TSE 300, 3YR)

A: Growth of \$1 cumulative investment in aggregate portfolios of manufacturing and non-manufacturing firms, revised every 3 years. Growth of \$1 cumulative investment in the TSE 300 index.

B: Average monthly returns and their standard deviations. Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$). Portfolio Beta.

A:	Year	EOL		CTRL WTD		SIZE WTD		TSE
		MFR	NON	MFR	NON	MFR	NON	
	77	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	78	1.40	1.40	1.42	1.43	1.35	1.34	1.29
	79	2.23	1.62	2.24	1.61	2.23	1.59	1.88
	80	3.09	2.41	3.07	2.42	2.93	2.34	2.44
	81	2.65	2.20	2.82	2.10	2.82	2.11	2.20
	82	2.60	2.69	2.81	2.64	2.59	2.46	2.32
	83	3.55	4.53	3.92	4.58	3.60	3.98	3.14
	84	3.03	4.75	3.43	4.77	3.31	3.98	3.06
	85	3.63	7.28	4.13	7.34	3.84	5.79	3.83
	86	3.66	8.66	4.27	8.77	4.08	6.95	4.17
	87	3.91	8.44	4.72	8.91	4.38	6.63	4.41
	88	4.58	11.02	5.44	12.21	4.98	8.73	4.90
	89	5.23	11.45	6.19	12.68	5.80	9.32	5.95
	90	4.10	7.46	4.57	7.34	4.87	7.00	5.07
	91	4.17	8.57	4.74	8.60	5.16	7.98	5.68
B:								
	Avg Retn (%)	1.02	1.39	1.09	1.40	1.17	1.39	1.17
	S.D (%)	5.93	5.53	5.97	6.03	6.32	5.74	5.07
	XS Retn (%)	0.10	0.47	0.17	0.48	0.25	0.47	0.25
	S.D. (%)	5.98	5.59	6.02	6.08	6.36	5.79	5.13
	Sharpe	0.02	0.09	0.03	0.08	0.04	0.08	0.05
	JK Z	-0.83	0.65	-0.47	0.49	-0.26	0.62	0.00
	Beta	1.04	0.80	0.99	0.99	1.10	0.86	1.00

TABLE 8 cont.

C: Average monthly returns and their standard deviations, average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

	EQL		CTRL WTD		SIZE WTD		TSE
(1976-1981)	MFR	NON	MFR	NON	MFR	NON	
Avg Retn (%)	2.27	1.73	2.38	1.62	2.39	1.71	1.83
S.D (%)	6.72	5.18	6.53	5.27	7.21	5.62	5.92
XS Retn (%)	1.21	0.67	1.32	0.56	1.33	0.65	0.77
S.D. (%)	6.83	5.31	6.64	5.40	7.29	5.73	6.03
Sharpe M.	0.18	0.13	0.20	0.10	0.18	0.11	0.13
JK Z	1.08	0.11	2.13**	-0.41	1.76	-0.26	0.00
Beta	1.08	0.68	1.00	0.66	1.11	0.73	1.00
(1982-1986)							
Avg Retn (%)	0.68	2.36	0.83	2.31	0.82	2.14	1.18
S.D (%)	5.55	5.17	5.73	5.89	6.10	5.69	4.69
XS Retn (%)	-0.19	1.49	-0.04	1.44	-0.47	1.27	0.31
S.D. (%)	5.99	5.21	5.77	5.93	6.14	5.72	4.70
Sharpe M.	-0.03	0.29	-0.01	0.24	-0.08	0.22	0.07
JK Z	-2.36**	3.41**	-1.48	2.55**	-3.44**	2.72**	0.00
Beta	1.01	0.73	0.97	0.75	1.12	0.88	1.00
(1987-1991)							
Avg Retn (%)	0.36	0.16	0.32	0.30	0.54	0.37	0.64
S.D (%)	5.49	5.93	5.60	6.55	5.63	5.77	4.74
XS Retn (%)	-0.48	-0.68	-0.52	-0.54	-0.31	-0.47	-0.22
S.D. (%)	5.52	5.97	5.63	6.59	5.65	5.80	4.76
Sharpe M.	-0.09	-0.12	-0.09	-0.08	-0.06	-0.08	-0.05
JK Z	-1.09	-1.40	-1.07	-0.70	-0.27	-0.79	
Beta	1.01	0.99	0.98	1.05	1.06	1.00	1.00

TABLE 9.1 (3YR, MFR, CTRL, EQL)

A: Growth of \$1 cumulative investment in equally weighted portfolios of manufacturing firms, revised every 3 years by ranking firms by control.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A:	Year	PTF 1	PTF 2	PTF 3	PTF 4	MFR
	77	1.00	1.00	1.00	1.00	1.00
	78	1.35	1.42	1.45	1.38	1.40
	79	2.14	2.43	2.27	2.12	2.23
	80	3.07	3.16	3.16	2.96	3.09
	81	2.32	2.41	2.94	2.98	2.65
	82	2.40	2.04	2.92	3.17	2.60
	83	3.29	2.43	4.33	4.66	3.55
	84	2.62	2.06	3.70	4.38	3.03
	85	2.97	2.60	4.67	4.96	3.63
	86	2.69	2.52	4.83	5.34	3.66
	87	2.75	2.65	5.59	5.80	3.91
	88	3.33	3.07	6.08	7.06	4.58
	89	3.83	3.55	7.10	7.55	5.23
	90	3.21	2.74	5.35	5.51	4.10
	91	3.42	2.66	5.36	5.99	4.17
B:		PTF 1	PTF 2	PTF 3	PTF 4	MFR
	Avg Retn (%)	0.94	0.77	1.17	1.21	1.02
	S.D. (%)	6.45	6.12	5.74	5.42	5.93
	XS Retn (%)	0.02	-0.14	0.24	0.29	0.10
	S.D. (%)	6.50	6.17	5.78	5.46	5.98
	Sharpe M.	0.00	-0.02	0.04	0.05	0.02
	JK Z	-1.43	-1.99	-0.18	0.15	-0.83
	Beta	1.15	1.07	1.02	0.93	1.04

