Massey University

Doctor of Philosophy in Accounting

DIVIDEND CLIENTELES, FINANCIAL LEVERAGE CLIENTELES, AND THE DETERMINANTS OF DIVIDEND POLICY UNDER THE NEW ZEALAND FULL IMPUTATION TAX REGIME

By

Jingyu Li

This dissertation is submitted in partial fulfilment for the award of the degree of

Doctor of Philosophy in Accounting

Massey University
Auckland, New Zealand
June, 2003

ABSTRACT

Dividend Clienteles, Financial Leverage Clienteles, and the Determinants of Dividend Policy under the New Zealand Full Imputation Tax Regime

By

Jingyu Li

Under the New Zealand imputation tax regime, and in contrast to the classical tax regime, investors are to large extent indifferent between receiving their income in the form of cash dividends or capital gains. This study capitalizes on the unique features of the imputation tax regime with regard to tax neutrality, the minimum effect of discreteness, the homogeneity of investors relative to a classical tax regime, and the introduction of FITC, to examine the tax-induced dividend, financial leverage, and the joint clienteles. Furthermore, the study examines institutional and foreign investor's clienteles as an alternative explanation to the ex-dividend day share price behaviour. It also develops a cross-sectional model to explain the determinants of dividend policy.

The results indicate that share prices drop by less than the amount of dividend on the ex-dividend day. The implication of this finding is that the behaviour of share prices on the ex-dividend day is not due to tax differential between dividend and capital gains.

The distribution of dividend yields and leverage ratios is not found to exhibit a bimodal behaviour. Their correlation with the implied marginal tax rate is negative and is not significant, negating the dividend and financial leverage clientele hypotheses. In addition, companies with high dividends-low leverage, and vice versa, have approximately the same implied marginal tax rate as those firms with a high dividend yield-high leverage and firms with low dividend yield-low leverage. This suggests that there is nothing unique about the

clienteles of firms with either high dividends-high leverage or low dividends-low leverage, and does not support the joint clientele hypothesis.

The relationship between the percentage of financial institutional holdings and the degree of foreign ownership and dividend yield is not significant and does not exhibit any bimodal behaviour. This finding does not support the hypothesis that firms with high dividend yield attract more institutions (relative to retail), and more foreign (relative to domestic) investors.

To the extent that institutional (relative to retail), and foreign (relative to domestic) investors represents heterogeneous groups, the results suggest that investors heterogeneity does not affect the drop off ratio or influence the results of this study. The results are consistent with the argument that marginal investors in aggregate determine market prices by their collective activity and thus the implied marginal tax rate.

The results of the cross-sectional analysis indicate that dividend policy is determined by a firm's growth opportunities, profitability, firm's size, riskness of operating income, and firm's growth rate. These are the same fundamental factors that determine dividend policy under the classical tax regime. This suggests that regardless whether the market is small, such as the New Zealand capital market, or large, such as the USA capital market, corporate dividend policies are determined by basic fundamental factors and tax has a minor role to play. Give that the percentage of financial institution and firm size is negatively related with dividend yield, the positive and significant correlation between firm's size and the percentage of institutional holdings suggest that institutions tend to invest in large companies seeking for liquidity and willing to accept lower dividend yields in exchange for this liquidity premium.

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to my supervisor Professor Lawrence C. Rose, Head, Department of Commerce, who provided guidance and support. His encouragement enabled this thesis to be completed. I would like to express my gratitude to my advisor professor Steven F. Cahan for co-supervising the dissertation and his constructive contribution.

I am also very appreciative of the support and helpful comments from Professor John F. Pinfold. I would also like to thank Mrs. Elizabeth Stewart and Dr. Thomas O. Meyer for their proof reading.

Above all, my infinite heartfelt thanks to my husband and best friend Fayez, without him and his patience, I could never complete this degree. I dedicate this dissertation to my family, husband Fayez, son Kenan and daughter Ayyah.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

> *"Why do corporations pay dividends? Why do investors pay attention to dividends?*
>
> *Perhaps the answers to these questions are obvious. Perhaps dividends represent the return to an investor who put his money at risk in the corporation. Perhaps corporations pay dividends to reward existing shareholders, and to encourage others to buy new issues of common stock at high prices. Perhaps investors pay attention to dividends because only through dividends or the prospect of dividends do they receive a return on their investment or the chance to sell their shares at a higher price in the future. Or perhaps the answers are not so obvious. Perhaps a corporation that pays no dividends is demonstrating confidence that it has attractive investment opportunities that might be missed if it paid dividends. If it makes these investments, it may increase the value of the shares by more than the amount of the lost dividends. If that happens, its shareholders may be doubly better off. They end up with capital appreciation greater than the dividends they missed out on, and they find they are taxed at lower effective rates on capital appreciation than on dividends.*
>
> *In fact, I claim that the answers to these questions are not obvious at all. The harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just don't fit together" (Black 1976, p. 5).*

Although this observation was made by Black two decades ago financial economists are still wrestling with the dividend puzzle. Financial theory demonstrates that in the absence of taxes, dividend policy has no effect on the value of the firm. However, if taxes are introduced, then the firm can maximize the share value of some shareholders by paying no dividends. However, for other shareholders, a no-dividend policy may be suboptimal. Thus, certain shareholders may be attracted to certain firms based on the firm's dividend policy. In other words, there may be a clientele effect (Copland and Weston 1988). To date, financial theory has focused on two types of clienteles: the dividend clienteles and the financial leverage clienteles.

The dividend clientele effect was first suggested by Miller and Modigliani (1961 p.413):

> "*If, for example, the frequency distribution of corporate payout ratios happened to correspond exactly with the distribution of investor's preference for payout ratios, then the existence of these preferences would clearly lead ultimately to a situation whose implications were different, in no fundamental respect, from the perfect market case. Each corporation would tend to attract to itself a 'clientele' consisting of those preferring its particular payout ratio, but one clientele would be as good as another in terms of the valuation it would imply for the firms.*"

Dividend clienteles provide a possible explanation for management's reluctance to change established payout ratios because such changes might cause existing stockholders to incur unwanted transactions costs. Under a classical tax regime, where the effective tax rate on dividends is higher than the effective tax rate on capital gains, the existence of dividend clienteles implies that high tax bracket individuals will hold the stock of firms with a low dividend yield. Conversely, low tax bracket individuals will own shares of firms with a high dividend yield. The empirical evidence with regard to dividend clienteles is inconclusive. Elton and Gruber (1970) and Barclay (1987) provide evidence that supports tax induced dividend clienteles. In contrast, Kalay (1982), Eades, Hess, and Kim (1984), and Michaely (1991) provide evidence that suggests taxes are an unlikely explanation of the ex-dividend day behaviour of share prices.

Another type of potential clientele is the financial leverage clienteles as proposed by Miller (1977). This theory implies that low leveraged firms would find a natural clientele for their securities among investors in high tax brackets, while investors in low tax brackets would prefer highly leveraged firms. The empirical evidence on financial leverage clienteles is limited and inconclusive. The results of Kim, Lewellen, and McConnell (1979) are not supportive of a financial leverage clientele. They find a weak relationship between the implied marginal tax rate and financial leverage. However, Harris, Roenfeldt, and

Cooley (1983) find that the implied marginal tax rates are strongly, negatively correlated with corporate financial leverage.

Not only are the prior results mixed, but previous studies that examine either the dividend or financial leverage clientele theories also suffer from methodological problems. For example, earlier studies are not able to determine whether the behaviour of the stock price on the ex-dividend day is due to taxes or to other factors. Allen, Bernardo, and Welch (2000) for example provide an explanation based on institutional clienteles. On the other hand, Bali and Hite (1998) use discreteness (share prices and dividends are reported on a different basis) to explain the fact that stock prices fall by less than the dividend amount.

This study, first, extends previous work by capitalizing on the uniqueness of New Zealand's full imputation tax system when examining both the dividend and financial leverage clientele hypotheses. Unlike the classical tax system, where the effective tax rate on dividends is higher than the effective tax rate on capital gains, the New Zealand imputation tax regime provides little tax differential between dividends and capital gains[1]. There is no double taxation and investors should be indifferent (in comparison to the classical tax regime) in terms of receiving income in the form of dividends or capital gains. This feature of the New Zealand tax system provides a unique opportunity to examine the dividend clienteles' hypothesis and to draw conclusions that have implications for the classical tax system. However, if the stock price behaviour on the ex-dividend day is due to tax differentials between dividends and capital gains, then the absence of this tax differential should lead to share prices dropping by exactly the amount of the dividend paid. If share prices continue to drop by less

[1] The neutrality of the dividend imputation tax system may be influenced by the type of investors, whether arbitrageurs or a portfolio trader in which case the tax on dividend income does not equal the tax on capital gains ($t_d \neq t_g$). For a portfolio investor, the tax rate on dividend income is 33 percent ($t_d=0.33$) while the tax rate on capital gains is zero percent ($t_g=0$). The impact of an investor's type is yet to be established in the literature, the New Zealand dividend imputation tax regime can still be characterized by its neutrality as compared to the classical tax system.

than the amount of dividends, however, even under the imputation system, then the behaviour of share prices on the ex-dividend day would seem to be inconsistent with a tax differential explanation and may be due to factors other than taxes.

The interaction between dividend policy and financial leverage has also been largely ignored by previous work. Previous studies typically focus on either the dividend clientele or financial leverage clientele separately. Financial theory indicates that there is a linkage between financing decisions and investment decisions. The interaction between financial leverage and dividend policy has been documented by several studies, e.g., McCabe (1979) and Peterson and Benesh (1983) and these suggest that dividend policy may influence the decisions on how firms finance their projects and the degree of financial leverage used.

This study addresses the issue of the interaction between dividend policy and the firm's financial leverage from two different directions. First, the study examines financial leverage clienteles holding the effect of dividend clienteles constant. Under the New Zealand full imputation system corporations are able to reduce their taxable income by the amount of interest expense, but the tax advantage from using debt can not be assessed because rational investors would be indifferent between receiving tax-free fully imputed dividends or the before tax equivalent in interest income. Substituting debt for equity would therefore require the same before-tax cash flow from the firm.[2] Howard and Brown (1992) show that if the optimal dividend policy is adopted there is no scope for any further increase the value of the firm through leverage.

By using New Zealand as the setting for the empirical tests, the existence of financial leverage clienteles, if any, may be attributed to other factors other than taxes since the tax advantage from leverage is neutralized in comparison to the

[2] This explanation was suggested by Associate Professor John Pinfold.

classical tax system[3]. Second, the study takes into consideration the interaction between dividend policy and the firm's financing decisions by examining the hypothesis of joint clienteles for both dividends and financial leverage. In particular, the study identifies the implied marginal tax rate for shareholders who hold shares in companies with low dividend yields and high financial leverage, and companies with high dividend yields and low financial leverage. These are two extreme cases that have been ignored by previous research investigating dividend and financial leverage clientele effects. This study is an attempt to fill this gap.

Thus, this study hopes to contribute to the existing literature in a number of ways. First, this study capitalizes on the unique aspect of the imputation tax system due to minimal tax differentials between dividends and capital gains (in comparison to the classical tax system) in the examination of tax induced dividend clienteles. If found, the absence of dividend clienteles in this study will support tax-induced dividend clienteles as reported by USA-based research.

Second, this study makes a potential contribution by examining the financial leverage clientele in the absence of a dividend policy influence. Previous studies that examine the financial leverage clientele, fail to account for the influence of dividend policy and its impact on the firm's financial policy. Under the New Zealand imputation tax system and with minimum tax differentials between dividends and capital gains, relative to the classical tax system, the existence of leverage clientele might be attributed to tax affects and not to the influence of dividend policy.

Third, this study develops and empirically examines the joint clienteles argument. This is the situation where both financing policy and the dividend policy of the firm are considered at the same time. Several studies, for example,

[3] The estimated implied marginal tax rate (IMTR) for each company reflect the average tax rate for marginal investors and it does not differentiate among individuals, corporations or institutions, portfolio investors or arbitrageurs, and it is not the main focus of this research project.

McCabe (1979) and Peterson and Benesh (1983) point to the linkage between dividend policy and the financing decisions of the firm. Both the dividend and financial leverage clientele theories predict that low tax bracket individuals will be attracted to firms with high dividend yields and high leverage. They also predict that high tax bracket individuals will seek companies with relatively low dividend yields and low financial leverage. However, neither predicts the implied marginal tax rate (IMTR) for companies with low dividend yield-high financial leverage policies and those with high dividend yield and low financial leverage. This study examines firms with different degrees of dividend yield and financial leverage to determine their IMTR. The IMTR for firms with low dividend yields-low leverage and firms with high dividend yields-high leverage are compared. The absence of a significant difference in the implied marginal tax rate between these groups of firms would not be consistent with the joint dividend-leverage clientele argument.

Fourth, this study examines institutional investor clienteles as an alternative explanation to dividend clienteles in the absence of taxes. Allen et al. (2000) suggest that firms with high dividend yields are expected to attract a clientele of institutional investors, while firms with low dividend yields are expected to attract a clientele of retail investors. They attribute the institutional preference for high-dividend stocks to signalling, agency, and tax effects.

Under the classical tax system, the effective marginal tax rate on dividends to institutional investors is less than the marginal tax rate to individual investors. In contrast, the New Zealand tax regime can be considered less discriminatory with regard to the tax treatments of dividends and capital gains between retail investors and institutions. Under the New Zealand tax regime all capital gains recognized by actively managed funds are taxable at the corporate tax rate (currently 33 percent). Therefore, the New Zealand tax system does in fact discriminate between retail investors and institutions. The issue of investor's homogeneity is based on comparison with the classical tax regime where 70 percent of dividends received by institutions are tax exempt and the effective tax

rate on dividend income is approximately 10.5 percent (Brigham and Ehrhardt 2002). Thus, while both the classical and the imputation tax systems do discriminate between different groups of investors, the New Zealand tax regime is relatively less discriminatory and so the results of this study are less likely to be influenced by heterogeneity between institutional and retail investors. This allows the examination of the institutional clientele argument in a relatively more homogeneous tax environment to determine whether an institutional clientele effect is related to tax effects or to institutional preferences for dividends.

Fifth, this study examines the effect of the foreign investors' tax credit (FITC) on dividend and financial leverage clienteles in terms of the possible existence of foreign, or non-resident versus resident clienteles. New Zealand introduced the FITC system in 1993. The FITC allows foreign investors to have access to the imputation credit. FITC calls for providing supplementary dividends to non-resident shareholders equivalent to the level of non-resident withholding tax (NRWT) applicable to the total dividend. Thus, the introduction of FITC may increase the percentage of foreign investors seeking companies that pay relatively higher dividends.

Sixth, this study evaluates the determinants of dividend policy under the imputation tax regime. The study develops a cross-sectional model, which includes firm investment opportunities, the implied marginal tax rate, a proxy for the degree of foreign ownership, the percentage of financial institutional holdings, firm profitability, firm growth potential, the variability of operating income, and firm size as independent variables.

These objectives have important implications for corporate managers, individuals, institutional investors, and policy makers. The study will show whether dividend policy in general and taxes in particular, are major factors to be considered when firms decide on the distribution of their earnings. Whether these decisions have an impact on the value of the firm and shareholders' wealth

is also considered. In addition, the study points out the determinants that a firm should take into consideration when they make dividend policy decisions. The study attempts to indicate the extent to which dividend policy affects the choices of individual and institutional investors and what factors and firms characteristics will be considered when they make these choices. For policy makers, the research points to the impact of regulations and tax laws on the welfare and behaviour of firms and investors in response to their policies.

The research is organised into seven chapters. Chapter 2 is a review of the literature. It provides an overview of dividend payments, theories developed to explain dividend policy, tax and non-tax induced dividend and financial leverage clientele literatures. Chapter 3 focuses on the dividend imputation system under the New Zealand tax regime. It discusses the pros and cons and its uniqueness relative to the classical tax regime. It addresses how the study can capitalise on these unique aspects to develop testable hypotheses related to tax-induced dividend and financial leverage clienteles. Chapter 4 develops testable hypotheses which include tax induced dividend clienteles, financial leverage clienteles, joint clienteles hypothesis, and tests for alternative explanations such as institutional clienteles, and resident versus non-resident imputation clienteles. Chapter 5 provides data description and sampling procedures, the methods of analysis, estimation and measurements of the variables related to the IMTR. In addition, Chapter 5 provides a cross-sectional analysis of determinants of dividend policy, including a discussion of the independent variables and the specification of the regression model. Chapter 6 reports and analyses the results and discusses implications in light of the testable hypotheses developed earlier. The last chapter presents the summary of results, draws conclusions and provides suggestions for future research.

CHAPTER 2

LITERATURE REVIEW

2.1 Dividends and Dividend Policy

Dividend Policy and the Dividend Puzzle

If dividends are considered as being a significant component of the total return on common stock, the distribution of dividends would be expected to affect shareholders' wealth. However, whether dividends do affect shareholders' wealth, and in what way, has been intensely debated. Black (1976) refers to the dual questions of why do corporations pay dividends, and how are dividends priced, as the 'dividend puzzle'.

Dividends represent a return to the investor who puts her/his money at risk in the corporation. Corporations pay dividends to reward existing shareholders and to encourage others to buy new common stock issues at higher prices. Investors pay attention to dividends because through dividends, or the prospect of dividends, they receive a return on their investment or the chance to sell their shares at a higher price in the future (Black, 1976). On the other hand, a corporation that pays no dividends may be demonstrating confidence that it has attractive investment opportunities that might be missed if dividends are paid (Black, 1976). If these investments prove as profitable as expected, the value of the shares may increase by more than the lost dividend amount. If that happens, shareholders will be better off. They end up with capital gains greater than the dividends they missed and they find that they are taxed at lower effective rates on capital gains than on dividends[4]. Although Black made his comment on the

[4] In many countries, such as United States, Canada, and Australia, capital gains are taxed at a lower rate than ordinary income.

dividend puzzle more than two decades ago, it is still a puzzle that attracts researchers' attention. Is dividend policy relevant to the value of the firm? There are several competing theories.

2.2. Why Pay Dividends?

2.2.1 Agency Explanation

2.2.1.1 Shareholders and Debtholders

Ultimately, shareholders are the owners of the firm. Firms' managers should act on the owner's behalf. When the managers and shareholders declare dividend distributions the value of the firm should decline by the amount of the dividend distribution (Miller and Modigliani, 1961). If the value of the firm declines, the value of equity and possibly debt decline. When the declared dividends are distributed the debt of the firm becomes more risky, since there are fewer assets in the firm to secure the debt. Therefore, upon the distribution of dividends, the decline in the value of the firm as a whole is shared by both shareholders and debtholders. However, shareholders tend to be better off as they receive dividends and the decline in value is shared by the debtholders. On the other hand debtholders are worse off as they do not receive dividends, but they share the value decline with shareholders. This creates an agency conflict between shareholders and bondholders.

In response to this agency problem, debtholders like to retain as much of the firm value as possible until the debt is fully paid. In other words, debtholders prefer to minimise dividend payments. One method debtholders use to restrict dividend payments to shareholders is introducing both direct and indirect covenants into debt contracts. Smith and Warner (1979) examine a random sample of 87 public issues of debt registered with the Securities and Exchange Commission between January 1974 and December 1975. They observe that 90.8 percent of the bonds restrict the issuance of additional debt, 23 percent restrict dividend payments, 39.1 percent restrict merger activities and 35.6 percent constrain the firm's disposition of assets.

Kalay (1982) studies the restrictions that bondholders may impose on shareholders in order to protect their interests. He shows that typical direct dividend constraints include restrictions on the amount of dividends as a fraction of the firm's net earnings accumulated since the bonds' issuance. Restrictions on the amount of dividends as a percentage of the total proceeds from the sale of new common stock since the bonds were issued are a second typical restriction. Third, restrictions on the maximum sum payable out of the firm value that existed prior to the bonds' issuance are often observed. In addition to these direct restrictions on dividend payment there are indirect restrictions imposed on management's ability to pay dividends, such as a minimum net worth requirement.

Based on the above analysis, one would expect shareholders, who benefit from dividend payments at the expense of bondholders, to pay the maximum allowable dividends. Kalay examines the actual dividend payments and finds that companies typically maintain a substantial 'dividend slack' of about 12 percent of company value. Such slack implies that managers prefer a stable dividend policy and keep funds available in case profits temporarily decline.

2.2.1.2 Shareholders and Management

Managers are supposed to act in the best interest of the shareholders in order to maximise shareholders' wealth. However, in reality, managers have better information than shareholders and it is often difficult to monitor managerial activities. Thus, managers may choose to take a course of action, which has little to do with shareholders' interests (Jensen and Meckling, 1976).

Monitoring the performance of a firm's management is difficult and costly. Easterbrook (1984) suggests that dividends may help reduce agency costs[5]. He

[5] Agency cost is the cost associated with shareholder monitoring of management activities.

observes that when the firm has a large group of shareholders, individual shareholders have little incentive to monitor managers. A shareholder who monitors management bears all the monitoring costs while only benefiting in proportion to her/his partial ownership. Easterbrook argues that dividend payments force managers to raise funds in the financial markets more frequently in order to finance the firm's investment projects than they would without paying dividends. Therefore, dividends put managers under the pressure of outside professional, e.g., investment bankers, lawyers and accountants. These professionals, involved in the firm's financing process, have strong incentives to scrutinize the firm and monitor the management before endorsing the issue since they need to protect their own credibility, reputation and capital. In other words, management is professionally scrutinized more frequently when the firm chooses to pay dividends. Therefore, dividend paying firms' managers have fewer opportunities to behave according to their own interests. According to Easterbrook, realising the monitoring role of the capital markets concludes shareholders often insist that firms distribute dividends.