TABLE 9.1 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

	1982-1985	1986-1989	1990-1993	1994-1997	1998-2000
1982-1985					
Avg. Retn (%)	2.08	2.09	2.47	2.46	2.27
S.D. (%)	7.86	6.92	6.30	5.83	6.72
XS Retn (%)	1.01	1.03	1.40	1.40	1.21
S.D. (%)	7.97	7.05	6.41	5.93	6.83
Sharpe M.	0.13	0.15	0.22	0.24	0.18
JK Z	1.27	1.12	1.02	0.92	1.08
Beta	1.27	1.12	1.02	0.92	1.08
1986-1989					
Avg. Retn (%)	0.40	0.24	0.98	1.09	0.68
S.D. (%)	5.79	5.93	5.65	4.87	5.55
XS Retn (%)	-0.46	-0.62	0.11	0.22	-0.19
S.D. (%)	5.82	5.97	5.69	4.90	5.59
Sharpe M.	-0.08	-0.10	0.02	0.04	-0.03
JK Z	-3.55**	-3.84**	-1.22	-0.47	-2.36**
Beta	1.06	1.06	1.06	0.86	1.01
1990-1993					
Avg. Retn (%)	0.57	0.25	0.31	0.34	0.36
S.D. (%)	5.81	5.53	5.24	5.50	5.49
XS Retn (%)	-0.28	-0.60	-0.53	-0.51	-0.48
S.D. (%)	5.83	5.56	5.27	5.54	5.52
Sharpe M.	-0.05	-0.11	-0.10	-0.09	-0.09
JK Z	-0.07	-1.55	-1.54	-1.10	-1.09
Beta	1.10	1.00	0.98	0.98	1.01

TABLE 9.2 (3YR, MFR, CTRL, WTD)

A: Growth of \$1 cumulative investment in size weighted portfolios of manufacturing firms, revised every three years by ranking firms by control.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A: Year	PTF 1	PTF 2	PTF 3	PTF 4	Index
77	1.00	1.00	1.00	1.00	1.00
78	1.34	1.43	1.37	1.24	1.35
79	1.98	2.54	2.29	2.12	2.23
80	2.59	3.65	3.12	2.35	2.93
81	2.02	3.58	3.17	2.51	2.82
82	2.07	2.53	3.12	2.65	2.59
83	2.89	3.39	4.40	3.71	3.60
84	2.59	3.18	3.96	3.51	3.31
85	3.12	4.00	4.31	3.94	3.84
86	3.28	4.06	4.69	4.29	4.08
87	4.05	3.75	5.30	4.43	4.38
88	4.83	4.24	5.35	5.51	4.98
89	5.56	5.48	6.49	5.68	5.80
90	4.83	4.86	5.73	4.04	4.87
91	4.53	5.60	6.54	3.98	5.16
B:	PTF 1	PTF 2	PTF 3	PTF 4	Index
Avg Retn (%)	1.10	1.26	1.31	1.00	1.17
S.D. (%)	6.32	6.74	6.21	6.05	6.32
XS Retn (%)	0.18	0.34	0.39	0.08	0.25
S.D. (%)	6.37	6.77	6.24	6.07	6.36
Sharpe M.	0.03	0.05	0.06	0.01	0.04
JK Z	-0.72	0.03	0.49	-0.79	-0.26
Beta	1.15	1.15	1.12	0.99	1.10

TABLE 9.2 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

	1972-79	1980-89	1990-99	2000-09	2010-19
Avg. Retn (%)	1.17	3.03	2.66	2.15	2.39
S.D. (%)	7.04	8.29	6.86	6.70	7.21
XS Retn (%)	0.65	1.97	1.60	1.09	1.33
S.D. (%)	7.16	8.37	6.95	6.75	7.29
Sharpe M.	0.09	0.24	0.23	0.16	0.18
JK Z	-1.49	3.49**	4.47**	0.85	1.76
Beta	1.13	1.28	1.10	0.95	1.11
Avg. Retn (%)	0.98	0.42	0.82	1.06	0.82
S.D. (%)	5.98	6.56	6.00	5.98	6.10
XS Retn (%)	0.10	-0.45	-0.04	0.19	-0.47
S.D. (%)	6.01	6.62	6.04	6.01	6.14
Sharpe M.	0.02	-0.07	-0.01	0.03	-0.08
JK Z	-1.58	-2.67**	-1.93**	-0.79	-3.44**
Beta	1.17	1.10	1.12	1.07	1.12
Avg. Retn (%)	0.73	0.67	0.73	0.02	0.54
S.D. (%)	6.11	5.22	5.79	5.47	5.63
XS Retn (%)	-0.12	-0.17	-0.12	-0.83	-0.31
S.D. (%)	6.13	5.23	5.80	5.50	5.65
Sharpe M.	-0.02	-0.03	-0.02	-0.15	-0.06
JK Z	0.84	0.42	0.85	-2.19**	-0.27
Beta	1.18	1.01	1.13	0.93	1.06

TABLE 9.3 (3YR, NON-MFR, CTRL, EQL)

A: Growth of \$1 cumulative investment in equally weighted portfolios of non-manufacturing firms, revised every three years by ranking firms by control.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$). Portfolio Beta.

A	Year	PTF 1	PTF 2	PTF 3	PTF 4	Index
	77	1.00	1.00	1.00	1.00	1.00
	78	1.30	1.35	1.54	1.38	1.40
	79	1.51	1.61	1.89	1.46	1.62
	80	2.20	2.71	2.46	2.09	2.41
	81	2.41	2.23	2.18	1.80	2.20
	82	2.98	2.53	2.26	2.71	2.69
	83	4.82	3.89	3.42	5.50	4.53
	84	5.35	4.06	3.19	5.33	4.75
	85	7.66	6.35	5.14	8.19	7.28
	86	8.81	6.91	6.31	11.17	8.66
	87	7.70	6.46	7.07	11.06	8.44
	88	9.65	8.96	8.98	14.96	11.02
	89	11.09	8.81	7.66	18.30	11.45
	90	7.85	5.20	4.89	13.00	7.46
	91	9.33	5.28	5.31	15.70	8.57
B		PTF 1	PTF 2	PTF 3	PTF 4	Index
	Avg Retn (%)	1.46	1.14	1.16	1.83	1.39
	S.D. (%)	5.05	5.40	5.63	6.02	5.53
	XS Retn (%)	0.54	0.22	0.24	0.90	0.47
	S.D. (%)	5.09	5.46	5.70	6.08	5.59
	Sharpe M.	0.11	0.04	0.04	0.15	0.09
	JK Z	1.05	-0.14	-0.14	1.66	0.65
	Beta	0.73	0.75	0.88	0.82	0.80

TABLE 9.3 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTT} = Sh_{TSE(0)}$), Portfolio Beta.

	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009
1985-1989					
Avg. Retn (%)	1.96	1.80	1.79	1.36	1.73
S.D. (%)	5.02	5.00	5.66	5.18	5.18
XS Retn (%)	0.90	0.74	0.73	0.30	0.67
S.D. (%)	5.12	5.14	5.78	5.31	5.31
Sharpe M	0.18	0.15	0.13	0.06	0.13
JK Z	0.94	0.32	0.01	-1.34	0.11
Beta	0.64	0.61	0.79	0.68	0.68
1990-1994					
Avg. Retn (%)	2.28	2.01	1.89	3.27	2.36
S.D. (%)	4.48	4.73	4.73	6.50	5.17
XS Retn (%)	1.40	1.13	1.01	2.40	1.49
S.D. (%)	4.52	4.76	4.79	6.53	5.21
Sharpe M	0.31	0.24	0.21	0.37	0.29
JK Z	3.92**	3.09**	2.74	4.00**	3.41**
Beta	0.65	0.75	0.77	0.75	0.73
1995-1999					
Avg. Retn (%)	0.24	-0.26	-0.08	0.75	0.16
S.D. (%)	5.44	6.10	6.29	5.96	5.93
XS Retn (%)	-0.60	-1.11	-0.93	-0.10	-0.68
S.D. (%)	5.46	6.14	6.34	5.99	5.97
Sharpe M	-0.11	-0.18	-0.15	-0.02	-0.12
JK Z	-1.33	-2.29**	-2.20**	0.69	-1.40
Beta	0.91	0.91	1.09	1.06	0.99

TABLE 9.4 (3YR, NON-MFR, CTRL, WTD)

A: Growth of \$1 cumulative investment in size weighted portfolios of non-manufacturing firms, revised every three years by ranking firms by control.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSEXX}$), Portfolio Beta.

A	Yr	FTF 1	FTF 2	FTF 3	FTF 4	FTF 5
	77	1.00	1.00	1.00	1.00	1.00
	78	1.11	1.36	1.47	1.40	1.34
	79	1.35	1.63	1.93	1.45	1.59
	80	1.93	2.68	2.69	2.06	2.34
	81	2.01	2.40	2.28	1.75	2.11
	82	2.37	2.92	2.23	2.33	2.46
	83	3.70	4.43	3.65	4.15	3.98
	84	3.50	4.77	3.34	4.32	3.98
	85	4.46	7.56	5.01	6.14	5.79
	86	5.19	8.37	6.92	7.31	6.95
	87	4.59	7.50	7.67	6.77	6.63
	88	5.95	11.49	8.98	8.48	8.73
	89	7.52	11.76	7.76	10.25	9.32
	90	5.62	8.39	5.61	8.36	7.00
	91	6.45	9.32	5.77	10.36	7.98
B		FTF 1	FTF 2	FTF 3	FTF 4	FTF 5
	Avg Retn (%)	1.25	1.50	1.23	1.57	1.39
	S.D. (%)	5.36	5.75	5.97	5.93	5.74
	XS Retn (%)	0.33	0.58	0.30	0.65	0.47
	S.D. (%)	5.40	5.79	6.03	5.97	5.79
	Sharpe M.	0.06	0.10	0.05	0.11	0.08
	JK Z	0.25	0.99	0.06	1.04	0.62
	Beta	0.77	0.86	1.00	0.82	0.86

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TABLE 9.4 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