Jensen (1986) extends Easterbrook's study arguing that if the firm does not pay dividends, it may have excess cash. This money, referred to as 'free cash flow', may be used in ways that are not in the shareholders' best interest. By paying dividends the free cash flow under management's control is reduced, which reduces the probability that management will "mishandle" the firm's excess cash. Zwiebel (1996) develops a model of dynamic capital structure where managers choose a dividend payout that credibly constrains their misuse of free cash flow. Thus Jensen's and Zwiebel's studies suggest another reason why firms pay dividends, even though the effective tax rate is higher on dividends for shareholders.

2.2.2 Signalling or Information Asymmetry Explanation

It has also been recognised that the capital markets do not have as much inside information as managers. Managers may use the dividend announcement as a

vehicle to convey relevant new inside information to the market. Ross (1977) suggests that the most important assumption of the Miller and Modigliani dividend irrelevance theory was that the market knows the firm's return stream. If this is the case, changing the capital structure by altering dividend payouts may alter the market's perception. If market perception changes, the investors' perception of firm risk changes. These changes in the expected return stream leads to a change in the firm's market value. Such reactions may come from the firm's dividend policy signalling effect without any change of actual firm risk. In general, a firm that increases its dividend payout may be signalling that it has expected future cash flows that are sufficient to pay all future debt payments and dividends.

Managers may also have inside information about future prospects and choose dividend levels to signal particular information. The signal may be believable if other firms, with less favourable future prospects, cannot deceptively mimic the dividend actions of firms with good future prospects. Bhattacharya (1979), John and Williams (1985) and Miller and Rock (1985) develop models to provide empirical evidence that signalling the market through dividends is credible.

2.2.3 Institutional Investors

In 1974, the US passed ERISA, making private pension funds subject to the 'prudent man rule'[6]. The prudent man rule forces many institutional managers to invest significant asset proportions in stocks with high dividend yields. Brav and Heaton (2001) find that many institutional investors stopped holding dividend-omitting firms after ERISA was enacted. However, they also find that dividend-omitting firms under-performed dividend paying firms. Dhaliwal, Erickson, and Trezevant (1999) examine changes in institutional shareholdings

[6] The prudent man rule implies that portfolio managers should invest in companies with high dividend payments to increase the total return on their portfolio since their rewards in the short run are based on the performance of their portfolio.

around dividend initiation dates. Using a sample of 133 firms that initiate dividends in the 1982 to 1995 period, they find that 80 percent of the firms experience increases in institutional shareholdings over the three- to- nine-month period following the initiation. The average firm's institutional shareholdings increase from about 25 percent to 30 percent within one year. Perez-Gonzales (2000) directly examines the shareholders of individual firms. He classifies firms by whether their largest shareholder is an individual or an institution and finds that the former pay 30 percent fewer dividends than the latter. He also finds that when tax reform increases (decreases) dividend's taxation relative to capital gains, firms with individuals as their largest shareholder decrease (increase) dividend payouts. Poterba and Summers (1984) report a similar result for aggregate dividend behaviour in the UK over the period 1950-1983.

Allen et al. (2000) study institutional holdings from a tax viewpoint. Their explanation of institutional investor clienteles is built on two assumptions. The first assumption includes two clienteles, the untaxed institutions and taxed individuals. Due to investment size the untaxed institutions have more incentive to become informed about the firm's performance. Institutions are presumably more likely than individual investors to conduct due diligence to find out whether a particular firm is well run or poorly managed. The presence of institutional shareholdings may be associated with higher firm value because of signalling effects, agency effects, or both.

Their second assumption is that dividends are one way of attracting institutions, as common institutional charters and the prudent man rule restrictions make it difficult for many institutions to purchase investments with low dividend payouts. They show that in equilibrium, dividend-paying companies are a better investment for institutions than for individual investors because dividends are taxed for individuals but not for institutions. This tax advantage results in a higher fraction of ownership of dividend-paying firms by institutions. The implication of the two assumptions is that firms can attract more institutional

shareholdings by paying dividends and that a dividend-paying firm will perform better than a non-dividend paying firm.

2.3 Dividend Policy Theories

2.3.1 The Irrelevance Theory of Dividend Policy in a World without Taxes

Modern dividend research began with Lintner (1956). He conducts interviews with twenty-eight carefully selected companies to investigate how they determine their dividend policy. His work suggests that managers focus on the change in the existing dividend payout and not on establishing a new payout. Managers also avoid making changes to the current dividend payout if the firm cannot sustain the new payout for a long period of time. He also finds that the most important determinant of the dividend payout is the earnings change. Conversely, investment requirements have little effect on dividend policy. Overall, Lintner concludes that generally firms have flexible, but well-defined, dividend policies.

Following Lintner's (1956) study, Miller and Modigiliani conduct the first empirical study of dividend policy in 1961. Miller and Modigiliani (1961) present an argument that the value of the firm is unaffected by the firm's dividend policy in a world without taxes or transactions costs[7]. They begin by assuming that two firms are identical in every aspect except for their current period dividend payout. Streams of future cash flows from operations are identical, their planned investment outlays are identical and all future dividend payments from the second time period on are also identical.

An important question Miller and Modigliani (1961) try to answer is whether the two firms will have different values if their current period dividend payouts

[7] Miller and Modigliani assume that 1) capital markets are frictionless; 2) individuals can borrow and lend at the risk-free rate; 3) there are no costs to bankruptcy; 4) firms issue only two types of claims: risk-free debt and (risky) equity and all firms are assumed to be in the same risk class, 5) corporate taxes are the only form of government levy (i.e., there are no wealth taxes on corporations and no personal taxes), 6) all cash flow streams are perpetuities (i.e., no growth), 7)

are different. Miller and Modigliani first develop a valuation model. They assume the market-required rates of return for the two firms are the same since they have the same risk. The reason why these two firms have the same risk is because of the original assumption that the firms had identical future cash flows from operations and identical planned investment outlays. The total rate of return for the security would be the sum of dividends and capital gains divided by the purchase price of the security.

Miller and Modigliani (1961) use their valuation model to argue that in a world without taxes, the firm can choose any dividend policy whatsoever without affecting the stream of cash flows received by shareholders. The firm could choose to pay dividends in excess of cash flows from operations and still be able to undertake any planned investment. The extra funds needed are supplied by issuing new equity. On the other hand, the firm could decide to pay dividends less than the amount of cash left over from operations after making an investment. The excess cash would be used to repurchase shares. It is the availability of external financing in a world without information asymmetry, or transactions costs, which makes firm value independent of dividend policy.

Miller and Modigliani (1961) conclude that dividend policy is irrelevant to the value of a firm, i.e., it has no effect on shareholders' wealth in a world without taxes, information asymmetry or transaction costs. The key to their conclusion is that investment decisions are completely independent of dividend policy. Thus, a firm can pay any level of dividends it wishes without affecting investment decisions. The importance of their study is not only that they show that dividend policy is irrelevant in valuing the firm, but also that they provide insights about what does affect firm value. The value of the firm depends mainly on the distribution of future cash flows provided by investment projects.

---

corporate insiders and outsiders have the same information (i.e., no signaling opportunities), 8) managers always maximize shareholders' wealth (i.e., no agency costs).

Modigliani and Miller (1963) further extend their dividend policy irrelevance theory into a world with corporate taxes, but without personal taxes. They point out that a commonly made error is to implicitly assume that there is some relationship between the amount of cash flow retained in the firm and the amount of investment the firm undertakes. However, this assumption is not correct for two reasons. First, as mentioned in their 1961 study, the amount of cash flow retained has nothing to do with dividend payout. The firm can set the dividend amount at any level. Second, the investment decisions that maximise shareholders' wealth are only relevant to the market required rate of return. If the amount of cash flow retained exceeds the amount of investment, then the firm can use the excess cash to repurchase their own stock. Therefore, there is no relationship between firm value and dividend payout ratio or cash flow retention.

Although Miller and Modigliani (1961, 1963) argue that the value of the firm is not affected by dividend policy, a more "sophisticated" argument for the relationship between the value of the firm and dividend payout believes that even though the dividend decision cannot change the present value of cash payments to shareholders, it can affect the temporal pattern of payouts. Investors might view that the future dividend payments are riskier than current payments. They might prefer "one bird in the hand to two in the bush". The reason why investors may prefer the current dividend is because more investment means less cash retained by the firm. Thus, if the dividend payout is reduced in exchange for future capital gains, this will increase risk. Since the future cash flows are uncertain, the market's required rate of return in turn, increase. However, Copeland and Weston (1988) indicate that this argument is not valid because the riskness of the firm is determined by the riskness of cash flows from its investment projects, not by the way it distributes net income. An increase in dividend payout should result in a price drop on the ex-dividend day; it will not increase firm value by reducing the risk of future cash flows.

2.3.2 Dividend Policy in a World with Personal and Corporate Taxes

Miller and Modigliani's work (1961) provides the theoretical foundation for dividend research by noting that dividend policy is irrelevant in a frictionless world with perfect capital markets. In their 1963 study they confirm their dividend payout irrelevance theory with corporate taxes. Research since then has explored how market imperfections create an environment in which dividend policy may matter. For example, whether corporate dividend policy will be affected if personal taxes are taken into consideration, especially under the "classical tax system" where the personal income tax rate is higher than the capital gain tax rate. For example, Farrar and Selwyn (1967) use partial equilibrium analysis and assume that individuals attempt to maximise their after-tax income. Shareholders have two choices. They can either buy shares of an all-equity financed firm, and then borrow on a personal basis, or they can buy shares in a firm with corporate debt. The first choice is related to the form of personal, relative to corporate leverage, that is preferred. The second choice is related to the form of payment to be made by the firm. It can pay out earnings as dividends, or it can retain earnings and allow shareholders to take their income as capital gains.

Individual shareholders can sell her/his stock, realize a capital gain, pay a capital gains tax on this gain and then deduct the after-tax interest expenses on personal debt. Corporations could implement a policy of distributing cash via share repurchases in the open market. However, in reality, the Internal Revenue Services (IRS) may challenge the firms if they detect that the company will use share repurchases as a substitute for cash dividends on a regular basis.

Since investors want to maximise their after tax return, the best form of payment from corporations should be the one that is subject to the least taxation. Under the "classic tax system", the personal income tax rate is higher than the capital gain tax rate. The conclusion of the Farrar and Selwyn (1967) study is that corporations should never pay dividends. If payments are to be made to

shareholders, they should all be made through share repurchases. This way, shareholders avoid personal income tax rates on dividends received. Instead, they receive payments in the form of capital gains, which are taxed at a lower rate.

Brennan (1970) further develops the work of Farrar and Selwyn (1967). He uses a general equilibrium framework that assumes investors try to maximise their expected wealth utility. Brennan reaches a similar conclusion as Farrar and Selwyn. With regard to dividend payout, he concludes, "for a given level of risk, investors require a higher total return on a security the higher its prospective dividend yield is, because of the higher rate of tax levied on dividends than on capital gains." Brennan extends Farrar and Selwyn's argument that if two securities have exactly same level of risk, then the investor would require a higher rate of return on the security that pays high dividends since higher dividends mean higher tax payment, and consequently a lower real rate of return.

Miller and Scholes (1978) disagree with Brennan's (1970) theory and state that even if the tax on ordinary personal income is greater than the capital gains tax, many individuals may not need to pay higher than the capital gains rate on dividend income. Miller and Scholes argue that tax-exempt insurance policies can tax shelter all income (and specifically dividend income) that is not consumed. If the "marginal" shareholder is a tax-exempted entity, the implication is that some individuals may be indifferent between dividend income and capital gains (assuming the firm makes stock repurchases to pass the capital gains on to shareholders). Therefore, the firm's value may still be unrelated to its dividend policy even in a world with personal and corporate taxes. But Miller and Scholes' argument may not be relevant in the real world as most investors' marginal personal tax rates are higher than their capital gain tax rates, and corporations may not be able to freely pass capital gains to their shareholders through stock repurchases. In practice, the transaction costs and

complexity of pursuing Miller and Scholes (1978) strategies appear to be too high to make them empirically significant.

In contrast, Litzenberger and Ramaswamy (1980) find evidence of a dividend tax effect. They classify stocks into yield classes by using a monthly definition of dividend yield, rather than a long-term dividend yield definition. The Litzenberger and Ramaswamy study involves three steps. First, they estimate the systematic risk (beta) of each stock for each test month using individual data and maximum likelihood procedures. The estimation uses the market model regression. The second step uses the estimated beta for stock i during month t, and an estimate of stock i's expected dividend yield for month t, $d_{it,}$ as independent variables in a cross-sectional regression for month t. Third, they repeat the second step for every month included in the period 1936 to 1977. They find a positive and statistically significant dividend yield coefficient. They interpret this finding as showing a dividend tax effect.

Kalay and Michaely (2000) point out that Brennan's (1970) implication should show up in cross-sectional long-run returns (i.e., returns for stocks held long enough to qualify for capital gains treatment) because of cross-firm variation in dividend payouts. They argue that by using monthly returns and allowing high-dividend yield firms to be considered zero-dividend in non-dividend months, Litzenberger and Ramaswamy's (1980) approach is misdirected. Kalay and Michaely (2000) do not find cross-sectional returns or long-run return evidence that high-dividend stocks earn a tax premium. Kalay and Michaely's findings imply that the effect identified by Litzenberger and Ramaswamy occurs for short-run returns, perhaps only during the ex-dividend week.

In contrast to the Miller and Scholes' study, Masulis and Trueman (1986) model investment and dividend decisions on fairly realistic assumptions and argue that the cost of deferring dividends may be large enough to induce firms to optimally

pay cash dividends[8]. The implication of their study is that shareholders with different tax rates will not unanimously agree on the firm's investment/dividend decision. Shareholders in the high tax bracket would prefer the firm to invest more, whereas shareholders in a lower tax bracket would prefer the firm to invest less, and distribute more dividends since their after-tax return is higher if they receive the distribution in the form of dividends due to their marginal personal tax rate. This lack of unanimity, however, can be resolved if investors choose companies' stocks according to their investment preference. They can self-select into clienteles, where investors in lower tax brackets purchase stocks with high dividend payouts, versus investors in higher tax brackets who purchase stocks with low dividend payouts.

There are other implications from the Masulis and Trueman (1986) model. They observe that a firm usually does not externally finance security purchases for investment purposes. However, firms do purchase marketable securities using excess internally-generated funds. Second, they propose that firms with many profitable production opportunities will use up all their internally generated funds to fund these profitable projects; therefore, no dividends are paid. On the other hand older, more mature firms will pay dividends because not all internally-generated funds will be used by new projects. In other words, these firms do not have sufficient profitable new projects. Third, they predict mergers are likely to happen between firms where one is internally financing its profitable projects and the other is externally financed. Fourth, they argue that a decrease in a firm's current earnings should not change the investment expenditures if these projects are externally financed, however, it could decrease investment expenditures of firms that initially planned to internally-finance all their investment projects. Last, they argue that if shareholders disagree on an

[8] Masulis and Trueman's (1986) study assumes that 1) corporations pay the same effective marginal tax rate; 2) personal tax rates on dividend income differ across individuals; 3) capital gains taxes are effectively zero; 4) the IRS taxes regular corporate repurchases of equity in the same way as dividend payments; 5) there is an 80 percent dividend exclusion from taxes on all dividends paid by one corporation to another; and 6) there is no corporate debt.

internally financed investment policy, the firm will want more internally-generated funds relative to the firm's investment opportunities.

2.4. Dividend Clientele

As implied by Masulis and Trueman (1986), shareholders with different tax rates will not unanimously agree on the firm's investment and dividend decisions. The return to investors can be in the form of dividends or capital gains. On one hand, some investors prefer capital gains since they either do not have immediate use for the cash, they wish to avoid transaction costs and reinvesting the cash dividends is inconvenient, or they want to avoid paying higher taxes on dividends. In contrast, some investors prefer to receive cash regularly. For example, retired people may need additional cash to finance their daily needs. Therefore, these investors prefer stocks paying high and stable cash dividends to reduce transaction costs and the inconvenience and cost of routinely having to liquidate their stock holdings. In general, this group of investors has low income and lower personal tax rates, thus, they prefer dividends to capital gains (Frankfurter and Wood, 1997). This lack of unanimity between investors is believed to be resolved by investors choosing companies' stocks according to their investment preferences, separating them into dividend clienteles.

The dividend clientele effect was first suggested by Miller and Modigliani (1961, p.421),

> *"If for example the frequency distribution of corporate payout ratios happened to correspond exactly with the distribution of investor preferences for payout ratios, then the existence of these preferences would clearly lead ultimately to a situation where implications were different, in no fundamental respect, from the perfect market case. Each corporation would tend to attract to itself a 'clientele' consisting of those preferring its particular payout ratio, but one clientele would be as good as another in terms of the valuation it would imply for firms."*

Researchers mainly have two explanations for the observed dividend clientele: a tax-induced dividend clientele and a non-tax dividend clientele. Each is discussed in the following sub-sections.

2.4.1 Tax-Induced Dividend Clientele

The market value per share is equal to the cash flows expected to be received by the stockholder. In other words, the market value is determined by the discounted, expected, after-tax cash flows. Therefore, any differential tax treatment of capital gains relative to dividends might influence the investors' after-tax real return, and consequently affect their investment decision.

Under the "classical tax system" the tax treatments of capital gains and dividends are different. The effective tax rate on dividends is higher than the effective tax rate on capital gains for individual investors in many countries. In addition, capital gains are not taxed until they are realised, i.e., when the stock is sold. Therefore, investors can control the timing and the amount of capital gain tax payment by choosing when to invest and what stock and how many shares to trade. Investors can defer the unrealised capital gains in order to minimise their tax liability.

It is important to study the behaviour of the stock price on the ex-dividend day because a direct comparison can be made between the market valuations of dividends relative to realized capital gains. The reduction in stock price that occurs when stocks go ex-dividend provides an opportunity to examine the effects of personal taxation and dividend clienteles on share value.

In each dividend period there is an announcement day (the day that the company's board of directors releases information on the amount of the dividend) and the ex-dividend day that determines which shareholders will receive the payment (about two weeks after the announcement day and two weeks before the payment day). If the stock is purchased before the ex-dividend

day, the purchaser will receive the declared dividend. If the stock is purchased after the ex-dividend day, the dividend will belong to the stock's seller. The payment day is the day that dividend is actually paid out.

If investors purchase the stock after the ex-dividend day, then they will not receive the declared dividend. Therefore, the stock price offered should be lower than the price before the ex-dividend day. If dividends are not taxed and capital markets are perfect, paying a $1 dividend should lead to a $1 reduction in stock price. However, several studies have confirmed that, on average, stock prices fall by less than the amount of dividend. Early studies by Campbell and Breanek (1955) and Durand and May (1960) on the ex-dividend day behaviour documented that share prices drop by less than the amount of dividend.

Elton and Gruber (1970) analyze the ex-dividend day behaviour of stocks. They assume that since investors are interested in after-tax returns, the after-tax income from dividend and capital gains should be the same. Therefore, they developed the following equation to estimate the implied marginal tax rate:

$$[E(P_a) - P_b](1 - t_g) = D(1 - t_d). \qquad (2.1)$$

$E(P_a)$ is the expected stock price after going ex-dividend, P_b is the stock price before being ex-dividend, t_g is the capital gain tax rate, D is the dividend, and t_d is the ordinary income tax rate applied to dividend income.

The left side of equation 2.1 $[E(P_{a)} - P_b]$ is the capital gain times $(1 - t_g)$, which equals the net capital gain to the investor. The right hand side of equation 2.1 is the after-tax net dividend income. The left hand side must be equal to the right hand side in an arbitrage[9] free world.

[9] Arbitrage is a trading strategy designed to generate a guaranteed profit from a transaction that requires no capital commitment or risk bearing on the part of the trader. A simple example of an arbitrage trade would be the simultaneous purchase and sale of the same security in different markets at different prices.

Elton and Gruber use the stock price drop on the ex-dividend day relative to the dividend to estimate investors' marginal tax rates (IMTR). They use the estimated marginal tax rates to measure the tax-induced dividend clientele effects. Equation 2.2 represents the drop off ratio in the stock price on the ex-dividend day and it provides an estimate of the IMTR.

$$E\,(P_a - P_b) / D = (1 - t_d) / (1 - t_g). \qquad (2.2)$$

Elton and Gruber use 4148 observations between April 1, 1966 and March 31, 1967 determine that the average price decline as a percentage of dividends paid equals 77.7 percent. Elton and Gruber interpret their finding as showing that dividends are priced at a 22 percent disadvantage relative to capital gains. Their results imply that the marginal tax bracket of the average investor is 36.4 percent. They argue (pp. 68-74) that " the lower a firm's dividend yield, the smaller the percentage of its total return that a stockholder expects to receive in the form of dividends and the larger the percentage the investors expect to receive in the form of capital gains. Therefore, investors who held stocks which have high dividend yields should be in low tax brackets relative to stockholders who hold stocks with low dividend yields." Elton and Gruber conclude that their evidence is consistent with personal taxes affecting stock prices via dividend payout and suggests that Miller and Modigliani (1961) were right in hypothesizing a clientele effect.

Elton and Gruber's (1970) findings are strengthened by Barclay's (1987) evidence that the ratio of price decline to dividend payment was 1.0 (or 100 percent) in the early 1900s, before adoption of personal income taxes in 1913, but not after that date. However, Brooks and Edwards (1980) point out that Elton and Gruber's use of a market equilibrating process to estimate a personal marginal tax rate is not accurate unless long-term capital gain sellers are included in the sample because short-term capital gains are taxed as ordinary income. Thus, reliable estimation of marginal tax rates might be better obtained

by sampling and direct examination of stockholder's tax returns along with their stock purchase and sales activity.