C:	PTF 1	PTF 2	PTF 3	PTF 4	PTF 5
1978-81					
Avg. Retn (%)	1.62	2.02	1.90	1.29	1.71
S.D. (%)	5.75	6.07	5.87	4.87	5.62
XS Retn (%)	0.56	0.96	0.83	0.23	0.65
S.D. (%)	5.84	6.19	5.99	5.00	5.73
Sharpe M.	0.10	0.16	0.14	0.05	0.11
JK Z	-0.54	0.53	0.32	-1.37	-0.26
Beta	0.71	0.78	0.86	0.59	0.73
1982-1986					
Avg. Retn (%)	1.72	2.22	2.03	2.62	2.14
S.D. (%)	5.15	4.93	5.81	6.79	5.69
XS Retn (%)	0.84	1.34	1.15	1.74	1.27
S.D. (%)	5.18	4.95	5.88	6.81	5.72
Sharpe M.	0.16	0.27	0.20	0.26	0.22
JK Z	1.60	3.68**	2.91**	3.01**	2.72
Beta	0.75	0.78	1.03	0.97	0.88
1987-1991					
Avg. Retn (%)	0.50	0.37	-0.10	0.75	0.37
S.D. (%)	5.24	6.14	6.06	5.71	5.77
XS Retn (%)	-0.35	-0.48	-0.96	-0.10	-0.47
S.D. (%)	5.26	6.17	6.10	5.72	5.80
Sharpe M.	-0.07	-0.08	-0.16	-0.02	-0.08
JK Z	-0.41	-0.67	-3.15	0.62	-0.79
Beta	0.85	1.04	1.14	0.98	1.00

TABLE 9.5 (3YR, MFR, SIZE, EQL)

A: Growth of \$1 cumulative investment in equally weighted portfolios of manufacturing firms, revised every three years by ranking firms by size.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A	Year	PTF 1	PTF 2	PTF 3	PTF 4	MFR
	77	1.00	1.00	1.00	1.00	1.00
	78	1.60	1.26	1.41	1.33	1.40
	79	2.38	2.14	2.23	2.15	2.23
	80	3.46	2.78	3.34	2.77	3.09
	81	2.75	2.20	2.87	2.78	2.65
	82	3.09	2.01	2.62	2.68	2.60
	83	4.18	2.83	3.36	3.83	3.55
	84	3.08	2.44	3.10	3.50	3.03
	85	3.79	2.73	3.91	4.08	3.63
	86	3.51	2.31	4.36	4.44	3.66
	87	3.81	2.54	4.34	4.95	3.91
	88	4.32	2.87	5.35	5.79	4.58
	89	5.29	3.09	5.96	6.59	5.23
	90	3.94	2.24	4.95	5.27	4.10
	91	4.15	2.41	4.82	5.30	4.17
B		PTF 1	PTF 2	PTF 3	PTF 4	MFR
	Avg Retn (%)	1.02	0.73	1.11	1.17	1.02
	S.D. (%)	5.94	6.42	5.91	5.92	5.93
	XS Retn (%)	0.10	-0.18	0.19	0.25	0.10
	S.D. (%)	6.00	6.46	5.96	5.96	5.98
	Sharpe M.	0.02	-0.03	0.03	0.04	0.02
	JK Z	-0.65	-1.91**	-0.54	-0.31	-0.83
	Beta	0.92	1.08	1.06	1.11	1.04

TABLE 9.5 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

C	PTF 1	PTF 2	PTF 3	PTF 4	PTF 5
1970-83					
Avg. Retn (%)	2.31	1.95	2.47	2.36	2.27
S.D. (%)	6.12	7.62	7.00	6.61	6.72
XS Retn (%)	1.25	0.89	1.40	1.30	1.21
S.D. (%)	6.27	7.72	7.10	6.70	6.83
Sharpe M.	0.20	0.12	0.20	0.19	0.18
JK Z	1.85**	-0.45	3.64**	3.60**	2.10**
Beta	0.90	1.21	1.14	1.07	1.08
1983-1996					
Avg. Retn (%)	0.56	0.25	0.83	0.94	0.68
S.D. (%)	5.65	6.11	5.37	5.81	5.55
XS Retn (%)	-0.31	-0.61	-0.03	0.07	-0.19
S.D. (%)	5.68	6.15	5.42	5.85	5.59
Sharpe M.	-0.05	-0.10	-0.01	0.01	-0.03
JK Z	-1.98**	-3.63**	-1.80**	-2.18**	-2.36**
Beta	0.83	1.08	0.99	1.17	1.01
1987-1991					
Avg. Retn (%)	0.46	0.22	0.31	0.44	0.36
S.D. (%)	6.03	5.58	5.37	5.38	5.49
XS Retn (%)	-0.38	-0.62	-0.53	-0.41	-0.48
S.D. (%)	6.06	5.62	5.39	5.41	5.52
Sharpe M.	-0.06	-0.11	-0.10	-0.08	-0.09
JK Z	-0.39	-1.33	-1.53	-1.29	-1.09
Beta	1.03	0.93	1.01	1.07	1.01

TABLE 9.6 (3YR, MFR, SIZE, WTD)