Kalay (1982) provides a counter argument to the Elton and Gruber (1970) interpretation. He indicates that arbitrage may be carried out by a trader who does not own the stock initially. They would not receive favoured capital gains treatment, but would have to pay ordinary income taxes on short-term gains. The arbitrage profit π is:

$$\pi = - P_b + D - t_d D + P_a + t_d (P_b - P_a). \quad (2.3)$$

Traders would spend (P_b) to acquire the stock before it goes ex-dividend, then receive the dividend and pay ordinary income taxes on it, and finally sell the stock after it goes ex-dividend receiving (P_a) and receive a tax shield from their short-term loss. Their profit is:

$$\pi = (1 - t_d) (P_a - P_b + D). \quad (2.4)$$

To prevent arbitrage profits, the price decline must equal the amount of the dividend payment or:

$$P_a - P_b = D. \quad (2.5)$$

Kalay's (1982) findings suggest that in the absence of transactions costs, arbitrage should push the ratio to 1.0. Kalay argues that the transactions costs are too large for individual investors to be the marginal price-setters but instead, zero-tax-rate institutions might fulfil that role on the ex-dividend day. He suggests that inferring tax rates from ex-dividend day returns is complicated by transactions costs and the effect of institutional traders; however, he does not explain why the mean ratio differs from 1.0.

Eades, Hess, and Kim (1984) examine the ex-dividend day returns for a non-convertible preferred stock sample. They report that the ex-dividend day share price drops to 85 percent of the dividend per share. Their results are consistent with tax-induced clienteles. If the marginal purchasers are corporations, corporations are able to exclude 85 percent of any dividends received as taxable income, whereas capital gains are taxable at rates as high as 46 percent if they are short-term capital gains.

Litzenberger and Ramaswamy (1980) present evidence that is consistent with a tax-induced clientele effect. They divide their stocks into five sub-samples based on expected dividend yields. Group I contains the lowest yield stocks and group V the highest yield stocks. They assume that a larger dividend yield coefficient implies higher investors' marginal tax rates. Litzenberger and Ramaswamy find a smaller dividend yield coefficient for the higher dividend yield groups, which is consistent with their hypothesis that a larger dividend yield coefficient implies higher investors' marginal tax rates. They interpret this result as evidence of a tax-induced clientele effect.

Michaely (1991) provides conflicting evidence by investigating the ex-dividend day behaviour of share prices before and after the passage of the 1986 Tax Reform Act in the US. He finds no evidence of excess returns around the ex-dividend day before and after tax reform. The evidence indicates that during the latter part of the 1980s the ex-dividend day price drop is equal to the dividend per share. The change occurred before tax reform in 1986, therefore, providing no evidence of tax effects. Eades, Hess, and Kim (1994) find substantial time-series variation in the ex-dividend day behaviour of share prices. This variation does not correspond to changes in the tax code, again providing no evidence of tax effects.

Blume, Crockett, and Friend (1974), and Chaplinsky and Seyhun (1990) provide weak evidence that investors hold shares in a way that dividend yield and personal taxes are negatively correlated. However, Lewellen, Stanley, Lease,

and Schlarbaum (1978) find no such evidence. Sholz (1992) uses a sophisticated measure of the tax preference of dividends over capital gains and controls for household wealth and indirectly controls for risk. Sholz finds a negative relationship between the dividend yield on an investor's stock holdings and the relative taxation of dividends. Strickland (1996) finds that mutual funds and money managers hold low-dividend yield portfolios of stock, while untaxed institutions such as pension funds show no such preference.

Fama and French (1998) regress the changes in firm value on the changes in dividends in order to determine whether dividends and taxes affect firm value. If personal taxes are negatively priced into dividend value, the dividend variable is expected to have a negative coefficient. Fama and French find a positive coefficient, which probably occurs because either their proxy for firm value is measured with error or non-tax effects overwhelm the tax-effect of dividends. For example, if firms use dividends to signal quality, dividend payments might be positively correlated with firm value. This is the only study that directly regress firm value on dividend variables in an attempt to determine the tax effect of dividends.

To conclude, the empirical evidence around the ex-dividend day is inconclusive. Earlier results are consistent with the tax clientele hypothesis, while other studies suggest that factors other than tax should contribute to at least part of the ex-dividend day share price behaviour.

2.4.2 Non–Tax Induced Dividend Clienteles

While the main focus of this research is to examine the tax induced dividend, financial leverage and the joint clientele hypotheses, two non-tax induced dividend clienteles have recently emerged as explanations for the behavior of share prices on the ex-dividend day.

2.4.2.1 Transaction Costs and Short –Term Trading

The tax effects explanation of ex-dividend day stock price behavior has been challenged on the basis of transaction costs and short-term traders' behavior. Kalay (1984), Miller and Scholes (1978), and Lakonishok and Vermaelen (1986) argue that a drop off ratio of less than one provides profitable ex-dividend day arbitrage opportunities for short-term traders. The process of eliminating arbitrage profits by short-term traders will cause the observed drop off ratios to divert from one by bounds imposed by the marginal trader's round trip transaction costs. They argue that unless their bounds are large (transaction costs are high enough to prevent arbitrage) the drop off ratio is likely to reflect transaction costs rather than any dividend tax related premium.

Advocates of the tax effects argument, Elton, Gruber and Rentzler (1984) argue that the drop off ratios are likely to fall within the non arbitrage profit boundaries and will, therefore be determined by tax considerations rather than transaction costs. In addition, most of the empirical evidence on the magnitude of transaction costs and short-term trading activities is either inconclusive (Lakonishok and Vermaelen, 1986, Booth and Johnson, 1984), or it indicates that transaction costs and short-term trader activities have little effect on the drop off ratio. For example, Karpoff and Walkling (1988) indicate that short-term trading has virtually no effect on the ex-dividend day price behavior. Poterba and Summers (1984) suggest that short-term traders have little impact in determining ex-dividend day share price behavior. Kaplanis (1988) reports results consistent with the tax effect explanations.

This study will rely on these findings and assume that the effect of transaction costs and short-term traders are negligible in affecting the drop off ratio. However, the magnitude of transaction costs and short-term trading activities in the New Zealand setting is an empirical question beyond the scope of this research.

2.4.2.2 Ex-Dividend Day Risk and Investors' Heterogeneity

Another challenge to the Elton and Gruber drop off ratio as an estimate of the marginal investors' IMTR arises from the ex-dividend risk exposure and heterogeneity of investors' tax rates. Both effects may cause the drop off ratio to be different from one.

Kalay (1984) and Heath and Jarrow (1988) argue that ex-dividend day risk exposure arises from the need to compensate investors for taking undiversifiable positions in a stock over the cum-dividend /ex-dividend period and incurring the risk of an uncertain price decline compared with the receipt of a certain dividend. Fedenia and Grammatikos (1993) find evidence consistent with a risk premium influencing share prices on the ex-dividend day. Michaely and Vila (1995, 1996) indicate that total risk interacts with transaction costs to reduce trading around the ex-dividend day. They also indicate that investors' tax heterogeneity causes trading volume to increase. This is especially true for high dividend yield securities where corporate and institutional traders dominate a situation, which may cause the drop off ratio to differ from one (Hietala and Keloharju, 1995, Liljelom, Loflund and Heduall, 2001). McDonald (2001) reports a significant difference in the drop off ratios between domestic stocks, which may not be owned by foreign investors, and unrestricted stock.

These results suggest that the drop off ratio may be influenced by the tax status of different investor groups. To incorporate these possibilities into the analysis this project examines the relationship between the percentage of financial institutional holdings, a proxy for the degree of foreign ownership, and the IMTR. Lack of a significant relationship between the percentage of institutional holdings and the percentage of foreign ownership and the IMTR suggests that the result of this study is not influenced by investors' heterogeneity.

In addition, the study incorporates the percentage of financial institutional holdings, the degree of foreign ownership, and a measure of total risk as proxies for investors' heterogeneity and risk in the cross sectional regression analysis.

2.4.2.3 Discreteness

The question of why stock prices drop by less than the dividend amount on the ex-dividend day remains a puzzle. Bali and Hite (1998) use discreteness to explain the phenomenon. In the US prior to year 2001, share prices were reported on the basis of one eighth of a dollar which is 12.5 cents. In contrast, dividends are measured and reported in cents. Bali and Hite believe that the reason why stock prices drop by less than the dividend amount is due to the different reporting bases (discreteness). They find discreteness declines in importance as dividend size increases and the price decline is proportionally closer to the full dividend amount.

Bali and Hite argue that on the ex-dividend day, the market might round the stock price change up to the tick just above the dividend, or down to the tick just below the dividend or, perhaps, to the nearest tick. They believe that the market will round down because no buyer will pay a price greater than the dividend. Therefore, the stock price would drop less than the amount of the dividend. Because dividends are typically small, discreteness will play an important role in explaining observed ex-dividend day stock price changes.

For New Zealand listed companies prices are allowed to be quoted to the nearest one tenth of a cent. While the majority of the prices of listed companies are quoted to the nearest cent, dividends are also paid to the nearest cent for the majority of listed companies. Thus, the discreteness effect may not be ruled out as an explanation to the ex-dividend day stock prices behaviour, but it should have a minimal effect on the results of this study, which is one of the unique aspects of using New Zealand data.

2.4.2.4 Market-Microstructure

Frank and Jagannathan (1998) examine a test on data from the Hong Kong Stock Exchange for the period of 1980-1993 and find an average dividend of HK$0.119 and an average stock price drop of HK$0.065. Hong Kong does not tax capital gains or dividends, and yet they find results that are consistent with environments where capital gains and dividends are taxed. This suggests that tax-induced dividend clientele effects are not the only potential explanation for the failure of ex-dividend day prices to adjust fully to dividends paid. Frank and Jagannathan (1998) use a market microstructure explanation to reconcile their findings. They argue that dividends are a nuisance and that market makers can better handle the collection and reinvestment of dividends. Therefore, investors unload the stock cum dividend to market makers, who are compensated for handling the dividend by the dividend itself. This is especially true for low-dividend stocks, for which the transaction cost remains the same, but for which the reward for handling the dividend is smaller. The implication is that prices should fall by less than the dividend amount due to supply and demand on the ex-dividend day.

Kadapakkam (2000) strengthens Frank and Jagannathan's argument by showing when the cost of handling dividends (i.e., cumbersome physical settlement procedures) was reduced after the advent of electronic settlement, the ratio of price change to dividend on the Hong Kong Stock Exchange becomes indistinguishable from 1.0. The Frank and Jagannathan (1998) and Kadapakkam (2000) studies imply that market microstructure explain the ex-dividend day stock price behaviour.

While the issue of microstructure represents one of the explanations to the ex-dividend day behaviour, it does not rule out other explanations. It is therefore an empirical question to determine whether the ex-dividend day stock price behaviour under the New Zealand setting is consistent with this or other explanations.

2.5. Financial Leverage Clientele

A financial leverage clientele was first suggested by Farrar and Selwyn (1967), as an attempt to reconcile the Modigliani and Miller (1963) maximum leverage prediction with observed capital structures. Their explanation suggests that firms do not pursue maximum leverage policies because of differential tax treatments of personal income from stocks and bonds and the manner in which it interacts with the (personal and corporate) taxable interest payments' deductibility. According to this view there are some investors for whom the favourable tax treatment of stock returns relative to that of returns from corporate bonds at the personal level more than offsets the favourable tax treatment of interest payments at the corporate level. These investors would prefer to hold shares that follow less-than-maximum-leverage policies.

Miller (1977) advances the previous argument and shows that, under the US tax structure, differential personal taxes on the income from stocks and bonds acts as a counterweight to the corporate benefit of tax-deductible interest payments. He argues that the tax incentive from corporate leverage will disappear altogether for the individual firm, even though there still exists a macroeconomic demand for, and supply of, corporate debt. One important implication that follows directly from Miller's analysis is that low-leverage firms would find a natural clientele for their securities among investors in high tax brackets. Miller (1977, p.269) comments on the possibility of financial leverage clienteles:

> *"Companies following a no-leverage or low-leverage strategy (like IBM or Kodak) would find a market among investors in the high tax brackets; those opting for a high leverage strategy (like electric utilities) would find the natural clientele for their securities at the other end of the scale."*

Chang and Rhee (1990) develop a leverage clientele hypothesis, which states that investors in low tax brackets earn government tax subsidies on corporate

debt financing by holding levered firms' common stocks. Investors in high tax brackets, on the other hand, would rather lever themselves on personal accounts because the marginal personal interest tax shield is greater than the marginal corporate interest tax shield. Chang and Rhee further argue that the gains from leverage are greater when all earnings are paid out as dividends than when all earnings are retained. Thus, firms with high payout ratios will borrow more than firms with low dividend payout ratios. This constitutes a testable hypothesis; firms with high payout ratios tend to be debt financed, while firms with low payout ratios tend to be equity financed.

Harris, Roenfeldt and Cooley (1983) use survey data from a brokerage firm to conduct their investigation of financial leverage clienteles. Their evidence indicates that personal tax rates tend to be highly negatively correlated with financial leverage. They conclude that low levered firms would find a natural clientele for their securities among investors in high tax brackets, while highly levered firms would be preferred by investors in low tax brackets. Harris, Roenfeldt and Cooley (1983) point out those individuals with low incomes overstate their earnings on surveys, while individuals with high incomes understate their earnings. Their study uses market data that could eliminate the potential biases in measuring tax rates that result from using a questionnaire directed to clients of a single brokerage firm by using estimates of the IMTR.

Although Farrar and Selwyn (1967), and Brennan (1970) argue that firms should not pay dividends at all due to tax disadvantages, Bhattacharya (1979) argues that the signalling value of dividends is positive and can be traded off against the tax loss associated with dividend income. An unexpected dividend increase is taken as a favourable signal by investors. Dividend policy conveys information about the value of the firm that no other means does. In addition, investors may believe that the signal that dividend policy sends is real because it would be expensive for less successful firms to forge the positive signal as they have to pay an extra cost to externally finance the cash dividends.

Bhattacharya's argument explains why firms pay dividends despite the tax disadvantage.

This chapter provides an overview of the different theories, which have been developed with regard to dividend policy in general and to the ex-dividend day behaviour of share prices in particular. In addition, the chapter provides a review of both the dividend and financial leverage clientele literature. The review indicates that the questions of why companies pay dividends and why share prices drop by less than the amount of dividend on the ex-dividend day remain unresolved issues at both the theoretical and empirical levels. The next chapter provides a detailed discussion of the dividend imputation tax system and its uniqueness under the New Zealand tax regime. It highlights the implications of its features with regard to the hypotheses of this thesis.

CHAPTER 3

DIVIDEND IMPUTATION SYSTEM UNDER THE NEW ZEALAND TAX REGIME

The main objective of this chapter is to discuss the uniqueness of the New Zealand dividend imputation tax system with respect to tax differentials between dividends and capital gains, and the introduction of the Foreign Investors' Tax Credits (FITC). In addition, the aim is to tie these features into the testable hypotheses to be developed in Chapter 4. A final objective is to provide a more detailed discussion about the difference between the classical and dividend imputation systems and to highlight the arguments in favour of, and against, the dividend imputation system before it came into existence.

New Zealand changed from a classical system of corporate taxation to a dividend imputation system in April 1988. Unlike most (partial) imputation systems, as in Australia, the United Kingdom (UK) and Canada, New Zealand adopted a full imputation system. The primary objective of the reform was to eliminate double taxation on corporate income (Nelson, 1987). Under the imputation system, when a company pays tax on at least some of its profits and distributes any of these profits as dividends, its shareholders receive a credit for tax paid by the company where the tax credits are attached to the dividends (Nelson, 1987). Thus, taxable income of the firm is taxed at the marginal tax rates of their shareholders. In the case of dividends, the dividend distribution is grossed up by the amount of corporate tax paid on the income upon which the dividends are paid. Then, shareholders are taxed on the total amount, and given a tax credit for the amount of corporate tax paid. If the individual's marginal tax rate is lower than the corporate tax rate, the shareholder may use the tax credit against other tax liabilities (Richards and Doherty, 1987). In essence, the imputation system means that some of the corporate tax collected at the firm

level *"is not really corporate tax but rather is a collection of personal tax at the firm level"*, Officer (1994, p.4).

3.1 Uniqueness of New Zealand Tax Imputation System Relative to the Classical Tax System

3.1.1 Differentials between Capital Gains and Ordinary Income

Net income after taxes can be distributed as cash dividends or retained for future investments. Shareholders require a rate of return on retained earnings equivalent to the rate of return that they could earn from other investment opportunities with similar risk. On the other hand, if the firm decides to distribute net income as dividends, then the dividend income will be included in the individual shareholder's ordinary income, and subject to personal income tax. Under the New Zealand full imputation tax system, when the firm pays corporate tax on its profits then distributes any of these profits as dividends, its shareholders receive a credit for taxes paid by the firm. Prior to 1 April 2001, both the corporate tax rate and the top personal tax rate were 33 percent. Thus, if shareholders receive dividends with a tax credit equivalent to 33 percent, then there is no additional tax payable on the dividend income.

In New Zealand there is no capital gains tax. If the firm reinvests the net income and generates a capital gain equivalent to the dividend payment to the shareholders, shareholders receive the capital gain without paying any tax either. Therefore, there would be no tax differential between capital gains and dividends for shareholders in New Zealand. In other words, from a tax view point, shareholders should be indifferent in terms of receiving their income in the form of capital gains or dividends.

Since there is no tax differential between capital gains and dividend income for shareholders in New Zealand, the tax effect explanation for dividend clienteles

should be eliminated if the ex-dividend day price drop is not found to equal the dividend payment.

3.1.2 The Classical Tax System and the Dividend Imputation Tax System

To better understand the difference between the classical and imputation tax systems, consider the following example. Assume that firm A has earnings before corporate tax of $100, the corporate tax rate is 33 percent, and the shareholder's marginal tax rate is 33 percent. Also assume that no earnings are retained and that all net income is distributed as cash dividends under both the classical and dividend imputation tax systems.

Table 3.1:

Comparison between the Classical and the Dividend Imputation System

Comparison of net dividend income between the classical tax system and the New Zealand full imputation tax system

Description	Classical	Imputation
Firm A Earnings before Taxes	$100	$100
Less Corporate taxes (33%)	33	33
Net Profit Available for Dividend Distribution	67	67
Dividend Distributed	67	67
Dividend Imputation Tax Credit	0	33
Total Taxable Dividends	67	100
Personal tax Payable	22	33
Net Dividend Income	**45**	**67**

Source: Generated by author.

From the above example, under both the classical and the dividend imputation tax systems, the funds available for dividend distribution are the same, i.e., $67. Under the classical tax system, the dividends will be taxed again at 33 percent, i.e., $22, resulting net dividend income for the shareholders of $45. Under the dividend imputation tax system, the distributed dividends have the 33 percent tax credits attached; therefore, the total taxable dividend is $100. After paying the 33 percent personal income tax, the net dividend income is $67, which is 33

percent more than the net dividend income under the classical tax system. The difference is the imputation tax credit at the 33 percent corporate tax rate.

Under the classical tax system the shareholders are effectively taxed twice, first, at the firm level, and then at the shareholders' marginal tax rates. With the dividend imputation tax system the shareholders are taxed at the company tax rate, which is offset by the tax credit shareholders receive to counter their personal taxes. Under this tax system the shareholders are effectively taxed only once.

3.1.3 Foreign Investors

Benge and Robinson (1986) indicate that the introduction of the New Zealand imputation tax system in 1988 helped to alleviate the problems associated with the classical taxation system and its double taxation of the firm's income. But, the system was designed to reduce the double taxation of corporate income for resident shareholders. Non-resident shareholders or foreign investors were treated differently and were unable to participate in the imputation credit or to make use of the imputation system. In other words, non-resident shareholders remained under a classical tax regime, subject to withholding taxes[10]. The implication is that this creates differential tax liability.

Several studies point out and discuss the problems associated with the imputation tax regime where foreign shareholders are penalized relative to domestic shareholders. Head (1993), Winsen (1992) and Smith (1994, 1995) argue that denying imputation advantages to non-resident investors discourages foreign investment. As a result, several other researchers have noted the pressures applied to imputation countries to extend the benefits to non-resident and foreign investors (Vann, 1986; Bird, 1987; Harris, 1994; Smith, 1994).

[10] Non-resident withholding tax is 15%.

Nonetheless, because foreign shareholders do not benefit from the imputation system as compared to resident shareholders, clienteles based on country of domicile could result.

New Zealand amended its tax policy by introducing the FITC system to non-resident portfolio investors, defined as those with less than 10 percent interest (in terms of voting power or market value) in a New Zealand resident company on 5 August 1993. However, the FITC is limited to portfolio investors only, and excludes direct foreign investors who have more than a 10 percent interest in a New Zealand resident company. Under this FITC regime, direct foreign investors are still subject to higher taxation as before when they receive dividend payments, since there is no supplementary dividend available for them. Thus, direct foreign investors prefer debt investment to equity investment. "An existing double tax on equity investment by non-residents ... had encouraged high levels of foreign debt investment. Elimination of that double tax should cause companies to focus on their balance sheet structures in a way that will result in equity replacing debt"[11]. As a result, the New Zealand government extended the FITC regime to all foreign investors on 12 December 1995. Thus, the FITC regime for foreign investors allowed some limited access to the imputation system, Smith (1994)[12].

Shewan and Heffernan (1993), Smith (1994) and Inland Revenue (1986) explain how the FITC works. Essentially, the process operates by way of a supplementary dividend system, which enables a company to pay an extra dividend to foreign investors. This dividend equates to the level of withholding tax applicable to the total dividend. The company then receives a rebate for the supplementary payment. The foreign investors are generally entitled to a credit for the dividend withholding tax paid to the New Zealand Government (which

[11] J. Shewan, Coopers and Lybrand tax partner, *Dominion*, 14 July, 1995, p.10.
[12] Inland Revenue (1986) believes that: "A portion of the underlying company tax is effectively refunded to non-residents, resulting in the total New Zealand tax (combining company tax and NRWT) on company income being limited to 33 percent", p.23.

has in effect been refunded by way of the supplementary dividend) against tax payable in the investors' home country. No such tax credit would generally have been available for the company tax paid[13].

Smith (1994 p.259) notes that the regime was "*designed to ensure that the tax relief provided in New Zealand will not be clawed back by foreign governments in the non-resident and foreign investors' home countries under the foreign tax credit provisions*". The FITC regime has partly enabled foreign investors to access the dividend imputation system.

Liljeblom, Loflund, and Hedvall (2001) suggest that the introduction of the FITC may cause the percentage of foreign investors relative to domestic investors to increase as well as the valuation and the demand for dividend. Since foreign investors may be in higher tax brackets they tend to invest in companies that pay high dividends.

To illustrate the mechanics of the FITC system consider Table 3.2. Assume that firm B has earnings before corporate tax of $100, the corporate tax rate is 33 percent, and the shareholder's marginal tax rate is 33 percent. It is also assumed that there are no retained earnings.

[13] Shewan and Heffernan (1993) point out that "if New Zealand had simply repealed the NRWT, then there would be no credit available in the foreign jurisdiction and the non-resident and foreign investors' foreign tax liability would increase by the same amount as his/her New Zealand tax liability reduced", p.280.

Table 3.2

Tax Computation for Resident versus Foreign Investors

Comparison of the net after tax dividend paid to the shareholders for resident and foreign investors for the period before and after the introduction of the FITC in 1995.

Description	Residents	Non-Resident or Foreign Investors	
		Before 1993	After 1995
Company Gross Profit	$100	$100	$100
Less Corporate Tax (33%)	33	33	33
Net Profit Available for Dividends	67	67	67
Taxable Dividends for Shareholders	100	67	79
Tax payable by Shareholders	33	0	0
Non-Resident Withholding tax	0	10	12
Less Imputation Tax Credit	33	0	0
Less FITC (Supplementary Dividend)	0	0	12
Net Shareholders tax	0	43	33
Net after Tax Paid Dividend	**67**	**57**	**67**

Source: Generated by author.

Under the New Zealand dividend imputation system, before the adoption of the FITC, foreign investors were clearly disadvantaged as their net dividend (in the example above) was $12 less than a New Zealand resident. Compared to residents, they did not benefit from the dividend imputation system. After the adoption of the FITC, the non-resident and foreign investors are entitled to a credit for the dividend withholding tax paid to the New Zealand government (which has in effect been refunded by way of the supplementary dividend) against the taxes payable in their own country. Therefore, the FITC regime has enabled non-resident and foreign investors to access the imputation system.

The introduction of FITC allows a comparison of the period before and after its introduction to examine the effect of tax changes in regard to dividend clienteles. In addition, FITC provides the opportunity to examine the possibility of the existence of foreign and non-resident clientele.

3.2 Historical Background of the New Zealand Dividend Imputation System

This section discusses the arguments in favour and against the imputation tax system[14] when the government of New Zealand debated and later adopted the imputation system.

3.2.1 Arguments for Dividend Imputation Systems

The main argument for the dividend imputation system is to eliminate the classical system's double taxation of income. Firms pay corporate tax on their profits and shareholders are taxed again at the personal level when they receive the after tax corporate profits as dividends. Nelson (1987) points out that the government of New Zealand realized that it is "unfair to the shareholders, especially to those on lower incomes", to be taxed twice.

Under the classical system, if the firm finances its projects by equity, the cost of equity is taxed at both the corporate and personal levels. Thus, the classical system encourages debt financing, since the cost of debt (interest expense) is tax deductible. The government of New Zealand believed that the high debt to equity ratio facilitated a large number of corporate take-overs and failures, and it was considered that the dividend imputation system would reduce the problem.

Further, under the classical tax system, firms increase shareholder tax liability when dividends are distributed. Thus the classical system had a bias toward retained earnings rather than dividend distributions. If a firm distributes

[14] New Zealand Ministry of Finance first explored the possibility of introducing dividend imputation in a statement on Taxation and Benefit Reform on 20 August 1985. In the Budget Speech of July 1987, the government confirmed that it would proceed with a full dividend imputation system to replace the classical tax system. The imputation system became law with the passing of the Income Tax Amendment Act No. 5 (1988). The act had retrospective effect back to 1 April 1988.

dividends, it is more likely to externally finance current business operations and profitable projects. However, double taxation discourages firms from distributing dividends, and, firms are less likely to acquire external financing (debt). When firms require external financing, bankers and other financial institutions thoroughly examine the financial status before granting the financing. After the banks and financial institutions facilitate the external financing, it is also in their interest to monitor the firms' performance to protect their investment. Therefore, banks and financial institutions provide a monitoring function for the shareholders of firms, which reduce the agency costs. But under the classical system less of this activity will take place, which will weaken corporate governance (Nelson, 1987). The dividend imputation system solves this problem.

In addition, other forms of businesses including partnership and sole traders do not pay tax at the business level. The net profits of these businesses are only taxed at the personal level. But companies are taxed at both company and individual levels. The government of New Zealand believes that the tax situation that exists is not neutral between companies and other types of business structure, such as partnerships and sole traders (Nelson, 1987). This is another reason why the government was in favour of the dividend imputation system.

3.2.2 Arguments against Dividend Imputation Systems

The argument against imputation tax system states that double taxation of income seldom occurs, and "is avoidable for most companies. Small companies pay out salaries, and many large companies, eight out of top twenty companies in 1986, paid no tax at all, as well as distributing tax-free benefits to shareholders" (Nelson, 1987). Since most companies do not pay corporate taxes, dividends are only taxed at the personal level, thus there is little double taxation even under the classical system.

Experience from overseas countries indicates the dividend imputation system will not increase firms' equity financing (Nelson, 1987). Interest expense, which is the cost of debt financing, is tax deductible, while dividends are paid from the firm's after tax net income. This behaviour is not changed under the dividend imputation system. Therefore, firms will not change their capital structure due to the dividend imputation system so a dividend imputation system will not encourage management to increase a firms' equity base.

The government of New Zealand also believes that the classical system encourages a large number of take-overs, and introducing a dividend imputation system will limit the number of take-overs (Nelson, 1987). However, there are more effective measures to limit the number of take-overs. For example, when a firm borrows money to finance a take-over, the government could limit the interest deduction, making the take-over more difficult or at least more expensive for the bidder (Nelson, 1987).

The strongest argument against the classical tax system is the double taxation of income. The government of New Zealand believes that double taxation unfairly disadvantages shareholders, those with low income in particular (Nelson, 1987). However, low-income earners are less likely to have the spare income to invest or access to finance any investment in the share market. They are more likely to suffer from government spending cuts and higher indirect taxes relative to double taxation. In other words, the shareholders, who benefit from the dividend imputation tax system, are most likely higher income earners. Lower income earners are less likely to directly benefit from the dividend imputation system.

Unlike partnership and sole traders, companies and the shareholders are often separate legal entities; therefore many experts argue they should be taxed separately. However, under the dividend imputation tax system, firms actually pay taxes at an individual shareholder's personal tax level. This contradicts the idea that separate entities should be taxed separately.

3.3 Empirical Studies of Imputation Tax Systems

Ex-dividend day price falls of less than the amount of the dividend have been widely documented in several of studies. Most of the empirical literature in the area is focused on tax developments in the USA, where the classical system continues to operate. There have been comparatively few empirical studies undertaken on the impact of dividend imputation systems.

3.3.1 Non-Australasian Studies

Kalay (1982) and Lamdin and Hiemstra (1993) using US data, provide confirmation that share prices drop by less than the amount of dividend on the ex-dividend day. In Canada, Lakonishok and Vermaelen (1983) and Booth and Johnson (1984) report mean drop off ratios significantly less than one. Lasfer (1996) using UK data; Michaely and Murgia (1995) using Italian data; Hietala (1990) using Finnish data and Espitia and Ruitz (1997) using Spanish data provide the similar findings that the ex-dividend day price falls by less than the amount of the dividend.

Poterba and Summers (1984) present a detailed study on how the UK's dividend imputation system influences firms' dividend policies. They study the impact of changes of tax treatment of dividends in UK in relation to stock prices for a period of over thirty years. Of particular importance was the change from the classical tax system to the imputation system in 1973. As such, the study not only provides evidence of tax induced dividend clienteles under an imputation system, but also uses the "natural experiment" which has been carried out in the UK as evidence of how share prices react (if at all) to a relaxation of taxes on dividends.

Poterba and Summers argue that if taxation of dividends does influence share prices, it should be possible to observe such changes on the day that a revision in the taxation of dividends was announced. They find there was a change in

the yield effect following the introduction of the imputation system. This provides support for the traditional view that dividends under a classical system adversely affect share prices (i.e., there is a relationship between dividend yields and stock market returns). Poterba and Summers use the arbitrage arguments of Miller and Scholes to argue that the clientele effect would not significantly influence their conclusion that taxes on dividends do influence share prices under a classical system. They summarise;

> *"Clienteles might attenuate the burden of dividend taxes, but would not eliminate it, unless taxpaying investors held only zero dividend stocks. The data clearly reject this possibility"* Poterba and Summers (1984, p23).

Crossland, Dempsey and Moizer (1991) present a paper with strong support for the clientele effect under an imputation system. They argue that the price behaviour of a share at the time of its going ex-dividend presents evidence of shareholder rationality. If shareholders 'rationally' capitalise their dividends received on an after tax basis, the change in the price of a share when it goes ex-dividend should be a well defined function of shareholders' assessment of their own personal tax brackets. In turn this would substantiate the clientele effect hypothesis. Their conclusions are aligned with the Elton and Gruber (1970) study when they conclude, "*the clientele effect prevails amongst UK investors*" (Crossland, Dempsey and Moizer, 1991, p.39).

The conclusions of the Crossland, Dempsey and Moizer (1991) study are in contrast to an earlier study by Davidson and Mallin (1989) that drew upon the same database. They identify some of the empirical problems that were endemic to the Elton and Gruber (1970) study. They repeat the Elton and Gruber study to confirm that their apparent clientele effect is present in the data. Three samples are used: an interim dividend sample, a final dividend sample, and an interim-final dividend sample. Two empirical aspects of the Elton and Gruber tax-induced clientele hypothesis are examined. The first is the extent to which estimates of the central location of the 'ex-dividend' statistic is affected

by various methods of estimation. The second is the degree to which the widely reported 'dividend yield' effect is a robust feature of the data. Their findings suggest that the yield effect is much weaker than is generally believed, bringing into question the simple tax-induced clientele hypothesis.

3.3.2 Australasian Studies

Brown and Walter (1986) investigate ex-dividend day behaviour using Australian data under a classical tax regime over the period of 1974 – 1984. They find a mean drop off ratio of 75 percent; implying dividends were discounted relative to capital gains by 25 percent. However, the complexity of the Australian tax system, the wide range of investors' tax statuses, and the uncertain influence of transaction costs made it difficult to interpret the result as being solely due to tax effects. Brown and Walter (1986) point out that first; it is difficult to differentiate the effect of tax-based clienteles from the effect of short-term traders inhibited by transactions costs and risk. Second, previous literature reveals considerable variation in drop-off ratios cross-sectionally, and also in time series (Eades, Hess and Kim, 1994). It is unclear that how much of this variation is systematic and how much is noise. In addition, there is the problem associated with adequately controlling factors other than dividends, which change prices in the period between observation of the cum-dividend price and the ex-dividend price.

Australia adopted a real realized capital gains tax system in 1985 and a dividend imputation tax system in 1987. The purpose of the dividend imputation system is to increase the value of dividends relative to capital gains for Australian resident shareholders. Brown and Clarke (1993) analyze conventional drop off ratios and drop off ratios grossed up for imputation credits. They develop a theoretical model of ex-dividend day price behaviour under the Australian imputation tax system, and predict an increase in the drop-off ratio. However, their empirical evidence shows that the drop-off ratio fell following the introduction of the imputation system. As time progressed, there is some

evidence of drop-off ratios increasing under the new tax regime. They calculate the average drop off ratio of 72 percent during the period before the dividend imputation tax system, and a maximum grossed up drop off ratio of 60 percent after the adoption of the dividend imputation tax system. Brown and Clarke's (1993) analysis is based on long-term investors. Their results suggest that dividend imputation tax credits are valued well below the face value by long-term investors.

Walker and Partington (1999) attempt to eliminate the confounding effects of risk, market movements, company related news, and market microstructure effects due to the share price difference between the cum-dividend and ex-dividend prices. In traditional ex-dividend research in Australia, cum-dividend and ex-dividend prices will be separated by at least eighteen hours or more, from the closing of the cum-dividend to the opening of the ex-dividend. For thinly traded shares, the time lag can be even longer. Thus, the time lag may create a potential problem for research that part of any individual share price change might contain a component reflecting the general share market movement. In order to eliminate such a problem, Walker and Partington (1999) utilize the uniqueness of the Australian Stock Exchange trading practices. At a stockbroker's request, trading is allowed in cum-dividend shares even though the official ex-dividend date has passed. This trading is possible because the book's closing date occurs seven business days after the ex-dividend date. Therefore, their sample eliminates the problem associated with the cum-dividend and ex-dividend share price difference, providing them a clean measurement of the price drop-off ratio.

Heath and Jarrow (1988) demonstrate that if the short-term trader is uncertain whether the price drop-off will be above or below the dividend, then the equilibrium drop-off ratio can differ from one.

Boyd and Jagannathan (1994) model the ex-dividend price drop-off with a price risk factor by adding a risk premium to the discount rate. Grammatikos (1989)

and Fedina and Grammatikos (1993) provide empirical support for the existence of the risk premium. The Australian Stock Exchange adopted an electronic share registration system to facilitate the rapid transfer of share ownership. The trades are nearly instantaneous, thus their analysis should largely be free of confounding effects including the risk premium.

Walker and Partington (1999) estimate the joint valuation of dividend and imputation tax credits and the implied market value of dividend imputation tax credits. Their study provides a mean drop off of 1.15, which suggests that the market values each dollar of fully imputed dividends at one dollar and fifteen cents. They report that the implication of this drop off ratio is that the imputation tax credits are valued at 88 percent of the face value.

Due to the uniqueness of their sample, the Walker and Partington (1999) study cannot be generalized to the whole market over different time periods. They find that most trades in their sample of 93 ex-dividend day events are in liquid, high capitalization shares, especially in high dividend yield banking shares. This study finds that the sellers of these shares are those who could not utilize the imputation tax credits such as tax exempt or foreign investors. These investors are willing to sell the shares as long as the prices are higher than the ex-dividend day share prices plus the dividend amount. Their study provides little evidence on the process driving market prices outside the limited cum-dividend and ex-dividend period.

There is no published study that addresses the impact of New Zealand dividend imputation on the market valuation of dividends and imputation tax credits. Bartholdy and Brown (2001) examine the pricing of dividends under the classical tax system. Their sample period covers between 1982 and 1985. During that period, companies were allowed to pay either taxable or non-taxable dividends. They find support for tax induced pricing behaviour driven by long-term investors, but the study provides little support for the short-term trading hypothesis. However, their research design assumes that the transaction cost is

zero. Partington and Walker (2001) extend the Bartholdy and Brown (1999) study by including transaction costs. Their results demonstrate support for tax induced pricing behaviour driven by short-term trading.

Chay and Marsden (1996) use an event study methodology to measure the stock market response to the announcement of Foreign Investors' Tax Credits (FITC) system in 1993. Under the FITC system, the dividend after payment of New Zealand income tax is the same for foreign and resident taxpayers. They find that positive abnormal returns were concentrated in companies with high effective tax rates which paid large amounts of dividends with fully imputed tax credits. Their results suggest that dividend taxes affect share prices in New Zealand and that foreign investors are significant players in the New Zealand capital market. However, their study does not provide any valuation of dividends and dividend imputation tax credits.

Cliffe and Marsen (1992) study the impact of the New Zealand dividend imputation system on company financing decisions and the cost of capital. They suggest that dividends would be irrelevant under New Zealand's imputation regime, which was based along the lines of the dividend clientele argument.

Howard and Brown (1992) analyse the effects of the imputation and capital gains taxes on the dividend and financing decisions using Australian data. They develop a framework where interactions between dividend and financing decisions could be studied. The significance of these interactions depends on both the corporate dividend policy and the relationship between personal and corporate income tax rates.

Using the model they developed, Howard and Brown (1992) identify three important features of the dividend imputation system. First, if all company profit is paid out as dividends, then the company's profit is effectively taxed only at the shareholders' personal marginal tax rate. Moreover, the amount of

corporate tax is independent of the company's tax rate and thus the company tax paid is essentially a withholding tax against the personal tax liabilities of individual shareholders. Second, Howard and Brown point out that if all company profit is taxable and no dividends are paid, then the retained earnings of the firm are taxed twice, once at the corporate income tax rate and again at the capital gains tax rate. Lastly, in the case of New Zealand, where there is no capital gains tax, and the corporate tax rate is the same as the personal tax rate.[15] Howard and Brown point out that if the dividend payout is fully imputed, then there will be no tax differential. In other words, investors should be indifferent in terms of receiving their income in the form capital gains or dividends.

This chapter described both the classical and dividend imputation tax systems and contrasts the features of the two systems. In addition, it provided a look at the issue of the foreign investors' tax credit, as well as institutional investors. This chapter provided insight into the unique features of the New Zealand dividend imputation system, which will assist in the development of testable hypotheses in Chapter 4.

[15] The personal marginal tax rate starting the tax year of 2002 has been changed and now exceeds the corporate tax rate by six percent.

CHAPTER 4

DEVELOPMENT OF TESTABLE HYPOTHESIS

4.1 The Tax-Induced Dividend Clientele

Miller and Modigliani (1961) suggest that if there is a relationship between the dividend yield distribution and the distribution of individual preferences for the payout, this will lead firms to attract a "clientele" of investors preferring their dividend policies, but each clientele will be similar to the others in terms of valuation.

Elton and Gruber (1970) examine Miller and Modigliani's hypothesis by using the average price decline on the ex-dividend day to estimate the implied marginal tax rate of the average investor. They find an inverse relationship between the implied tax bracket and the average price decline as a percentage of dividends paid. They conclude that investors in a high tax bracket will hold company stocks with a low dividend yield, while investors in low tax brackets will hold company stocks that pay high dividends. Their results are consistent with the Miller and Modigliani hypothesis.

It is important to point out that the Miller and Modigliani hypothesis and the Elton and Gruber results have been derived on the basis of the US system where a classical tax regime applies. Under such a system, there is a difference between the effective tax rates on dividends (ordinary income) and capital gains. Most dividends received by individuals are added to other income and are taxed at rates up to 50 percent[16]. Since corporations pay dividends out of earnings that have already been taxed, there is double taxation of corporate income. The treatment of a capital gain depends on whether the gain is a short-term or long-

[16] The 50 percent tax rate is no longer applicable since 1986.

term capital gain. Short-term capital gains are taxed at the same rate as ordinary income, while the top rate on a long-term capital gain is 20 percent. Capital gain tax rates have varied over time, but they have generally been lower than rates on ordinary income.

Conversely, under New Zealand's imputation tax system, individuals are expected to be indifferent in terms of receiving their income in the form of dividends or capital gains as compared to investors in the classical tax regime. This discussion implies that the tax-induced dividend clientele (if any) will be less obvious under the New Zealand imputation tax system relative to the classical tax regime.

The argument for the possibility of tax differential between dividend and capital gains is due to the fact that under the New Zealand tax regime active fund managers receiving dividends with imputation credits attached will prefer them to taxable capital gains which do have the relief from taxation provided by imputation credit. However, as only realized capital gains are taxable the strength of the preference for dividends may be debatable.

However, the size of managed funds (both active and passive) represents a small percentage of total investments by New Zealanders. A survey published by the New Zealand Stock Exchange (NZSE) "Share Ownership Survey 2000" indicates that as of May 2000 only nine percent of the total New Zealand investment was invested in managed funds (both active and passive).[17] This small proportion of investment in managed funds may cast doubt on the importance of managed funds preference for dividends over capital gains and whether this preference affects or dominate the entire market. Therefore, the assumption that there is less tax differential between dividend and capital gains

[17] The survey show that the percentages of New Zealand investments where distributed as follow: investment property (25%), cash related products (22%), fixed interest products (17%), superannuation (16%), managed funds (9%), shares listed on the local market (11%), and derivatives (1%).

under the New Zealand tax regime relative to the classical tax system is not an unrealistic one.

Specifically, under the classical tax regime, there is a negative relationship between the dividend yield and the individual's implied marginal tax rate. Under the New Zealand imputation tax system and in relatively less tax differentials between capital gains and ordinary income, it is anticipated that there will be no significant relationship between dividend yield and the implied marginal tax rate. And if taxes are the main determinants of the ex-dividend day stock price behaviour, one should observe a drop off ratio equal to one. This leads to the first testable hypothesis with regard to dividend clienteles under the imputation tax system.

Hypothesis 1: The relationship between dividend yield and the individual implied marginal tax rate is negative and statistically significant.