A: Growth of \$1 cumulative investment in control weighted portfolios of manufacturing firms, revised every three years by ranking firms by size.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A: Year	PTF 1	PTF 2	PTF 3	PTF 4	MFR
77	1.00	1.00	1.00	1.00	1.00
78	1.71	1.28	1.36	1.33	1.42
79	2.56	2.09	2.12	2.18	2.24
80	3.60	2.81	3.26	2.60	3.07
81	3.01	2.33	2.94	2.98	2.82
82	3.33	2.25	2.77	2.88	2.81
83	4.37	3.35	3.84	4.12	3.92
84	3.35	2.93	3.53	3.90	3.43
85	4.32	3.26	4.51	4.41	4.13
86	4.30	2.94	5.11	4.74	4.27
87	5.40	3.30	5.30	4.86	4.72
88	5.83	3.85	6.43	5.63	5.44
89	7.28	4.08	7.15	6.23	6.19
90	4.80	3.05	5.67	4.74	4.57
91	5.28	3.18	5.69	4.79	4.74
B:	PTF 1	PTF 2	PTF 3	PTF 4	MFR
Avg Retn (%)	1.16	0.88	1.21	1.11	1.09
S.D. (%)	5.86	6.30	5.81	5.97	5.97
XS Retn (%)	0.24	-0.03	0.29	0.19	0.17
S.D. (%)	5.92	6.35	5.85	6.00	6.02
Sharpe M.	0.04	-0.01	0.05	0.03	0.03
JK Z	-0.11	-1.29	0.03	-0.51	-0.47
Beta	0.84	1.05	1.02	1.06	0.99

TABLE 9.6 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

	PTF 1	PTF 2	PTF 3	PTF 4	PTF 5
1976-81					
Avg. Retn (%)	2.49	2.02	2.50	2.52	2.38
S.D. (%)	5.80	7.02	6.74	6.69	6.53
XS Retn (%)	1.42	0.96	1.44	1.46	1.32
S.D. (%)	5.97	7.13	6.83	6.76	6.64
Sharpe M.	0.24	0.14	0.21	0.22	0.20
JK Z	2.37**	0.30	3.57**	2.75**	2.13**
Beta	0.80	1.10	1.08	1.02	1.00
1982-1986					
Avg. Retn (%)	0.74	0.56	1.06	0.94	0.83
S.D. (%)	5.62	6.14	5.34	5.91	5.73
XS Retn (%)	-0.12	-0.30	0.19	0.07	-0.04
S.D. (%)	5.66	6.18	5.39	5.94	5.77
Sharpe M.	-0.02	-0.05	0.04	0.01	-0.01
JK Z	-1.23	-2.72**	-0.72	-1.61	-1.48
Beta	0.68	1.11	0.97	1.14	0.97
1987-1991					
Avg. Retn (%)	0.52	0.29	0.32	0.15	0.32
S.D. (%)	6.06	5.81	5.33	5.28	5.60
XS Retn (%)	-0.33	-0.55	-0.52	-0.69	-0.52
S.D. (%)	6.10	5.85	5.36	5.30	5.63
Sharpe M.	-0.05	-0.09	-0.10	-0.13	-0.09
JK Z	-0.17	-0.91	-1.35	-2.66**	-1.07
Beta	1.03	0.92	0.98	1.01	0.98

TABLE 9.7 (3YR, NON-MFR, SIZE, EQL)

A: Growth of \$1 cumulative investment in equally weighted portfolios of non-manufacturing firms, revised every three years by ranking firms by size.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A:	Year	PTF 1	PTF 2	PTF 3	PTF 4	NON
	77	1.00	1.00	1.00	1.00	1.00
	78	1.57	1.46	1.27	1.29	1.40
	79	1.74	1.80	1.42	1.53	1.62
	80	2.60	2.81	1.82	2.39	2.41
	81	2.23	2.64	1.61	2.33	2.20
	82	2.38	3.80	1.77	2.82	2.69
	83	4.05	7.14	2.50	4.42	4.53
	84	3.61	8.42	2.23	4.75	4.75
	85	5.96	13.03	3.64	6.50	7.28
	86	8.84	14.35	3.78	7.65	8.66
	87	9.04	13.98	4.03	6.69	8.44
	88	12.34	17.70	5.29	8.75	11.02
	89	12.87	17.90	5.36	9.66	11.45
	90	8.19	8.95	4.06	7.45	7.46
	91	9.47	8.98	4.68	8.72	8.57
B:		PTF 1	PTF 2	PTF 3	PTF 4	NON
	Avg Retn (%)	1.50	1.46	1.08	1.43	1.39
	S.D. (%)	5.55	5.50	5.71	5.26	5.53
	XS Retn (%)	0.58	0.54	0.16	0.51	0.47
	S.D. (%)	5.62	5.55	5.76	5.30	5.59
	Sharpe M.	0.10	0.10	0.03	0.10	0.09
	JK Z	0.89	0.71	-0.46	1.02	0.65
	Beta	0.75	0.66	0.92	0.84	0.80

TABLE 9.7 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTF} = SH_{TSE300}$), Portfolio Beta.

C	FTX 1	FTX 2	FTX 3	FTX 4	Beta
1970-1981					
Avg. Retn	1.82	2.14	1.13	1.90	1.73
S.D.	5.34	4.59	5.22	5.24	5.18
XS Retn	0.76	1.08	0.07	0.84	0.67
S.D.	5.49	4.73	5.32	5.34	5.31
Sharpe M.	0.14	0.23	0.01	0.16	0.13
JK Z	0.19	1.66	-2.96**	0.68	0.11
Beta	0.64	0.54	0.77	0.74	0.68
1982-1994					
Avg. Retn	2.44	2.95	1.59	2.12	2.36
S.D.	5.07	4.52	5.86	4.93	5.17
XS Retn	1.57	2.08	0.72	1.24	1.49
S.D.	5.14	4.54	5.89	4.96	5.21
Sharpe M.	0.31	0.46	0.12	0.25	0.29
JK Z	3.39**	4.95**	1.31	3.28**	3.41**
Beta	0.64	0.49	1.05	0.78	0.73
1995-1998					
Avg. Retn	0.30	-0.56	0.54	0.37	0.16
S.D.	6.02	6.45	5.98	5.51	5.93
XS Retn	-0.55	-1.42	-0.31	-0.47	-0.68
S.D.	6.07	6.49	6.01	5.53	5.97
Sharpe M.	-0.09	-0.22	-0.05	-0.08	-0.12
JK Z	-0.86	-2.83	-0.11	-1.11	-1.40
Beta	0.98	0.94	0.95	1.03	0.99

TABLE 9.8 (3YR, NON-MFR, SIZE, WTD)

A: Growth of \$1 cumulative investment in control weighted portfolios of non-manufacturing firms, revised every three years by ranking firms by size.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A	Year	PTF 1	PTF 2	PTF 3	PTF 4	NON
	77	1.00	1.00	1.00	1.00	1.00
	78	1.54	1.46	1.25	1.47	1.43
	79	1.62	1.90	1.29	1.63	1.61
	80	2.22	3.03	1.71	2.70	2.42
	81	1.86	2.61	1.38	2.53	2.10
	82	1.93	4.04	1.53	3.04	2.64
	83	3.23	8.22	2.05	4.81	4.58
	84	2.82	9.37	1.75	5.13	4.77
	85	4.79	14.59	2.75	7.24	7.34
	86	7.49	16.61	2.74	8.22	8.77
	87	8.31	16.90	2.99	7.43	8.91
	88	12.73	23.24	3.62	9.23	12.21
	89	14.83	22.16	3.36	10.35	12.68
	90	8.90	9.40	2.88	8.19	7.34
	91	11.72	9.76	3.03	9.89	8.60
B		PTF 1	PTF 2	PTF 3	PTF 4	NON
	Avg Retn (%)	1.66	1.57	0.85	1.51	1.40
	S.D. (%)	6.12	6.49	6.16	5.29	6.03
	XS Retn (%)	0.74	0.65	-0.06	0.59	0.48
	S.D. (%)	6.20	6.54	6.21	5.33	6.08
	Sharpe M.	0.12	0.10	-0.01	0.11	0.08
	JK Z	1.12	0.70	-1.20	1.22	0.49
	Beta	0.80	0.70	0.95	0.80	0.81

TABLE 9.8 cont.

C: Average monthly portfolio returns and their standard deviations, average monthly portfolio excess returns and their standard deviation, Sharpe measure and JK Test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

C	PTF 1	PTF 2	PTF 3	PTF 4	PTF 5
1978-81					
Avg. Retn (%)	1.44	2.15	0.81	2.08	1.62
S.D. (%)	5.47	5.19	5.25	5.22	5.27
XS Retn (%)	0.38	1.08	-0.25	1.02	0.56
S.D. (%)	5.62	5.33	5.37	5.33	5.40
Sharpe M.	0.07	0.20	-0.05	0.19	0.10
JK Z	-0.92	1.23	-3.12**	1.20	-0.41
Beta	0.62	0.59	0.77	0.67	0.66
1982-1985					
Avg. Retn (%)	2.49	3.28	1.37	2.11	2.31
S.D. (%)	5.49	5.85	7.00	5.05	5.89
XS Retn (%)	1.62	2.41	0.50	1.23	1.44
S.D. (%)	5.56	5.85	7.04	5.07	5.93
Sharpe M.	0.29	0.41	0.07	0.24	0.24
JK Z	3.17**	3.82**	0.12	2.89**	2.55**
Beta	0.68	0.42	1.17	0.74	0.75
1987-1991					
Avg. Retn (%)	1.00	-0.60	0.35	0.46	0.30
S.D. (%)	7.13	7.45	5.99	5.50	6.55
XS Retn (%)	0.15	-1.45	-0.49	-0.38	-0.54
S.D. (%)	7.18	7.50	6.01	5.52	6.59
Sharpe M.	0.02	-0.19	-0.08	-0.07	-0.08
JK Z	1.28	-2.37**	-0.72	-0.67	-0.70
Beta	1.15	1.06	0.98	1.03	1.05

Table 9.9 (3YR, MFR, SIZE)

A: Table comparing the cumulative wealth of equally weighted v/s control weighted portfolios of manufacturing firms, revised every three years by ranking firms by size.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: ShPTF = ShTSE300$), Portfolio Beta.