The dividend clientele hypothesis implies that if investors focus their stock holdings on the basis of dividend yields, the distribution of dividend yields would resemble a bimodal distribution with one mode close to zero and the other centred at some high level that is not theoretically specified (see Elton and Gruber, 1970, and Kim Lewellen, and McConnell, 1979). Under the imputation tax system it is not anticipated that a bimodal distribution will be observed. Rather it is anticipated that a distribution of dividend yields will be centered around some high level (though it is not specified) of marginal tax rates, which reflect the neutrality of investors' preferences between dividend yield and capital gains. If the correlation coefficient between dividend yield and the IMTR is negative and statistically significant and the distribution of dividend yields follows a bimodal distribution, then the results can be taken as evidence that is consistent with the dividend clientele hypothesis. If the prices on the ex-dividend day continue to drop by less than the amount of dividend even in the absence of tax differential between dividend and capital gains, then this result

would suggest that the dividend clientele which has been attributed to taxes is actually due to other factors.

4.2 Financial Leverage Clienteles

Most of the previous studies focus on either the dividend clientele or financial leverage clientele separately. Financial theory indicates that there is a linkage between financing decisions and the investment decision. In other words, dividend policy influences the decision on how firms finance investment projects and thus their degree of financial leverage. Therefore, it is important to examine financial leverage clienteles while controlling for the effects of dividend policy.

Miller (1977) includes personal and corporate tax effects in an equilibrium model of corporate leverage. He assumes a world where no personal taxes are levied on income from municipal debt and return from corporate stock, while income from corporate debt is taxed at the marginal, ordinary personal income tax rate. The ordinary personal income tax rates progress from below to above the corporate income tax rate.

Miller concludes that there would be an equilibrium level of aggregate corporate debt in the economy, and the value of an individual firm would be invariant to its capital structure. In addition, he suggests that low leveraged firms would find a natural clientele for their securities among investors in high tax brackets, while investors in low tax brackets would prefer highly leveraged firms.

Kim, Lewellen and McConnell (1979) test for financial leverage clienteles by constructing hypotheses using Miller's assumptions concerning taxes and his assumptions that municipal and corporate debt are riskless, agency costs are insignificant, capital markets are complete, and personal tax arbitrage is prohibited. They predict a bimodal distribution of leverage ratios, with one

mode centred at zero and the other centred around some high, but theoretically at an unspecified level. They also anticipate a negative correlation between tax rates of shareholders and debt ratios of firms. Since they find an insignificant negative correlation, they conclude that either their test procedure or their model of financial leverage clienteles is inadequate.

Taggart (1980) extends the analysis of financial leverage clienteles by relaxing the assumptions of complete markets and insignificant agency costs. He concludes that investors will not line up perfectly in tax bracket clienteles and that shareholders preference for capital structure policy will not be unanimous.

Miller (1977) and Kim, Lewellen and McConnell (1979) argue that in equilibrium, the corporate tax savings from interest deductions will be offset completely by the "grossed-up" interest payment necessary to induce the marginal investor to hold corporate debt. In this way there is no optimal leverage for the individual firm and its value is independent of its capital structure, but there will be an economy wide debt equity choice.

The above conclusion raises the question of what causes individual firms to issue risky debt when there is no tax advantage from this action. Kim, Lewellen and McConnell extend the work of Miller and argue that the existence of personal and corporate tax combination give rise to financial leverage clienteles. Individuals in high tax brackets will prefer to hold the stocks of unlevered firms, since their tax savings on personal leverage exceeds the tax savings on corporate leverage. Individuals in low tax brackets will prefer to hold stocks of levered firms, since their tax savings on corporate leverage exceed the tax savings on personal leverage. If the management of a firm wants to maximize shareholders' wealth, it can respond to the demand by specialising their capital structure in one or the other extreme.

A shortcoming of previous empirical tests of tax-based investor dividend clienteles is that these tests have not controlled for leverage. Conversely, tests

for leverage clienteles have not controlled for the influence of dividend policy. McCabe (1979) and Peterson and Benesh (1983) examine the interdependence between investment, financing, and dividend decisions and find evidence supporting interdependence. They also conclude that if a firm's investment decisions are held constant, the higher its dividend payout, the greater its need for external financing. Therefore, a firm's dividend policy may affect both its use of debt financing and the tax-status of investors attracted to the firm's stock. In order to test for financial leverage clienteles, it is necessary to control for dividend policy and vice versa.

Most empirical studies tend to treat dividend and financing policies as two separate problems. The implication of this separation is the possibility that the results of tests for leverage clienteles have been influenced by dividend policy or visa versa. The New Zealand imputation tax system provides a unique opportunity to examine financial leverage clienteles in the absence of dividend policy influence. This implies that any observed financial leverage clienteles should be largely free from dividend policy influence. While there might be some influence of dividend policy on leverage under the imputation tax system due to other factors than taxes, such as investment opportunities, this influence must be lower compared to the case under the classical tax system.

Under the assumption of efficient capital markets without tax effects, it makes no difference whether borrowing is done at the corporate or the investor level. Based on their risk tolerance, investors will select an overall level of debt relative to assets. Once income taxes are introduced at the corporate and investor levels, investors facing marginal tax rates higher than the corporate tax rate will benefit from self-leveraging, while investors facing a tax rate lower than the corporate tax rate will benefit from leveraging at the corporate level. Because of this, there should be an inverse relationship between investor tax rates and financial leverage. Specifically, it is expected that companies following low leverage policies will have shareholders in high tax brackets and that firms following high leverage policies will have shareholders in low tax

brackets. In addition, financial leverage ratios follow a bimodal distribution with one mode centred at zero and the other centred around some high, but theoretically unspecified, level.

The theory of leverage clienteles suggests that, once the target leverage is chosen, the relationship between the investor's tax rate and the corporate tax rate determines whether the investor benefits more from self-leveraging or from borrowing at the corporate level, Kim, Lewellan and McConnell (1979). The foregoing discussion leads to the following testable hypothesis:

> *Hypothesis 2: The relationship between financial leverage and stockholders' implied marginal tax rates is expected to be negative and statistically significant.*

Evidence related to the presence or absence of financial leverage clienteles provides a test of Miller's (1977) model. While a positive finding would not constitute proof that Miller's proposition is correct, it would be supportive of his position. Similarly, although a negative finding would not allow rejection of his proposition, it would at least raise some doubts. The presence or absence of financial leverage clienteles should be of significant interest to financial managers and have important implications related to capital structure theory. Positive findings would suggest that financial managers should tailor their capital structure policies to suit shareholders' tax-induced demand, while negative results indicate that such concerns are not justified.

4.3 The Joint Clientele

As noted above, one problem with previous studies is that tests for dividend clienteles have not controlled for leverage, and tests for leverage clienteles have not controlled for dividend policy. Therefore, a firm's dividend policy may affect both its use of debt financing and the tax-status of investors attracted to

the firm's stock. In order to test for financial leverage clienteles it is necessary to control for dividend policy and vice versa.

Table 4.1 summarizes the relationship between the investor implied marginal tax rate, dividend yield, and financial leverage for dividend clienteles, financial leverage clienteles, and the joint clientele hypothesis.

Both the dividend and financial leverage clientele theories (jointly) assert that low tax bracket individuals will be attracted to companies with high dividends-high financial leverage (Case 1 in Table 4.1), while high tax bracket individuals are attracted to companies with a low dividend yield-low financial leverage (Case 2 in Table 4.1). The prediction about the IMTR for companies with low dividend yield – high financial leverage (Case 3 in Table 4.1) or companies with high dividend yield – low financial leverage (Case 4 in Table 4.1) is however indeterminate on the basis of the dividend and leverage clientele theories and it must be estimated empirically.

TABLE 4.1

The Anticipated Level of the Investors Implied Marginal Tax

The anticipated level of the investors implied marginal tax bracket as predicted by dividend clientele, financial leverage clientele, and the joint clientele hypothesis. Dividend yield is the amount of dividend divided by the market price per share the day before the ex-dividend day; financial leverage is calculated using different measure of leverage.

Case No	Investors Implied Marginal Tax Bracket	Dividend Clientele	Leverage Clientele	Joint Clientele
		Dividend Yield	Financial Leverage	Dividend Yield and Financial Leverage
1	Low Tax	High Dividend Yield	High Financial Leverage	High Dividend Yield and Financial Leverage
2	High Tax	Low Dividend Yield	Low Financial Leverage	Low Dividend Yield and Financial Leverage
3	TBE	Low Dividend Yield	High financial Leverage	Low Dividend Yield and High Financial Leverage
4	TBE	High Dividend Yield	Low Financial Leverage	High Dividend Yield and Low Financial Leverage

TBE = the level of the investors implied marginal tax rate is not defined and will be estimated for Case 1 and Case 2

Source: Generated by author

The implication of the joint clientele hypothesis is that managers should respond to investor demand by specialising their capital structure and dividend policy to one of the two extremes. This logic leads to the following hypothesis related to the joint clientele effect.

> *Hypothesis 3: The relationship (measured by the correlation coefficient) between a) the investors' implied marginal tax rate and b) dividend yield and financial leverage is expected to be negative and statistically significant.*

In addition, if the relationship between the investor's implied marginal tax rate and dividend yield and financial leverage is as described in Case 1 and Case 2 in Table 4.1, then a bimodal distribution where financial leverage and dividend yield are centered around one for Case 1 and around zero for Case 2 are expected to be observed.

It is important to point out that the average investor's implied marginal tax rate for Cases 3 and 4 provides the opportunity to develop additional evidence that supports or refutes the joint clientele hypothesis by examining the difference in the implied marginal tax rates between cases 3 and 4 and cases 1 and 2. A significant difference will be consistent with the joint clientele hypothesis. Lack of a statistically significant difference between the two groups can be taken as evidence which is not supportive of the joint clientele argument. It is important to note that a test of Miller's (1977) theory based on leverage clienteles and Miller and Modigliani's (1963) dividend clienteles is a joint test of the leverage and dividend relevancy theorems and the ability to infer investors' marginal tax rates.

4.4 Financial Institutional Clientele

The previously discussed dividend, financial leverage, and joint clientele are based on the assumption of a tax differential between the effective tax rates on capital gains versus ordinary income. Under the New Zealand imputation tax regime where the effect of tax differential between dividend and capital gain is much smaller relative to the classical tax system, the existence of a clientele can be attributed to factors other than taxes. The following section provides two competing explanations of the existence of a non-tax dividend clientele under the New Zealand dividend imputation tax system. These are the institutional clientele and foreign investor's clientele explanations.

Allen et al. (2000) provide a signalling model to explain the existence of institutional clienteles. Their signalling model is built on the assumption that managers have inside information about the quality of their firms while institutions are better able to discover this information than retail investors. Institutional investors have greater incentives to become informed about the firm and are more likely than retail investors to conduct due diligence to discover whether a particular firm is poorly or well managed. They are also

more likely to institute or initiate mechanisms by which potential shortcomings are corrected.

Dividends exist to signal that a firm's management is "good" because paying dividends increases the chance that firm's quality will be detected by institutions. Bad firms dislike attracting institutions because institutional presence increases the probability that their quality will be revealed. In economic terms, the presence of institutional shareholdings can be associated with higher firm value because of signalling effects.

They show that in equilibrium, dividend-paying firms are a better purchase for institutions than for retail investors because dividends are taxed for individuals but are untaxed for institutions. This comparative advantage is likely to result in higher fraction of ownership by institutions for dividend-paying firms. The implication of these assumptions is that firms can attract more institutional shareholdings by paying dividends and that dividend-paying firms will perform better than non-dividend paying firms.

Under the classical tax system the effective marginal tax rate on dividends to institutional investors is less than the marginal tax rate to individual investors, while the New Zealand current tax system is relatively less discriminatory in regard to the taxability of dividend and capital gains between individual versus institutional investors in comparison to the classical tax regime. Allen et al. (2000) suggest that their model is consistent with the institutional clientele even in the absence of any tax advantages to institutional investors from dividends compared to retail investors.

Based on the previous discussion, the institutional clientele hypothesis can be stated as follows.

Hypothesis 4: Shares of firms with high dividend yields are expected to attract a clientele of institutional investors while firms with low dividend yield are expected to attract a clientele of retail investors. In addition, the relationship between dividend yield and the percentage of institutional holding is expected to be positive and significant.

4.5 Foreign Investors Clientele

The introduction of the New Zealand imputation tax system in 1988 helped to alleviate the problems associated with the classical taxation system and its double taxation of a firm's income for resident shareholders. Non-Resident shareholders or foreign investors were treated differently and were unable to participate in the imputation credits or to make use of the imputation system. The implication of this differential treatment is that taxation at the company level has different effects depending on whether the shareholders are residents or non-residents.

Several studies point out and discuss the problems associated with the imputation tax regime with regard to foreign investor tax credit. Head (1992), Winsen (1992) and Smith (1994, 1995) argue that the denial of the advantages of imputation to non-resident and foreign investors tends to discourage foreign investments and denies the country the benefits of foreign direct investments. Bellamy (1994) points out that the imputation system reduced the firm's motives to take sub-optimal operational decisions to maximize their after-tax profits. This is because such a strategy will be disadvantageous if the firm has a clientele of domestic shareholders who are able to utilize their imputation credit. In addition, Bellamy indicates that foreign and tax-exempt shareholders do not benefit from the imputation system, compared to resident shareholders. So, differential treatment between residents and non-residents creates the possibility for the existence of imputation clienteles.

On 5 August 1993, the New Zealand government introduced the foreign investors' tax credit (FITC). The benefit of dividend imputation was thereby extended to non-resident portfolio investors (those with less than a 10 percent interest in terms of voting power or market value) while the tax position of all New Zealand resident remained the same as before. On 12 December 1995, FITC was extended to all foreign investors regardless of investment percentage.

The introduction of FITC increases the after tax cash flow to foreign investors by the amount of supplementary dividends. This, in turn, may cause the valuation and the demand for higher dividend shares to increase. In addition, FITC may cause the percentage of foreign investors relative to domestic investors to increase. Since foreign investors are in higher tax brackets, they tend to invest in companies which pay higher dividends (Liljeblom, Loflund, and Hedvall, 2001). Thus the foreign investors' clientele hypothesis can be stated as follows:

Hypothesis 5A: For the period after 1995, firms with high dividend yields are expected to attract a clientele of foreign investors in high tax brackets (high IMTR) while firms with low dividend yields are expected to attract lower tax bracket (lower IMTR) investors.

Hypothesis 5B: The difference in the degree of foreign investors and the IMTR for the period before and after 1995 is expected to be statistically significant.

4.6 Investors' Heterogeneity and the Drop off Ratio

Another issue which might affect the drop off ratio is the identity of the marginal investors. One of the assumptions implicit in Elton and Gruber's (1970) analysis of drop off ratios is the homogeneity of the tax status of the marginal investors. However, the presence of heterogeneous investor groups may cause the drop off ratio to differ from one which will affect the tax

interpretation to the ex-dividend day stock behaviour. Hietala and Keloharju (1995) and McDonald (2001) provide evidence that the drop off ratio differs between domestic and foreign investors in the Finnish and the German markets.

The New Zealand tax regime provides for three classes of investors distinguished by their tax situation and trading pattern. First, there are arbitragers or short-term traders, which include resident shareholders, institutional investors, and individuals who are involved in ex-dividend day arbitrage. For this class, both dividend and capital gains are taxed at 33 percent, and both transaction costs and losses are tax deductible. Second, there are portfolio traders, which includes resident share traders, and institutional investors who trade for asset allocation (not for arbitrage). For this group both dividend and capital gains are taxed at a rate of 33 percent and the transaction costs are tax deductible. The third class is long-term portfolio investors, which includes individual investors who cannot be classified as share traders, and passively managed index funds. This group is taxed only on dividend income.

Institutional investors (as opposed to retail investors), and foreign investors (as opposed to domestic investors) may be argued to represent different heterogeneous groups. The drop off ratio and the IMTR can be used to test for the impact of investor heterogeneity. The lack of a significant difference in the IMTR between companies with a higher percentage of institutional holding (relative to companies with low institutional holdings) and between companies with a higher degree of foreign investors (relative to companies with low degree of foreign investors) will support the argument that investors' heterogeneity does not affect the drop off ratio. Further, it does not influence the results of this study and it will be consistent with argument that marginal investors in aggregate determine market prices by their collective activities, whereas individually they remain price takers (Bowman, Cliffe, Navissi, 1992).

The next chapter describes the data collection employed and the cross-sectional analysis where each of the previous hypotheses can be examined, taking into consideration the effect of additional variables. The purpose of the cross-sectional model is to identify the dividend policy determinants and determine the hypothesis, which explains firm dividend policy.

CHAPTER 5

DATA DESCRIPTION AND METHOD OF ANALYSIS

5.1 Data Description

5.1.1 Time Period of the Study

The time period covered in this study is from 1 January 1989 through 31 December 2000, a total of 12 years. The reasons for selecting this lengthy period are as follows. First, it is important to have a large number of company observations with dividend payments. The New Zealand capital market is small in comparison to other markets such as the US and the UK. The New Zealand stock market has a limited number of listed companies which pay dividends regularly. Thus, extending the time horizon of this study allows the analysis of a larger number of firms that pay dividends. This will lead to more reliable estimates of the variables used in this study. Second, a longer time period will make it possible to test for before, and after, the 1993 FITC [18]on both dividend and leverage clienteles. Third, the time period starts with 1 January 1989, as this is the first year that the dividend imputation system became effective. Before 1989, New Zealand was using a classical tax system.

5.1.2 Sources of the Data

The data used in this study were obtained from the Datex and DataStream databases. Datex provides a comprehensive regularly updated analysis of New Zealand listed company data including annual reports financial data,

[18] FITC was introduced on 28 September 1993 in which the benefits of the imputation tax credit was extended to foreign investors except for non-resident portfolio investors with ownership of 10 % or more in resident company. On 12 December 1995 the Government extended the FITC regime to all foreign investors.

announcements, daily share price histories, daily indices, and dividend diary information. DataStream is a comprehensive database that provides company accounts' data and market prices for many countries including New Zealand.

5.1.3 Restrictions Imposed on the Final Sample

In order to be included in the final sample, each company must satisfy the following data filters.

a) The company paid an ordinary dividend during the period of the study. Companies without dividend payments were excluded because dividend data is needed to estimate the implied marginal tax rate.

b) The company is listed on the New Zealand Stock Exchange so dividend payments, market prices, and other company account information are available.

c) Market prices were available on the ex-dividend day and the day before ex-dividend day to obtain the implied marginal tax rate estimate. If the prices were not available due to lack of trading on these days, then the company was excluded for that particular period[19].

d) It is also important to note that, following Elton and Gruber (1970), and Kim Lewellen and McConnell (1979) studies, payments of special cash or stock dividends were not included in the analysis. As stock dividend is equivalent to a small stock split. It increases the number of shares outstanding without changing any of the underlying risk or return characteristics of the firm.

[19] Due to the small size of New Zealand market, many stocks were not traded for several days. This reflects thin trading activities, especially for small size companies.

e) Thus, stock dividends[20] do not have a tax implication for stock prices. Special cash dividends are normally the proceeds from the sale of certain assets, or a subsidiary. It may therefore have implications other than a tax strategy.

f) Observations which are contaminated by confounding events on the ex-dividend day or the day before, such as mergers, restructurings, earning announcements or other major events were excluded from the sample, because the behaviour on stock prices on the ex-dividend day may be reflect these events rather than tax effects.

In some cases, dividend payments were reported in terms of currencies other than the New Zealand dollar, mainly the Australian dollar and the British pound[21]. Dividend payments were converted into New Zealand dollar equivalents using the exchange rate available on the ex-dividend day when necessary. Table 5.1 provide a description of the reasons for exclusion to reach the final sample for the periods (1989-1993) and (1996-2000).

[20] Stock Dividend is paid out in shares of stock. It is not a true dividend, because no cash leaves the firm. Rather, a stock dividend increases the number of shares outstanding, thereby reducing the value of each share. Stock dividends are similar to stock splits in that they "divide the pie into smaller slices" without affecting the fundamental position of the current stockholders.

[21] Some companies distribute dividends in foreign currencies. For example, Telstra Corporation, AXA Asia Pacific Holding Ltd., Infratil Australian Ltd., Goodman Fielder Ltd., Colonial First State Property (NZ) Ltd., Colonial Ltd., AMP Ltd. pay dividends in Australian dollars, and Guinness Peat Group PLC pays in British Pounds.

Table 5.1

The Initial Sample of the Companies Examined and the Reasons for Exclusion

Reasons for Exclusion	Period Covered	
	1989-1993	1996-2000
Total number of companies listed on NZSE*	101	161
No dividends paid by the company	35	47
Company is a trust and does no pay ordinary dividends	6	14
Prices are not available on the ex-dividend day or the day before	5	2
Major news where released on the ex-dividend day or the day before the ex-dividend day	1	2
Final sample	54	96

* This number does not reflect the number of companies listed on NZSE at a given year, during the sample period some companies entered the sample while others are de-listed. As of December 2000 there are 151 companies listed on the NZSE (www.nzse.nz).

Source: Generated by author

5.1.4 Definition of the Variables

This section provides the definition, the sources, and explanation of the method used to calculate each variable in this study. The section is organized into two groups of variables. The first group of variables is related to dividend clienteles, and the second group is variables related to leverage clienteles.