A:Year	FIT 1		FIT 2		FIT 3		FIT 4	
	EQL	WTD	EQL	WTD	EQL	WTD	EQL	WTD
77	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
78	1.60	1.73	1.26	1.28	1.41	1.39	1.33	1.35
79	2.38	2.58	2.14	2.08	2.23	2.15	2.15	2.18
80	3.46	3.80	2.78	2.81	3.34	3.29	2.77	2.80
81	2.75	2.81	2.20	2.23	2.87	2.84	2.78	2.80
82	3.09	3.29	2.01	2.02	2.62	2.77	2.68	2.68
83	4.18	4.27	2.83	2.85	3.36	3.35	3.83	3.83
84	3.08	3.39	2.44	2.49	3.10	3.20	3.50	3.50
85	3.79	4.12	2.73	2.86	3.91	4.21	4.08	4.21
86	3.51	4.30	2.31	2.94	4.36	4.11	4.44	4.29
87	3.81	4.48	2.54	3.38	4.34	5.18	4.95	4.88
88	4.32	4.69	2.87	3.48	5.35	4.49	5.79	5.45
89	5.29	5.28	3.09	4.01	5.96	5.14	6.59	6.28
90	3.94	4.89	2.24	3.05	4.95	5.87	5.27	4.74
91	4.15	5.28	2.41	3.18	4.82	5.80	5.30	4.97
B:	FIT 1		FIT 2		FIT 3		FIT 4	
ARet	1.02	1.00	0.73	0.88	1.11	1.01	1.17	1.11
S.D.	5.94	5.98	6.42	6.58	5.91	5.81	5.92	5.95
XSRet	0.10	0.02	-0.18	-0.02	0.19	0.20	0.25	0.16
S.D.	6.00	5.99	6.46	6.28	5.96	5.88	5.96	6.00
Sharpe	0.02	0.01	-0.03	-0.01	0.03	0.03	0.04	0.02
JK Z	-0.65	-0.11	-1.91**	-1.28	-0.54	-0.09	-0.31	-0.51
Beta	0.92	0.94	1.08	1.09	1.06	1.08	1.11	1.09

Table 9.10 (3YR, NON, SIZE)

A: Table comparing the cumulative wealth of equally weighted v/s control weighted portfolios of non-manufacturing firms, revised every three years by ranking firms by size.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: ShPTF = ShTSE300$), Portfolio Beta.

A:Year	PTF 1		PTF 2		PTF 3		PTF 4	
	EQL	WTD	EQL	WTD	EQL	WTD	EQL	WTD
77	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
78	1.57	1.34	1.46	1.40	1.27	1.29	1.29	1.42
79	1.74	1.52	1.80	1.90	1.42	1.29	1.53	1.42
80	2.60	2.22	2.81	3.09	1.82	1.71	2.39	2.71
81	2.23	1.86	2.64	2.61	1.61	1.88	2.33	2.80
82	2.38	1.93	3.80	4.04	1.77	2.05	2.82	3.10
83	4.05	3.29	7.14	8.22	2.50	2.85	4.42	5.02
84	3.61	2.82	8.42	9.37	2.23	2.70	4.75	5.09
85	5.96	4.78	13.03	14.59	3.64	3.95	6.50	7.04
86	8.84	7.40	14.35	16.01	3.78	4.24	7.65	8.01
87	9.04	8.31	13.98	15.99	4.03	4.40	6.69	7.40
88	12.34	12.73	17.70	20.24	5.29	5.80	8.75	9.08
89	12.87	14.83	17.90	20.16	5.36	5.76	9.66	10.05
90	8.19	8.90	8.95	9.40	4.06	4.30	7.45	8.00
91	9.47	11.72	8.98	9.76	4.68	5.00	8.72	9.00
B:	PTF 1		PTF 2		PTF 3		PTF 4	
ARet	1.50	1.45	1.46	1.37	1.08	0.87	1.43	1.42
S.D.	5.55	4.33	5.50	6.40	5.71	6.05	5.26	6.00
XSRet	0.58	0.79	0.54	0.05	0.16	0.00	0.51	0.00
S.D.	5.62	4.30	5.55	6.35	5.76	6.20	5.30	6.00
Sharpe	0.10	0.12	0.10	0.00	0.03	-0.01	0.10	0.00
JK Z	0.89	1.12	0.71	0.70	-0.46	-1.30	1.02	1.00
Beta	0.75	0.80	0.66	0.73	0.92	0.90	0.84	0.80

TABLE 10 (3YR, NON-PARAMETRIC)

Table showing, for a 3 year portfolio revision strategy, the proportion (p) of the number of times the monthly return of $R_{it} > R_{jt}$ over the period Jan 1978 to Dec 1991 (N = 168), the proportion q being equal to 1 - p, and the t statistic for the null hypothesis $H_0: p_i > p_j$.

R_i	$R_j > R_i$	$R_k > R_j$	$R_l > R_k$		R_i	$R_j > R_i$	$R_k > R_j$	$R_l > R_k$
MUT. CTRL. ROL					MUT. CTRL. VALUE WTD			
p	0.47	0.53	0.47		p	0.53	0.50	0.44
q	0.53	0.47	0.53		q	0.47	0.50	0.56
t	-0.77	0.93	0.77		t	0.92	0.00	-1.39
MUT. CTRL. ROL					MUT. CTRL. VALUE WTD			
p	0.45	0.52	0.54		p	0.48	0.51	0.54
q	0.55	0.48	0.46		q	0.52	0.49	0.46
t	-1.08	0.77	1.24		t	-0.30	0.46	1.08
MUT. ROL ROL					MUT. ROL CTRL. WTD			
p	0.49	0.57	0.48		p	0.49	0.57	0.48
q	0.51	0.43	0.52		q	0.51	0.43	0.52
t	-0.15	2.03**	-0.46		t	-0.15	2.03**	-0.30
MUT. ROL ROL					MUT. ROL CTRL. WTD			
p	0.48	0.44	0.52		p	0.47	0.46	0.53
q	0.52	0.56	0.48		q	0.53	0.54	0.47
t	-0.46	-1.39	0.61		t	-0.77	-0.92	0.92

TABLE 11 (3YR, Test of difference between mean portfolio returns)

Table showing, for a three year portfolio revision strategy, the difference between the mean returns ($\mu_i - \mu_j$) of two portfolios (P_i and P_j), the standard error (σ) of the difference between mean portfolio returns, and the t statistic for the hypothesis $H_0: \mu_i = \mu_j$.

	P. 1	P. 2	N. 3			P. 1	P. 2	N. 3
MVR, CTR, EOL					MVR, CTR, VALR, VTR			
$\mu_i - \mu_j$	-0.16	0.39	0.04		$\mu_i - \mu_j$	0.15	0.06	-0.31
σ	0.68	0.64	0.60		σ	0.71	0.70	0.66
t	-0.24	0.60	0.07		t	0.22	0.08	-0.46
MVR, CTR, EOL					MVR, CTR, VALR, VTR			
$\mu_i - \mu_j$	-0.32	0.02	0.67		$\mu_i - \mu_j$	0.24	-0.27	0.34
σ	0.57	0.60	0.63		σ	0.60	0.63	0.64
t	-0.56	0.03	1.05		t	0.40	-0.42	0.53
MVR, EOL, EOL					MVR, EOL, CTR, VTR			
$\mu_i - \mu_j$	-0.29	0.38	0.05		$\mu_i - \mu_j$	-0.27	0.32	-0.09
σ	0.67	0.67	0.64		σ	0.66	0.66	0.64
t	-0.43	0.57	0.08		t	-0.41	0.49	-0.15
MVR, EOL, EOL					MVR, EOL, CTR, VTR			
$\mu_i - \mu_j$	-0.03	-0.37	0.35		$\mu_i - \mu_j$	-0.09	-0.72	0.66
σ	0.60	0.61	0.60		σ	0.68	0.69	0.62
t	-0.05	-0.61	0.58		t	-0.13	-1.04	1.05

TABLE 12.1 (MFR, NON-JAN, CTRL, EQL)

A: Growth of \$1 cumulative investment in equally weighted portfolios of manufacturing firms, revised annually by ranking firms by control, disregarding the returns in the month of January.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A	PTF 1	PTF 2	PTF 3	PTF 4	MFR
77	1.00	1.00	1.00	1.00	1.00
78	1.47	1.48	1.54	1.48	1.49
79	2.32	2.29	2.36	2.19	2.29
80	2.63	2.80	2.96	2.63	2.76
81	2.05	2.17	2.72	2.69	2.41
82	2.17	2.11	2.95	2.92	2.54
83	2.35	2.45	3.65	3.72	3.04
84	1.89	2.17	3.22	3.44	2.68
85	2.00	2.47	3.36	3.50	2.83
86	1.99	2.17	3.86	3.53	2.89
87	1.79	2.05	3.96	3.61	2.85
88	2.08	2.30	4.73	4.38	3.37
89	2.12	2.31	5.12	4.20	3.44
90	1.93	1.83	4.17	3.22	2.79
91	2.08	1.80	4.55	3.72	3.04
B	PTF 1	PTF 2	PTF 3	PTF 4	MFR
Avg Retn (%)	0.67	0.57	1.14	1.01	0.85
S.D. (%)	6.23	6.16	5.63	5.51	5.88
XS Retn (%)	-0.24	-0.34	0.22	0.08	-0.06
S.D. (%)	6.27	6.21	5.69	5.55	5.93
Sharpe M.	-0.04	-0.06	0.04	0.02	-0.01
JK Z	-2.63**	-2.91**	-0.29	-0.86	-1.72**
Beta	1.13	1.10	1.04	0.97	1.06

TABLE 12.2 (NON, NON-JAN, CTRL, EQL)

A: Growth of \$1 cumulative investment in equally weighted portfolios of non-manufacturing firms, revised annually by ranking firms by control, disregarding the returns in the month of January.

B: Average monthly returns and their standard deviation, Average monthly excess returns and their standard deviation, Sharpe measure and JK test ($H_0: Sh_{PTF} = Sh_{TSE300}$), Portfolio Beta.

A:	Year	PTF 1	PTF 2	PTF 3	PTF 4	INDEX
	77	1.00	1.00	1.00	1.00	1.00
	78	1.43	1.25	1.57	1.42	1.42
	79	1.66	1.37	1.89	1.44	1.59
	80	2.32	2.08	2.31	1.81	2.13
	81	2.44	1.77	2.02	1.44	1.92
	82	3.07	2.09	2.59	1.79	2.39
	83	4.72	2.96	4.34	2.55	3.64
	84	4.95	3.09	4.23	2.54	3.70
	85	6.73	4.56	6.36	3.51	5.29
	86	7.32	4.81	8.64	3.81	6.15
	87	6.21	4.56	9.22	3.76	5.94
	88	8.23	5.72	12.52	4.72	7.80
	89	9.19	5.47	12.01	4.86	7.88
	90	7.11	3.79	8.44	3.89	5.81
	91	7.25	4.96	9.09	4.58	6.47
B:		PTF 1	PTF 2	PTF 3	PTF 4	INDEX
	Avg Retn (%)	1.42	1.17	1.61	1.14	1.33
	S.D. (%)	5.10	5.28	5.82	5.34	5.38
	XS Retn (%)	0.50	0.25	0.69	0.21	0.41
	S.D. (%)	5.14	5.34	5.89	5.41	5.44
	Sharpe M.	0.10	0.05	0.12	0.04	0.08
	JK Z	0.84	-0.02	1.33	-0.19	0.53
	Beta	0.73	0.81	0.91	0.87	0.83

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