5.1.4.1 Variables Related to Dividend Clienteles

a) Dividends per Share

Dividends per share are reported in term of cents per share. Most New Zealand companies pay dividends twice a year. The first payment is called the Interim dividend and the second is termed the Final dividend. In a few cases, some firms paid quarterly dividends. For example, Telecom Corp of New Zealand moved to a quarterly system of paying dividends in 1995. It is important to point out that dividends are reported in terms of one hundredth of a cent e.g. 14.75 cents, and stock prices on the ex-dividend day are allowed to trade on the

same basis. This is different from the stock price reporting in the US, where the stock price movements are limited by tick size: 1/8 of a dollar or $0.125[22].

b) Imputation per Share

New Zealand adopted the dividend tax imputation system in April 1988, and companies started to attach dividend imputation tax credits in 1989. Imputation tax credits are reported in cents per share and were collected from the Datex database over the period 1989-2000.

c) Supplementary Dividend per Share

New Zealand implemented the FITC in 1993. Under FITC, foreign investors are allowed to participate in the imputation tax credit in the form of supplementary dividend payments. The supplementary dividends are reported in cents per share and are available only after 1993.

d) Market Price per Share before the Ex-Dividend Day

The closing market price per share the day before the stock goes ex-dividend is required to calculate the implied marginal tax rate and dividend yield. If there was no trading on that day, then the company was excluded from the calculation of the investor's implied marginal tax rate for that particular period. For the period between 1989 and 1995 the market prices were collected from DataStream. For the period between 1995 through 2000 the market prices were collected from Datex, which provides information for the most recent five years. DataStream is a comprehensive data source for New Zealand companies though it covers the most active companies and is used to complement Datex. The data

[22] In 2001 stocks traded on NASDAQ are no longer reported using tick size, but stocks traded on the New York Stock Exchange and American Stock Exchange are still reported on a tick size basis.

from both sources were verified for consistency. Datex report the closing market price per share, the highest, and the lowest price, and it does not report the open market price per share.

e) Market Price per Share on the Ex-Dividend Day

The closing market price per share on the ex-dividend day is also required to calculate the implied marginal tax rate. Market prices were collected from the same sources as above. Share prices and trading for companies listed on the NZSE are not restricted by tick size (as is the case in the US), and while the majority of the prices are quoted to the nearest cent, it is common to observe that share prices are traded and quoted at a fraction of a cent. For listed companies where share prices are quoted to the nearest cent, dividends are paid to the nearest cent in most cases. Thus, tick size effects (if any) will have less impact on the results of this study as an explanation of the ex-dividend day stock price behaviour than reported in US based studies.

g) Price Difference

Price difference is defined as the closing market price per share the day before the stock goes ex-dividend minus the closing market price per share on the ex-dividend day. The difference is expressed in cents per share. This study assume that the movement in share prices between the ex-dividend day and the day before ex-dividend is due to dividend payments since share prices for the two days and for each company were averaged across different dates and over different time periods. So the influences of negative and positive market movement are assumed to offset each other. This approach and the procedures with regard to using the closing market prices per share are similar to those of Harris, Roenfeldt, and Colley (1983), Kim, Lewellen and McConnell (1979), Hietala and Keloharju (1995), and Bauer, Beveridge, and Sivakumar (2002).

h) Deviation

Deviation is defined as the dividend per share minus the price difference as defined above. A positive deviation implies that the market price per share on the ex-dividend day dropped by less than the amount of dividend. A deviation of zero indicates that the market price dropped by an amount equal to the amount of the dividend on the ex-dividend day. Deviations are expressed in cents per share

i) Elton and Gruber Ratio (EGR) or the Drop off Ratio

EGR is defined as the price difference (as defined above) divided by dividend per share. If the price on the ex-dividend day drops by the amount of dividend, then EGR will equal one. If the market price on the ex-dividend day dropped by less than the amount of dividend, then the ratio will be less than one. This ratio is also referred to as the drop off ratio and it indicates the percentage change in the market price per share on the ex-dividend day relative to the amount of dividend paid.

i) Investor Implied Marginal Tax Rate (IMTR)

IMTR is defined as one minus EGR or (1-EGR). For each individual observation, if the prices drop by more (less) than the amount of dividend, EGR will be greater (less) than one and the IMTR will be negative (positive).

j) Dividend Yield (DY)

DY is defined as the dividend per share divided by the market price per share on the day before the ex-dividend day. It represents that portion of the total return that investors will receive in the form of dividend relative to the investor's initial investment, which is represented by the market price of one share of

common stock of specific company. The total rate of return from holding the security for one period is defined as follows:

$$R_t = [(P_t - P_{t-1}) / P_{t-1}] + [D_t / P_{t-1}], \quad (5.1)$$

Where:

R_t = the total rate of return for period t,

P_t = the market price per share at period t,

P_{t-1} = the price per share at period t-1, and

D_t = dividend per share at period t.

The first part of the equation represents capital gains (or losses), whilst the second part is the dividend yield. If the company decides to increase dividend payment, dividend yield will increase and capital gain is expected to decline because share prices (at least in theory) should drop by the amount of dividend on the ex-dividend day. For this reason dividend yield is used as a proxy for the firm's dividend policy.

EGR and the investor's marginal tax rate were calculated for each dividend payment whether the payment is an initial dividend or a final one. The average of the EGR and IMTR is then calculated for each year. The same procedure was performed in cases where the dividend was paid on a quarterly basis. The annual averages are used to calculate the overall average for each company across all years with available data. While the time period covered in this study extends from 1989 through 2000, many companies do not have sufficient data to be included, especially in the early years of the study. The number of companies with available data over the study's period ranges from 54 for the period (1989-1993) to 96 for the period (1996-2000). The overall average shows that the number of firms with data available during the study period is103 companies[23]. The reason for this difference is related to the fact that during the study some

[23] The number of firm-year observations over the period from 1989-2000 is 727.

companies entered a particular sample period while others disappeared for a variety of reasons.

5.1.4.2 Variables Related to Leverage Clienteles

This study utilizes different measures of financial leverage to examine the leverage clientele hypothesis, which in turn requires company account data. Appendices C, D, and E provide summary statistics of the variables used to calculate the different degrees of financial leverage. These measures are defined below.

a) First Measure of Financial Leverage (LEV1)

The first measure of financial leverage is defined as long-term debt divided by long term capital. Long-term debt is measured as the book value of long-term debt, while long-term capital is measured as the total book value of long-term debt plus the book value of equity.

b) Second Measure of Financial Leverage (LEV2)

The second measure of financial leverage is defined as total liabilities divided by total assets. Total liabilities are the book value of all liabilities (current plus long-term), and total assets are the book value of all assets.

c) Third Measure of Financial Leverage (LEV3)

The third measure of financial leverage is defined as long-term debt divided by long-term debt plus market value of equity.

Data used to calculate leverage ratios, such as long-term debt, equity, total liabilities, total assets, interest expense, and operating income, is based on the average of all years from 1989 through 2000 with available data.

5.2 Estimation of Individual Investor's Marginal Tax Rate

Elton and Gruber (1970) derive an estimator for the implied individual investor's marginal tax rate. This estimator is based on the change in the market price per share when it goes ex-dividend. If an individual investor purchases a stock just prior to the ex-dividend date, she/he would receive the dividend payment less the additional tax on the cash dividend:

$$D - t_d D = D (1-t_d), \tag{5.2}$$

Where:

D = the cash dividend on the ex-dividend date, and

t_d = the investor's marginal ordinary tax rate.

If the individual investor purchases the stock on the ex-dividend date, he/she will save on the initial purchase price but will pay a capital gains tax on the future. The incremental present value of purchasing the stock on the ex-dividend date equals:

$$(P_b-P_a) - (P_b-P_a)\, t_g / (1+k)^n = (P_b-P_a)\, (1- t_g /(1+k)^n), \tag{5.3}$$

Where:

P_a = the market price per share on the ex-dividend date,

P_b = the market price per share the day before ex-dividend day,

t_g = the tax rate on the future capital gain,

k = the investor's required rate, and

n = the number of years that the investor intends to hold the stock.

Since investors are free to delay their purchase one-day, equilibrium prices of the stock would occur when investors were indifferent between the two purchase prices. Setting the right sides of equations 5.2 and 5.3 equal to each other will show this condition:

$$D\,(1-t_d) = (P_b-P_a)\,(1-t_g)/\,(1+k)^n. \qquad (5.4)$$

Solving equation (5.4) provides an estimate for the marginal investor's tax rate of an individual firm:

$$t_d = 1 - ((P_b-P_a)/D)\,(1-t_g/\,(1+k)^n). \qquad (5.5)$$

Elton and Gruber assume that the investors' time horizon is short and that the discount factor is insignificant; $t_g / (1+k)^n$ is close to t_g. Therefore, their estimator reduces to:

$$t_d = 1 - ((P_b-P_a)/D)\,(1-t_g), \qquad (5.6)$$

or

$$(P_b-P_a)/D = (1-t_d)/\,(1-t_g). \qquad (5.7)$$

The statistic $(P_b-P_a)/D$ represents the ex-dividend behaviour that causes a shareholder with a particular set of tax rates, t_d and t_g to be indifferent as to the timing of purchase and sale of a common stock.

5.3 Cross-Sectional Analysis

The purpose of this section is to describe the cross-sectional regression model used to examine the dividend, financial leverage, joint, institutional and foreign investor's clienteles after controlling for the effect of other variables such as firm size, growth potential, variability, and profitability of the firm. The model is also used to try and determine which one of these theories best provides an explanation of firm dividend policy.

The cross-sectional model explains the determinants of dividend policy and explore whether dividend clientele, leverage clientele, institutional clientele, or foreign investor clientele and dividend behaviour matter in the New Zealand market. A cross-sectional model tests for these relationships. Dividend yield is the dependent variable used as a proxy for dividend policy, several studies use the same procedures, such as Barclay and Smith (1988) and Litzenberger and Ramaswamy (1980). For each theory and argument developed, a proxy has been used to test for that theory and included as an independent variable. The following section develops the rationale and explains and defines each of those variables, and shows the data collection procedures for each.

5.3.1 Dependent Variable

Previous studies such as Elton and Gruber (1970), Litzenberger and Ramaswamy (1980), Barclay and Smith (1988) and Barclay, Smith and Watts (1999) utilize dividend yield as a proxy for the firm's dividend policy. Following other researchers this study utilizes dividend yield as the dependent variable in the regression. As previously described, dividend yield was calculated for each dividend payment within a year to obtain the average annual dividend yield. The overall average dividend yield for each firm was then obtained by calculating the average of all annual averages over the period of the study.

5.3.2 Independent Variables

5.3.2.1 Investment Opportunities (TQ)

Barclay, Smith, and Watts (1999) indicate that companies with few investment opportunities can restrict management's temptation to over-invest by paying out a larger percentage of their income as dividends, and for this reason one would expect higher dividends in stable, low-growth companies. In contrast, high-growth companies with many investment opportunities are more likely to pay

low dividends because they have profitable uses for the funds. Basically, slow-growth firms tend to use higher dividends to address a potential overinvestment problem[24]. High-growth firms pay low dividends to guard against an under investment problem.

The implication of Barclay, Smith, and Watts' analysis is that firms with assets consisting primarily of growth opportunities are likely to pay low dividends and use equity rather than debt. For such firms the underinvestment problem associated with high leverage is likely to be significant. A high-dividend policy could also impose substantial flotation costs by forcing the firm to raise equity on unfavourable terms.

On the other hand, firms whose value consists largely of assets in place are likely to have higher leverage ratios and higher dividend payouts. For those firms, the temptation to under-invest is likely to be far less costly, and both high leverage and high payouts can provide benefits by controlling management's inclination to over-invest.

This argument indicates that a firm's choice of dividend payout policies is determined in large part by the extent of their investment opportunities. The greater these opportunities the lower should be the firm's dividend yield. This implies that there is a negative relationship between dividend yield and the proxy for investment opportunities. To empirically test for the relationship between investment opportunities and dividend yield, a measure of investment opportunities or growth options is required.

Because share prices should reflect intangible assets such as growth opportunities but corporate balance sheets do not, one can argue that the larger the firm's "growth options" relative to its "assets in place," the higher its market

[24] The overinvestment problem refers to the case where management tends to invest in projects with negative net present value because they have excess free cash flow to increase the size of their firms which in turn may increase the size of their compensation.

value will be, on average, in relation to its book value. Thus, a company's market-to-book-ratio will be used as a proxy for its investment opportunity set (Barclay, Smith, and Watts, 1999). The market-to-book-ratio variable is also known as Tobin's Q ratio (TQ).

Tobin Q Ratio is utilized as a proxy of firm's investment opportunities. Tobin Q ratio is defined as the market value of the firm divided by the book value of the firm. The market value of the firm was calculated as the average annual market price per share the day before the ex-dividend day multiplied by the average number of shares outstanding for that particular year. Annual Tobin's Q was calculated for each year with available data. The overall average was found by taking the average of annual average TQ ratios following Fama and French (2001).

5.3.2.2 The Implied Marginal Tax Rate (IMTR)

Under the classical tax regime, the existence of a dividend clientele implies that high tax bracket individuals will hold the stocks of firms with low dividend yields while low tax bracket individuals will hold the stock of firms with high dividend yields. This implies that there is a negative relationship between dividend yields and the individual implied marginal tax rate. Under the New Zealand imputation tax system and with minimal tax differential between capital gains and ordinary income, it is anticipated that no significant relationship between dividend yields and the implied marginal tax rate will be found. Bellamy (1994) reports that the imputation tax credit is not fully utilized under the New Zealand dividend imputation tax system and foreign investors do not enjoy the advantages of the dividend imputation tax credit. This situation may create the possibility for the existence of imputation clienteles. New Zealand residents may prefer companies with high dividends, while foreign investors may prefer companies with low or no dividends. To test for this possibility the estimates of the implied marginal tax rate is utilized in the cross-sectional regression model.

The IMTR is defined as (1- EGR) where EGR is calculated as the market price per share the day before the ex-dividend day minus the market price per share on the ex-dividend day divided by dividend per share. The EGR ratio was calculated for each year and for both the interim and final dividend payments. The average of the interim and the final dividends were then calculated to obtain annual average EGR for the year. The average of all years' IMTR was calculated to obtain the overall average of IMTR in the sample period. This variable is included in the cross-sectional model to test for the relationship between dividend policy and tax clienteles.

5.3.2.3 Degree of Foreign Ownership (FINV)

A limited number of studies have examined the effect of different taxation rules for domestic and foreign investors. Booth and Johnston (1984) report different drop-off ratios for purely domestic as compared to inter-listed Canadian stocks. Hietala and Keloharju (1995) find significantly different drop-off ratios on the Helsinki Stock Exchange (HSE) for purely domestic stocks (restricted stocks which could not be owned by foreign investors) and unrestricted stocks during the time period before the tax reform of 1990. Where the average drop off ratio for restricted stocks was 0.69, which is in line with higher taxation for dividends as compared to capital gains for most market participants in Finland. During that time period, the average drop off ratio was as low as 0.17 for unrestricted shares which suggests that foreign investors have higher marginal tax rates and have preferences for capital gains as opposed to dividend. Sorjonen (1995) found opposite results in terms of somewhat higher drop-off ratios for unrestricted stocks in 1989-1992. Liljieblom, Loflun, and Hedvall (2001) found that the drop-off ratios vary with the degree of foreign ownership and conclude that the tax heterogeneity of the company's ownership structures plays a role in explaining deviations from dividend neutrality.

The introduction of the FITC on 5 August 1993 allows foreign investors to have some access to the imputation credit[25]. FITC calls for providing supplementary dividends, which are equivalent to the level of non-resident withholding tax applicable to the total dividends. On 12 December 1995, FITC was extended to all foreign investors including portfolio investors with 10 percent or more ownership in New Zealand resident company.

The introduction of FITC increases the after tax cash flow to foreign investors by the amount of supplementary dividends, which in turn may cause the valuation and the demand for companies with higher dividend yield to increase. The question of whether the FITC changes the preference of foreign investors in terms of dividend versus capital gains depends on many factors such as the tax position of foreign investors in their home country, the provisions of any tax treaties between New Zealand and the foreign investors home country, and the ability of foreign investors to mitigate tax payments through strategic structuring of their investments. For example, it might be that foreign investors subject to capital gain tax on their worldwide income may prefer to receive dividends that have withholding tax paid, as the withholding tax can be credited against foreign payable tax. This suggests that in a cross-sectional model the relationship between the percentage of foreign ownership and dividend yield could be positive or negative depending on the aggregate preference of foreign investors.

To test for this possibility, the ratio of total supplementary dividends to total dividends is utilized as a proxy for the degree of foreign ownership in the firm. The ratio is calculated as the dollar value of supplementary dividends to foreign shareholders (supplementary dividends per share multiplied by the number of shares outstanding) divided by the total dollar value of dividends (dividends per share multiplied by the number of shares outstanding). Thus, the degree of foreign ownership is defined as:

[25] The introduction of FITC in 1993 excluded portfolio investors with 10 percent or more ownership in resident company to benefit from the imputation tax credit.

Degree of Foreign Ownership = (Dollar value of supplementary dividend/
Dollar value of all dividends (5.8)

This ratio is calculated for each year over the period 1996-2000 (New Zealand companies were allowed to pay supplementary dividends for all foreign and non-resident investors after 1996)[26]. The average annual degree of foreign ownership is found by calculating the overall average for all years with available data.

5.3.2.4 Percentage of Financial Institutional Holdings (FINST)

Allen et al. (2000) signalling model indicates that the comparative advantage (between institutions and retail investors) is likely to result in higher fraction of ownership by institutions for dividend-paying firms. The implication of these assumptions is that firms can attract more institutional shareholdings by paying dividends and that dividend-paying firms will perform better than non-dividend paying firms. Allen et al. (2000) suggest that their model is consistent with the institutional clientele even in the absence of any tax advantages to institutional investors from dividends compared to retail investors.

Under the classical tax system the effective marginal tax rate on dividends to institutional investors is less than the marginal tax rate to individual investors. In contrast, the current New Zealand tax system is less discriminatory relative to the classical tax regime with regard to the taxability of dividend and capital gains between individual versus institutional investors.

To test for this argument the percentage of stocks held by financial institutions relative to the total number of stocks is utilized as a proxy for institutional

[26] The percentage of foreign ownership was calculated over the period 1996 to 2000. The period from 1993-1995 was excluded because it is considered an interim period in which foreign portfolio investors were excluded from participating in the imputation tax regime and remain effectively under classical tax regime.

holdings. In short, firms with high dividend yield are expected to attract a clientele of institutional investors while firms with low dividend yield are expected to attract a clientele of retail investors. So the relationship between dividend yield and the percentage of institutional ownership is expected to be positive in the cross sectional model.

The percentage of institutional holdings is calculated as the ratio of the number of shares held by financial institutions divided by the total number of shares outstanding.

FINST = Number of shares held by financial institutions/ Total number of shares outstanding (5.9)

The number of shares held by financial institutions was obtained from the Datex database over the period 1996-2000.

5.3.2.5 Profitability (BEP)

Basic earning power (BEP) is used as a proxy for firm's historical profitability of a firm should be an important determinant of its dividend policy, since profitable firms tend to have larger growth opportunities and use large proportion of their earnings to finance these opportunities rather paying them as dividends. Therefore, companies with high BEP tend to have lower dividend yield. BEP is measured as earning before interest and taxes divided by total assets for each company in the sample on annual bases, then the average BEP is calculated as the average of all years with available data. In the regression equation, the BEP variable is expected to be negative, which implies that the higher the profitability of the firm, the lower will be its dividend yield.

5.3.2.6 Growth Potential (GRTH)

The higher the firm's growth rate, the greater the additional funds needed to finance future expansion. The greater the future needs for capital, the more

likely is the firm to retain earnings rather than pay them out as cash dividends. Thus, higher growth potential would be associated with a lower dividend yield. As a proxy for growth potential the annualized compound growth rate in total assets is used. The annual growth rate in total assets is calculated as the percentage change in total assets from year to year over the sample period. The expected sign of this variable in the cross-sectional model is negative, which indicates that there should be a negative relationship between dividend yield and the growth rate.

5.3.2.7 Variability of Operating Income (STDTA)

Earnings variability is closely related to the firm's dividend policy and its dividend ratios. A company with a greater stability in its operating income can predict its future cash flows with a greater accuracy. Such a firm can commit to paying a larger portion of its income as dividends with less risk of cutting its dividends in the future. Eades, Hess, and Kim (1985) demonstrate that announcements of dividend cuts have an adverse impact on firm value as they document a drop of 7-8 percent in firm value upon announcements. Earnings variability is calculated as the standard deviation of annual operating income over the period of 1995-2000, scaled by the book value of total assets. The proxy for variability is expected to be negative, indicating that the higher the variability of income the lower the dividend yields.

The variability of operating income is measured as the standard deviation of annual operating income scaled by the book value of total assets; Barclay, Smith, and Watts (1999) use a similar procedure. The standard deviation of operating income ($\sigma_{NOI,i}$) is calculated as follows:

$$\sigma_{NOI,i} = \sqrt{\sum_{i=1}^{n} \left[NOI_{i,t} - \overline{NOI_i} \right]^2 / N} \qquad (5.10)$$

The scaled standard deviation SSTD is defined as the standard deviation of net operating income divided by total assets (TA):

$$SSTD = \sigma_{NOI,i} / TA \qquad (5.11)$$

The standard deviation of operating income is calculated for each company using all years with available data. The total assets are the average of total assets for all years with available data during the sample period.

5.3.2.8 Firm Size (SIZE)

Several studies (Banz (1981), Reinganum (1981)) has examined firm size effect and concluded that small firms experienced significantly larger risk adjusted returns than larger firms. Reilly and Brown (2000) suggested that firm size represent an additional risk factor that need to be considered along with beta, in such a case, investors require higher returns from relatively small firms even after allowing for beta. Given the additional risk associated with small firms and the relative illiquidity due to thin trading for small New Zealand listed companies, there is a possibility that the market require higher dividend yield from smaller firms relative to larger ones.

The natural log of total assets, market value of equity, and total sales are used as a proxy for firm size in this work. It is anticipated that the firm size variable will be negatively related to dividend yield in the cross-sectional model. Thus, a negative relationship between dividend yield and firm size will be consistent with the hypothesis that the market requires a higher total return and thus higher dividend yield from small companies to compensate for illiquidity and additional risk in comparison to larger firms.

Total assets and market value of equity are calculated as previously described. Sales are defined as the average total sales during the sample period. While the three measures can be used as a proxy for firm size, only total assets are included in the cross-sectional model as total assets are less correlated with other independent variables. Additionally, it may be noted that total assets are highly correlated with both sales and market value of equity, thus, it provides approximately the same information to the capital market.

5.3.2.9 Degree of Financial Leverage (LEV)

A firm's dividend policy may affect both its use of debt financing and the tax status of investors attracted to the firm's stock. It has been established that there is interdependence between a firm's dividend policy and its capital structure (e.g. McCabe, 1979, Peterson and Benesh, 1983). If a firm's investment decisions are held constant, then the higher its dividend payout, the greater its need for external financing. Thus, there is expected to be a negative relationship between dividend yield (a proxy for dividend policy) and the degree of financial leverage. Three measures of financial leverage have been utilized. The definition and measurement of each has been discussed earlier in this chapter.

The cross-sectional model thereby takes the following form:

$$DYIELD = \beta_0 + \beta_1 TQ + \beta_2 IMTR + \beta_3 FINV + \beta_4 FINST + \beta_5 BEP + \beta_6 GRTH + \beta_7 STDTA + \beta_8 SIZE + \beta_9 LEV + \varepsilon, \quad (5.12)$$

Where:

DYIELD = the average dividend yield and it is the dependent variable,
TQ = the average market to book value ratio,
IMTR = the average implied marginal tax rate,
FINV = the average degree of foreign ownership,
INSTIT = the average percentage of institutional holdings,

BEP = the average return on equity,

GRTH = the average growth rate in total assets,

STDTA = the standard deviation of operating income,

SIZE = the log of total assets,

LEV = the degree of financial leverage,

β_0 = the intercept of the cross-sectional model,

β_1-β_8 = the parameter estimates of the independent variables, and

ε = the error term with an expected value of zero and a standard deviation of one.

To estimate the parameters of this model the study uses the generalized least squares procedure. A test for multicollinerity has been conducted using Pearson correlation coefficients, and the variance inflation factor (VIF) procedures, while the White test has been conducted to test for heteroskedasticity.

Table 5.2 provides a summary of the dependent variables, the symbol used, and the expected sign, in the cross-sectional regression models.

Table 5.2

Summary of the Independent Variables and their Expected Sign

Summary of the independent variable included in the cross-sectional model, the symbol, and the anticipated sign, for both models.

Independent Variable	Symbol	Expected Sign
Investment Opportunities	TQ	Negative
Implied Marginal Tax Rate	IMTR	Negative
Foreign Ownership	FINV	Positive
Institutional Holdings	FINST	Positive
Profitability	BEP	Negative
Growth Potential	GRTH	Negative
Variability	STDTA	Negative
Firm Size	SIZE	Negative
Financial Leverage	LEV	Negative

Source: Generated by author

5.3.3 Tests for Multicollinearity

Multicollinearity refers to the effect on the precision of regression parameter estimates, of two or more of the independent variables being highly correlated, Lee (1993). To test for multicollinearity in the cross-sectional model, the Variance Inflation Factor (VIF) is calculated for each explanatory variable in the cross-sectional equation. The variance inflationary factor is defined as:

$$VIF_i = 1/(1-R^2), \qquad (5.13)$$

Where:
VIF_i = Variance inflationary factor for the ith independent variable, and
R^2_i = is the coefficient of determination for the ith independent variable.

If a set of independent variables is uncorrelated, then the VIF for the ith variable is equal to 1. Researchers have used VIF = 10 as a critical-value rule of thumb to determine whether too much correlation exist between the ith independent variable and other independent variables (see for example Marquardt, 1980). In addition to the VIF, other methods for detecting multicollinearity were performed as well, such as examining Pearson correlations. These methods are fully described by Besley, Kuh, and Welsch (1980), and a detailed explanation of how to use these methods in conjunction with the regression procedures is provided by Freund and Littell (1986).

5.3.4 Tests for Heteroskedasticity

Heteroskedasticity arises when the variances of the error terms of a regression model are not constant over different sample observations. Hetroskedasticity poses a problem when estimating the parameters of the regression model, because the least-squares estimation procedure places more weight on observations that have large errors and variances. Thus the regression line is

adjusted to give a good fit for the large-variance portion of the observations, but largely ignores the small-variance part of the data. The result is that variance estimates do not have a minimum variance. If the error terms are not independent or their variances are not constant, the parameter estimates are unbiased, but the estimate of the covariance matrix is inconsistent. This will cause errors in the statistical significance tests.

Over the estimation period, there is a possibility that the error term in the cross-sectional model is non-heteroskedastistic because of the variability in the size of New Zealand listed companies and the fact that some companies entered and left the sample during the study. To test for heteroskedasticity, the procedures described by White (1980) are utilized. The procedures provide a consistent estimate of the covariance and tests using both the usual covariance matrix and the heteroskedasticity consistent covariance matrix.

5.4 Tests for Differences between Two Means

To test for the difference between groups, the t-test for the difference between two means is used. The t-statistic, which is defined below and fully described by Lee (1993), is as follows:

$$T = (X_1 - X_2) / S\,[(N_1 + N_2)/ N_1N_2]^{1/2} . \qquad (5.14)$$

This statistic uses a t-distribution with $(N_1 + N_2 - 2)$ degree of freedom, where

$$S^2 = [(N_1-1)\,S^2_1 + (N_2 -1)\,S^2_2] / (N_1 + N_2 -2), \qquad (5.15)$$

Where:

X_1 = the mean of group one,

X_2 = the mean of group two,

S = the pooled standard deviation of the two groups,

N_1 = the number of observations in group one,

N_2 = the number of observations in group two,

S1= the variance of group one, and

S2= the variance of group two.

The next chapter presents the empirical results of this thesis. The results testing for dividend, financial leverage, foreign investors, and institutional clienteles are first presented, followed by the results of the univariate and the multivariate analysis.

CHAPTER 6

RESULTS

This chapter presents and analyzes the results testing for dividend, financial leverage, joint, foreign investors, and the institutional clienteles. In addition, it reports the results of both the univariate and the multivariate analysis.

6.1 Results of the Dividend Clientele

6.1.1 The Behaviour of Stock Prices on the Ex-dividend Day

Table 6.1 provides summary dividend and share price statistics of the final sample period from 1989 through 2000. The table shows that while the number of observations with available data for dividends per share is 103, the IPS and SUPPL variables have 101 and 100 observations. The difference in the number of observations is because some companies do not pay imputation tax credits or supplementary dividends. In addition, New Zealand companies started to pay supplementary dividends after the introduction of FITC in 1993. One of the interesting observations in Table 6.1 is that the average dividend per share is 6.378 cents while the average decline in the market price on the ex-dividend day (P_b-P_a) is 4.843. This indicates that, on average, and over a period of 12 years, prices dropped by less than the amount of dividends on the ex-dividend day, by an amount equal to 1.535 (6.378-4.843) cents per share or 62.33 percent of dividends. The average EGR is 0.686, which indicates that share prices dropped to 68.6 percent of dividend per share on the ex-dividend day.

TABLE 6.1

Summary Statistics of the Final Sample over the Period 1989-2000

Summary statistics of the final sample over the period 1989-2000. DPS are dividends per share. IPS is the imputation per share. SUPPL is the supplementary dividend per share. P_a is the market price per share on the ex-dividend day. P_b is the market price per share the day before the ex-dividend day. (P_b-P_a) is the difference in the price before, and the price on, the ex-dividend day. IMTR is the implied marginal tax rate using Elton and Gruber's (1970) equation. DY is the dividend yield, and EGR is the Elton and Gruber ratio of the change in the price relative to dividend per share.

STATISTICS/ VARIABLES	DPS	IPS	SUPPL	P_a	P_b	(P_b-P_a)	IMTR	DY	EGR
NO OF OBSERVATION	103	101	100	103	103	103	103	103	103
AVERAGE	6.378	2.412	0.759	276.484	281.327	4.843	0.314	0.029	0.686
MEDIAN	4.864	1.621	0.499	185.250	186.000	3.550	0.283	0.026	0.717
STD DEVIATION	6.571	3.144	0.929	323.451	327.623	6.827	0.380	0.017	0.380
MINIMUM	0.720	0.000	0.000	26.763	28.000	-9.750	-1.453	0.009	-0.396
MAXIMUM	57.583	27.468	7.630	2289.375	2347.500	58.125	1.396	0.135	2.453

Source: Generated by author

The average estimates of the implied marginal tax rate, estimated using EGR, is 0.314, which indicates that the marginal investor in New Zealand has an implied marginal tax rate equal to 31.4 percent over the sample period. Table 6.1 also shows that the average market price per share is 281.327 cents ($NZ 2.813) on the day before the ex-dividend day. This average drops to 276.484 cents ($NZ 2.765) on the ex-dividend day. The average dividend yield is 2.90 percent, which is calculated as dividend per share divided by the market price per share on the day before the ex-dividend day.

Table 6.2 reports summary statistics of the final sample for the period from 1989 through 1993 (pre-FITC), while Table 6.3 provides summary statistics of the final sample for the period from 1996 through 2000 (post-FITC) for the same variables. The purpose of dividing the final sample into two sub-periods is to examine the tax implication of the FITC on the hypotheses developed in the study. FITC became effective on 5 August 1993 and was extended to foreign portfolio managers on 12 December 1995.

The comparison of the pre- and post- FITC periods indicates the following:

1- The number of firms with complete data available to estimate the implied marginal tax rate is 54 during the period 1989-1993. This number increased to 96 in the period from 1996 through 2000. This change reflects the increase in the number of listed companies on the NZSE[27].

[27] The pre FITC period is defined as the period from 1989 through 1993, while the post FITC period is defined as the period from 1996 through 2000.

Table 6.2

Summary Statistics of the Final Sample for the Period from 1989-1993

DPS are the dividends per share. IPS is the imputation tax credit per share. P_a is the market price per share on the ex-dividend day. P_b is the market price per share the day before ex-dividend day. PDIFF is the change in price or (P_b-P_a). IMTR is the implied marginal tax rate. DY is the dividend yield, and EGR is the Elton and Gruber ratio.

STATISTICS/ VARIABLES	DPS	IPS	P_a	P_b	PDIFF	IMTR	DY	EGR
NO. OF OBS.	55	55	54	54	54	54	54	54
AVERAGE	5.482	1.884	282.236	286.740	4.503	0.376	0.031	0.623
MEDIAN	4.375	1.477	191.500	192.625	2.791	0.430	0.025	0.569
STD DEV	4.969	2.608	435.903	444.614	9.645	0.701	0.030	0.701
MINIMUM	0.675	0.000	30.000	30.000	-7.500	-3.000	0.006	-1.500
MAXIMUM	36.200	17.829	3200.000	3265.000	65.000	2.500	0.233	4.000

Source: Generated by author

Table 6.3

Summary Statistics of the Final Sample for the Period 1996-2000

DPS are the dividends per share; IPS is the imputation tax credit per share. P_a is the market price per share on the ex-dividend day. P_b is the market price per share the day before ex-dividend day. PDIFF is the change in price or (P_b-P_a). IMTR is implied marginal tax rate. DY is the dividend yield, and EGR is the Elton and Gruber ratio.

STATISTICS/ VARIABLES	DPS	IPS	SUPPL	P_a	P_b	PDIFF	IMTR	DY	EGR
NO. OF OBS.	97	96	95	97	97	97	97	97	97
AVERAGE	6.596	2.738	1.011	267.505	272.981	5.476	0.228	0.028	0.772
MEDIAN	4.850	1.970	0.705	195.700	200.400	3.500	0.231	0.025	0.769
STD. DEV.	6.751	3.253	1.404	259.275	264.315	6.231	0.426	0.014	0.426
MINIMUM	0.720	0.000	0.000	26.763	28.000	0.000	-1.692	0.007	0.000
MAXIMUM	58.000	26.166	12.499	1898.000	1940.000	42.000	1.000	0.100	2.692

Source: Generated by author

The comparison of the pre and post FITC periods indicates the following:

2- The average dividends per share increased from 5.4829 for the period ending 1993, to 6.596 for the period from 1996 through 2000, an average increase of 1.113 cents. While this increase may seem to be small, it actually represents a 20.30 percent increase in the average dividends per share, which is statistically significant at the 5 percent level. This is a relatively large increase, given the smaller average market price per share of New Zealand companies ($NZ 2.813), relative to the average market price per share in other markets such as the US ($US 75.00).

3- The average price decline on the ex-dividend day (P_b-P_a) increased from 4.5034 cents before 1993 to 5.476 cents in the post-FITC period. This represents a 21.597 percent increase in the average price decline.

4- The average EGR increases from 0.6233 before 1993, to 0.772 in the post FITC period. This represents an increase of 23.857 percent in the drop off ratio. The difference between the post- and the pre-FITC drop off ratio of 14.87 is statistically significant at one percent level. While these differences may have economic significance, it should be interpreted with caution since it might be due to differences in the sample size and to the quality of New Zealand reported data in the pre-, relative to the post-FITC period. This result is consistent with the notion that the extension of the imputation tax credits benefits to foreign portfolio investors increases the demand for dividends and that FITC brought more neutrality to the imputation system when foreign and domestic investors are treated equally, with regard to imputation credit.

Table 6.4 provides information on the relationship between dividends per share and the change in the price of the stock on the ex-dividend day on an annual basis for all the companies with available data over the period from1989

through 2000. Figure 6.1 graphically depicts this same relationship. The figure indicates that in each year prices drop by less than the amount of dividends. Figure 6.2 shows the relationship between dividend yield and the implied marginal tax rate over the sample period.

Examination of Table 6.4 reveals the following observations about the behaviour of dividends and share prices on the ex-dividend day.

1- The DPS was relatively stable (it ranged from 5.034 to 5.552) over the period from 1989 to 1993. After that period (following the introduction of FITC) the annual average DPS started to increase and it ranged from 6.800 to 8.606 over the period 1994 through 2000. This may be due to the introduction of the FITC in 1993, which allowed foreign investors to receive a supplementary dividend equivalent to the withholding tax they paid.

2- Imputation tax credits start to increase in the beginning of 1993. This behaviour corresponds to dividend increases over the same period. When dividends increase, the imputation tax credit associated with dividends increase as well.

3- The average annual deviation, DEV is positive for each year of the study period. This indicates that stock prices drop by less than the amount of dividends and this behaviour is robust and stable over the period of the study.

TABLE 6.4

Annual Averages of the Dividend Clientele Variables

The relationship between dividends and the change in the price of the stock on the ex-dividend day on an annual basis for all companies with available data for that year. DPS are the average amount of dividends per share. IPS is the average imputation credit per share. SUPPL are the average supplementary dividends per share. Pa is the price on the ex-dividend day. P_b is the average price the day before ex-dividend day. PDIFF is the change in the price defined as P_b minus Pa. DEV is the average difference between DPS minus the price difference PDIFF. IMTR is the average implied marginal tax rate defined as (1-EGR). DY is the dividend yield defined as DPS divided by Pb, and EGR is the average Elton and Gruber ratio defined as PDIFF divided by DPS. NA is not applicable (New Zealand companies started to pay a supplementary dividend after 1993).

YEAR	DPS	IPS	SUPPL	P_a	P_b	PDIFF	DEV	IMTR	DY	EGR
2000	8.202	3.597	1.332	308.648	315.259	6.611	1.591	0.250	0.033	0.750
1999	6.832	2.986	1.144	326.063	331.684	5.620	1.212	0.302	0.028	0.698
1998	6.752	2.933	0.969	249.804	255.047	5.244	1.508	0.337	0.031	0.663
1997	6.800	2.828	1.007	311.026	317.188	6.163	0.637	0.049	0.025	0.951
1996	7.273	3.243	1.171	301.723	307.694	5.971	1.302	0.205	0.025	0.795
1995	6.871	3.014	1.104	286.532	290.929	4.397	2.474	0.311	0.026	0.689
1994	8.606	3.811	1.367	344.491	352.500	8.009	0.597	0.331	0.025	0.669
1993	7.495	3.242	NA	407.547	413.616	6.070	1.425	0.266	0.021	0.734
1992	5.552	2.082	NA	233.368	236.500	3.132	2.420	0.203	0.025	0.797
1991	5.034	1.687	NA	172.274	174.532	2.258	2.776	0.504	0.040	0.496
1990	5.067	1.533	NA	173.629	176.129	2.500	2.567	0.460	0.032	0.540
1989	5.110	1.184	NA	165.343	167.800	2.457	2.653	0.528	0.034	0.472
ALL	6.378	2.412	1.011	276.484	281.327	4.843	1.764	0.314	0.029	0.686

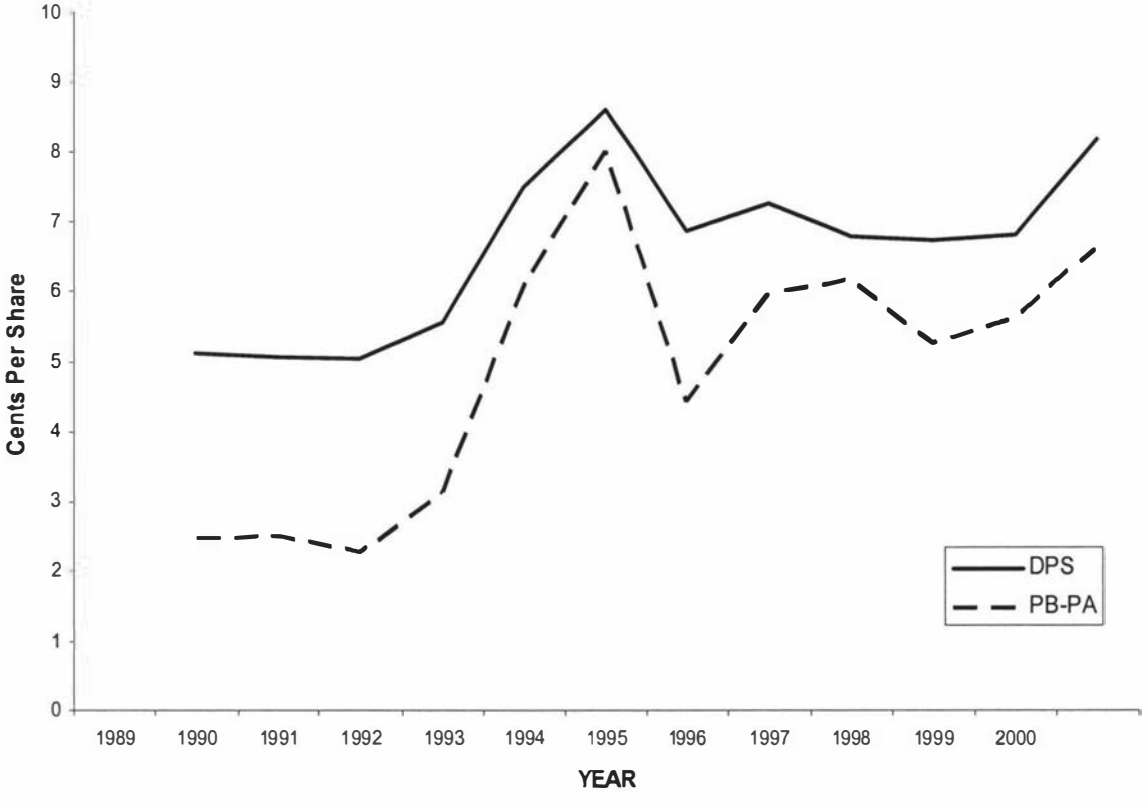
Source: Generated by author

The results in Table 6.4 show that the overall average of dividends per share is 6.378 cents while the overall average price decline on the ex-dividend day is 4.843. It is clear that share prices, on average, drop by less than the amount of dividends paid. The overall average of the drop off ratio (EGR) is 68.6 percent compared to the drop off ratio of 77.7 percent reported by Elton and Gruber (1970) and 85.0 reported by Eades, Hess and Kim (1984) using US data. The overall average deviation (DEV) is 1.764 which indicates that over the period from 1989 to 2000, share prices dropped by less than the amount of dividend on average. It is also important to notice that the average annual deviation is positive for each year between 1989 and 2000. This indicates that the behavior of share prices with regard to dividends on the ex-dividend day is consistent and robust over the study period.

Figure 6.1

Frequency Distribution of Dividend per Share and the Change in Prices

Frequency distribution of dividends per share (DPS) and the change in the market price per share (P_b-P_a) on the ex-dividend day expressed as cents per share over the period from 1989 through 2000.



Source: Generated by author.

Figure 6.2

Frequency Distribution of Dividend Yield and the IMTR

Frequency distribution of dividend yields (right vertical axes) and the implied marginal tax rate IMTR (left vertical axes) over the period from 1989 through 2000.

Source: Generated by author.

These results suggest that the behaviour of share prices on the ex-dividend day is not due to tax differentials between the effective tax rate on ordinary income and the effective tax rate on capital gains. Under the New Zealand tax regime, where individual investors (in comparison to the classical tax system) are indifferent between receiving their income in the form of dividends or in the form of capital gains, the drop off ratio is similar in its direction and magnitude to what has been reported by other studies using company data which fall under the classical tax system. In addition, the results indicate that both the drop off ratio and DPS increased in the post FITC period. This result suggests that the introduction of FITC brought the imputation tax system closer to neutrality for

investors in terms of receiving their income in the form of dividends or capital gains. The fact that share prices drop by less than the amount of the dividend, indicate that the results are not driven by tax arguments and warrants further analysis of other explanations. This issue is explored in more detail later in this chapter.

In summary, the results indicate that share prices drop by less than the amount of the dividend on the ex-dividend day. The average drop off ratio is 68.60 percent for the whole period. In addition, the drop off ratio increased from 62.30 percent in the pre-FITC to 77.20 percent in the post-FITC period. The implications of this finding are described below.

1) The behaviour of share prices on the ex-dividend day is not due to tax differential between dividend and capital gains since under the New Zealand tax regime such a distinction does not exist.
2) Share price behaviour on the ex-dividend day is not due to discreteness and tick size as in New Zealand both share prices and dividends per share are reported on the same basis.
3) The introduction of FITC increases the demand and the valuation of dividends and brings more neutrality to the imputation system when foreign and domestic investors are treated equally with regard to the imputation credit.

6.1.2 Results of Dividend Clientele Tests over the Entire Period 1989-2000

Table 6.5 reports the results of tests for dividend clienteles and the relationship between dividend yield and estimates of the implied marginal tax rate. The data is divided into three categories based on dividend yield. The first category includes companies with the lowest dividend yield and the third category includes companies with the highest dividend yield.

The dividend clientele argument suggests that if individual investors specialize their holding according to dividend yields, then individuals in high tax brackets

should hold the stocks of firms with low dividend yields, while investors in low tax brackets hold the stock of companies with high dividend yields. This implies a negative relationship between the dividend yield and the implied marginal tax rate.

Table 6.5 reports the results of the tests for a relationship between dividend yield and the IMTR. The correlation coefficient between dividend yields and the implied marginal tax rate is a negative (–0.0936) as anticipated, with a t-statistic of 0.3470. This is not statistically significant using conventional cut-off levels. The results in Table 6.5 regarding correlations provide no support to Hypothesis 1 that the relationship between dividend yield and the individual implied marginal tax rate is negative and statistically significant. These results are consistent with those of Miller and Scholes (1982), Kalay (1982a) and Beveridge, Bauer and Sivakumar (2002).

Another implication of the dividend clientele theory is that the distribution of dividend yields is expected to resemble a *bimodal* distribution with one mode close to zero and the other centred at some high level.

Table 6.5 shows that the distribution of dividend yields, with regard to the IMTR, does not resemble a bimodal distribution. The first category with the lowest average dividend yield of 1.77 percent is associated with an IMTR of 34.37 percent. The third category, with the highest dividend yield of 4.41 percent, is associated with an IMTR of 31.59 percent. The difference between the two means of the IMTR is 2.78 percent, which is not statistically significant at the 5 percent level.

Table 6.5

Dividend Clienteles Split into Three Categories for the Period 1989-2000

The relationship between dividend yield and estimates of investors' implied marginal tax rates. N is the number of observation in each category. DY is the average dividend yield. IMTR is the estimate of the investors' implied marginal tax rate. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are the dividend per share. Mean is the average of the Elton and Gruber ratio. Median is the median of the ratio. STD is the standard deviation. Min is the minimum value. Max is the maximum value. Corr is the correlation coefficient between dividend yield and the Elton and Gruber ratio.

Category	N	DY Mean	IMTR Mean	$(P_b - P_a)/DPS$				
				Mean	Median	STD	Min.	Max.
1	35	0.0177	0.3437	0.6563	0.6570	0.4226	-0.3960	2.4530
2	33	0.0281	0.2760	0.7240	0.2826	0.2100	1.2750	1.2750
3	35	0.0441	0.3159	0.6841	0.7670	0.3394	0.0000	1.1980
All	103	0.0294	0.3139	0.6860	0.7170	0.3796	-0.3960	2.4530

Source: Generated by author

Table 6.6

Dividend Clienteles Split into Five Categories for the Period 1989-2000

The relationship between dividend yield ratio and estimates of investors' implied marginal tax rates. N is the number of observation in each category. DY is the average dividend Yield. IMTR is the estimates of the investors' implied marginal tax. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are the dividend per share. Mean is the average of the Elton and Gruber ratio. Median is the median of the ratio. STD is the standard deviation. Min is the minimum value. Max is the maximum value. Corr is the correlation coefficient between dividend yield and the Elton and Gruber ratio.

Category	N	DY Mean	IMTR Mean	$(P_b - P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	21	0.0157	0.4467	0.5533	0.5740	0.4226	-0.3960	1.3140
2	20	0.0214	0.2455	0.7546	0.6955	0.5063	0.1000	2.4530
3	21	0.0262	0.2112	0.7888	0.7510	0.2196	0.2800	1.2750
4	20	0.0318	0.3027	0.6973	0.7490	0.2801	0.2530	1.1980
5	21	0.0518	0.3601	0.6399	0.6210	0.3646	0.0000	1.1860
All	103	0.0294	0.3139	0.6860	0.7170	0.3796	-0.3960	2.4530

Source: Generated by author [28]

The relationship between dividend yield and the implied marginal tax rate, the data is divided into five categories as shown in Table 6.6. This allows consideration of the categories with the highest and lowest dividend yields, and

[28] The data were also classified on the basis of seven categories. The results are similar to those of three and five categories and are available upon request.

their associated IMTR, to ensure that differences in the marginal tax rate are not due to values which fall in the middle.

Table 6.6 does not show a bimodal distribution. The first category with the lowest average dividend yield of 1.57 percent corresponds to the highest IMTR of 44.67 percent. However, the IMTR starts to decline in the middle before increasing to 36.01 percent for the last category with the highest dividend yield. When the data is sorted into seven categories (the table is available from the author upon request) the results show similar behaviour. The first category with an average dividend yield of 1.45 percent is associated with an IMTR of 44.08 percent while the last category, with a dividend yield of 5.72 percent, is associated with an IMTR of 40.52 percent. The difference between the highest IMTR of 44.08 percent and the lowest IMTR of 40.52 percent is 3.56 percent. The t-statistic for the difference between two means is 0.920. This difference is not statistically significant at the 5 percent level.

Figure 6.3 shows the frequency distribution of dividend yields over the sample period. Figure 6.4 and 6.5 show the frequency distribution of dividend yields for the pre- and post- FITC periods, respectively. None of the figures indicate that the behaviour of dividend yields is consistent with a bimodal distribution.

6.1.3 Results of Tests for Dividend Clienteles pre- and post-FITC

The New Zealand government introduced the FITC system on 5 August 1993, which allows foreign investor's access to the imputation credit, with the exception of foreign portfolio investors with 10 percent or more ownership in a New Zealand resident company. Before 1993, non-resident shareholders or foreign investors were unable to participate in the imputation tax credit or to make use of the imputation system; foreign investors were taxed as if they were under a classical tax system[29].

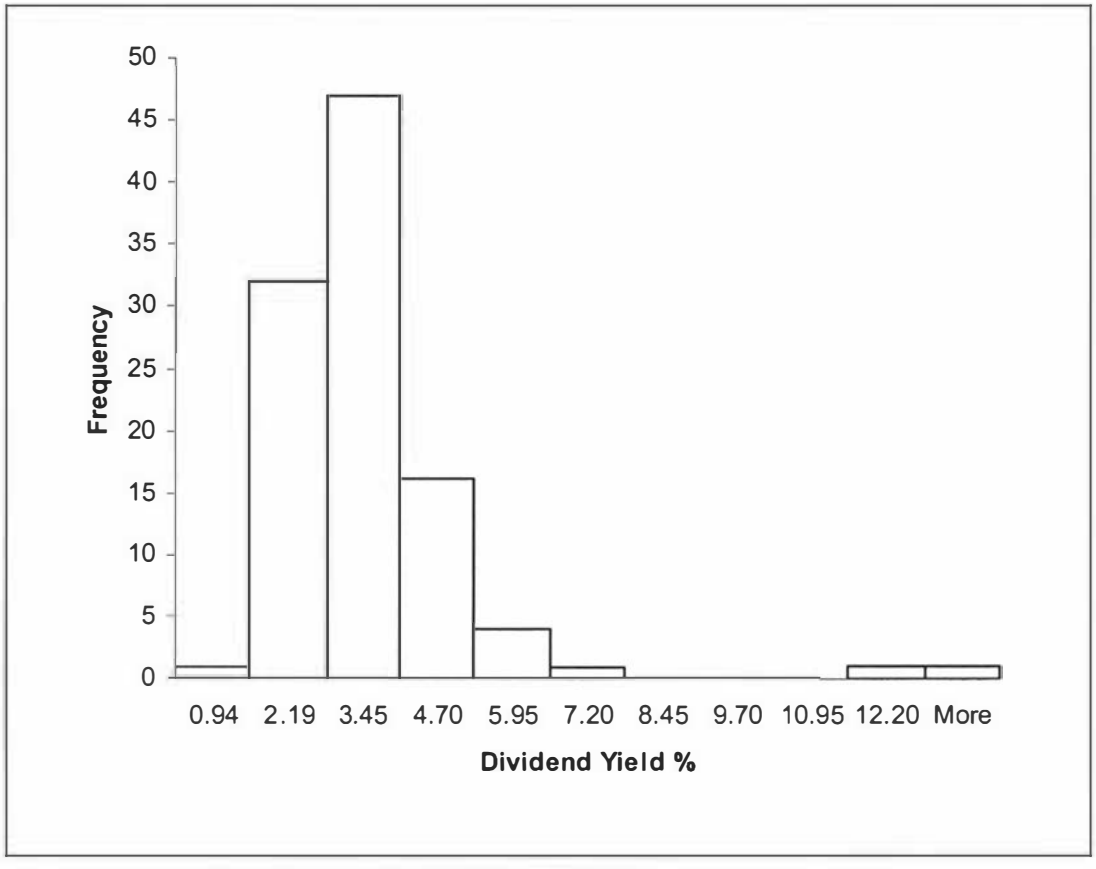
[29] Head (1992) and Smith (1995) argue that the denial of the advantages of imputation to non-resident and foreign investors tended to discourage foreign investments

On 12 December 1995 the FITC was modified and the benefits of the imputation were extended to all investors. The introduction of FITC increased the after tax cash flows to foreign investors by the amount of the supplementary dividend. In addition, it increased the demand for, and the valuation of, dividends in the post, relative to the pre-FITC period (where foreign investors are taxed as if they were under a classical tax regime). Thus if tax induced dividend clienteles exist, it should be more obvious, and more observable, in the pre- relative to the post-FITC period. The introduction of FITC eliminates the differential tax treatment between domestic and foreign investors and brought the imputation tax regime closer to neutrality for investors in their choice between dividends versus capital gains. Thus, one would anticipate the absence of dividend clientele in the post-relative to the pre-FITC period.

To examine this proposition the sample is divided into two groups; the first group is post-FITC, which covers the period from 1996 to 2000. The second group is pre-FITC and it covers the period from 1989 to 1993. For each group the data are sorted into three, five, and seven (available from author upon request) categories based on dividend yield level and the estimate of the implied marginal tax rate.

Figure 6.3

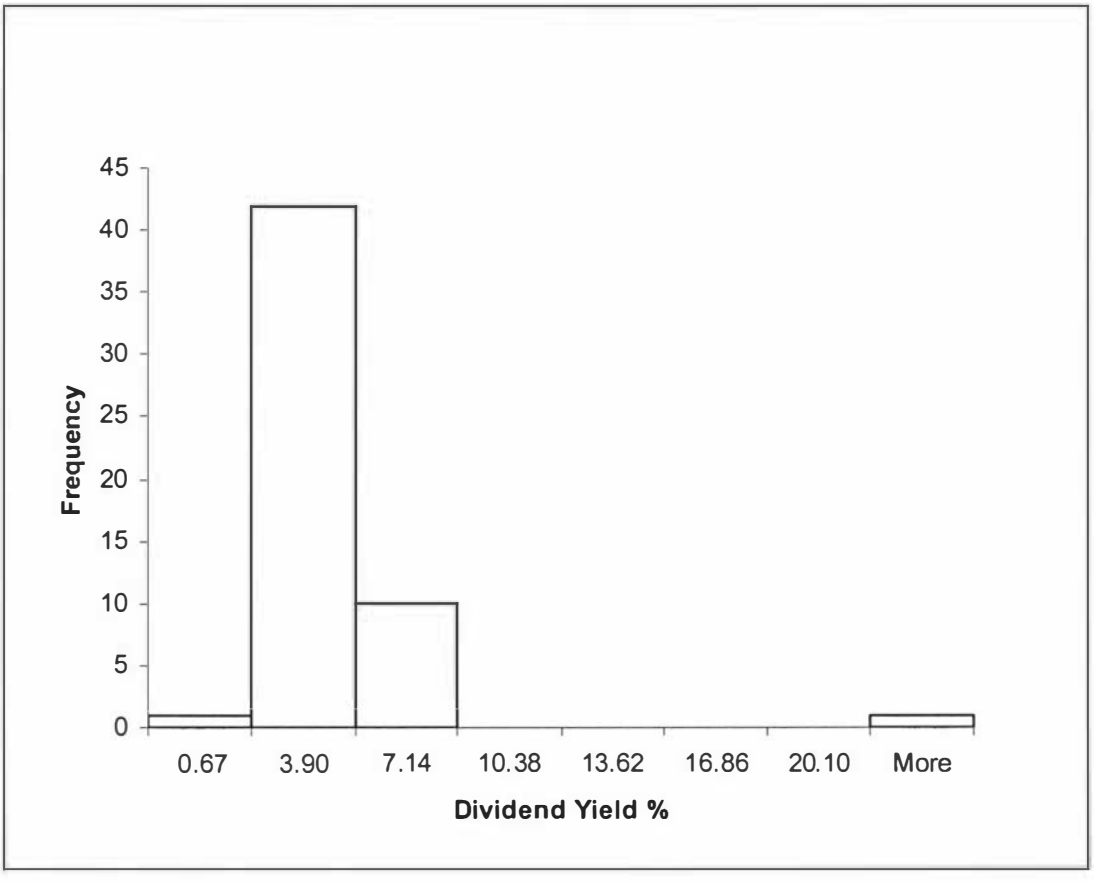
Frequency Distribution of Dividend Yield over the Period 1989-2000



Source: Generated by author.

Figure 6.4

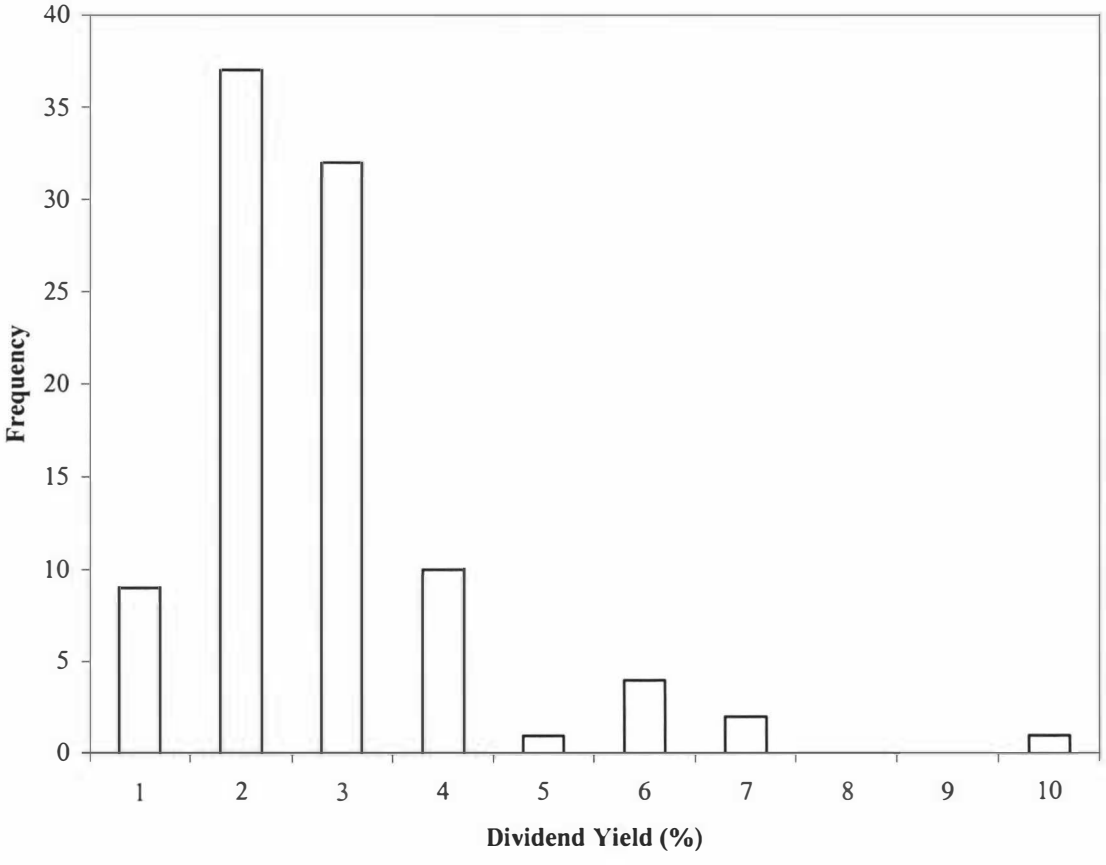
Frequency Distribution of Dividend Yield over the Period 1989-1993



Source: Generated by author.

Figure 6.5

Frequency Distribution of Dividend Yield 1996-2000



Source: Generated by author

Table 6.7

Dividend Clienteles Split into Three Categories for the Period 1996-2000

This table depicts the relationship between dividend yield and estimates of investors' personal implied marginal tax rates. N is the number of observations in each category. DY is the average dividend yield. IMTR is the estimate of the investors' implied marginal tax rate. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are the dividend per share. Mean is the average of the Elton and Gruber ratio. Median is the median of the ratio. STD is the standard deviation. Min is the minimum value. Max is the maximum value, and Corr. is the correlation coefficient between the dividend yield and the Elton and Gruber ratio.

Category	N	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	32	0.0168	0.2749	0.7251	0.7000	0.4014	0.0000	1.4203
2	32	0.0256	0.2452	0.7548	0.6943	0.5320	0.0000	2.6923
3	32	0.0427	0.1654	0.8346	0.8771	0.3342	0.0000	1.5000
All	96	0.0284	0.2285	0.7715	0.7571	0.4284	0.0000	2.6923

Correlation between the dividend yield and the IMTR is –0.0270 with a P-value of 0.5264.

Source: Generated by author

Table 6.7 reports the results of splitting the dividend clienteles into three groups for the post-FITC period. The correlation coefficient of –0.0270 between dividend yield and the IMTR is negative as anticipated, but it is not statistically significant at the five percent level (level of significance is 0.5264). Visual inspection of the table indicates that there is some evidence of dividend clientele. The first category with the lowest average dividend yield of 1.680 percent is associated with an IMTR of 27.49 percent, while the third category with the highest dividend yield of 4.27 percent corresponds to an IMTR of 16.54 percent. The difference between the two means IMTR is 13.03 percent with a t-statistic of 1.448, which is not statistically significant at the five percent level.

Table 6.8

Dividend Clientele Split into Five Categories for the Period 1996-2000

This table depicts the relationship between dividend yield and estimates of investors' personal implied marginal tax rates. N is the number of observations in each category. DY is the average dividend yield. IMTR is the estimate of the investors' implied marginal tax rate. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are the dividends per share. Mean is the average of the Elton and Gruber ratio. Median is the median of the ratio. STD is the standard deviation. Min is the minimum value. Max is the maximum value. Corr. is the correlation coefficient between the dividend yield and the Elton and Gruber ratio.

Category	N	DY Mean	IMTR Mean	(Pb-Pa)/DPS				
				Mean	Median	STD	Min	Max
1	19	0.0147	0.2607	0.7393	0.8125	0.4192	0.0000	1.3981
2	19	0.0206	0.1612	0.8388	0.6986	0.5715	0.1176	2.6923
3	20	0.0256	0.2999	0.7001	0.6749	0.4550	0.0000	1.6806
4	19	0.0311	0.2404	0.7596	0.7241	0.2908	0.0000	1.2701
5	19	0.0500	0.1765	0.8235	0.8866	0.3857	0.0000	1.5000
All	96	0.0284	0.2285	0.7715	0.7618	0.4284	0.0000	2.6923

Source: Generated by author[30]

Table 6.8 provides the same conclusions as those from Table 6.7. It shows that the first category with the lowest dividend yield of 1.47 percent is associated with an IMTR of 26.07 percent while the last category with the highest dividend yield of 5.00 percent is associated with an IMTR of 17.65 percent; the difference between the two categories IMTR is 8.42 percent, but the t-statistic of 0.875 for the difference between the two means of IMTR is not statistically significant at the five percent level. These results do not support the dividend clientele arguments and it does not show that the behaviour of dividend yield resembles a bimodal distribution as expected by the dividend clientele hypothesis.

Table 6.9 reports the results of dividend clientele tests for the pre-FITC period (1989-1993) where the sample is sorted into three categories on the basis of dividend yields. The correlation coefficient between the dividend yield and the IMTR is positive (0.1821) but it is not statistically significant at conventional

[30] The data were classified on the basis of seven categories and the results are similar to those of three and five categories. The table is available upon request.

levels (the P-value is 0.1875). Both the direction and the level of significance are not consistent with the dividend clientele prediction of a negative and statistically significant relationship between dividend yield and the IMTR. Table 6.9 shows that the first category with the lowest dividend yield of 1.66 percent is associated with an IMTR of 19.50 percent, while the last category with the highest dividend yield of 5.12 percent corresponds to an IMTR of 47.63 percent. These results are contrary to the expectations of dividend clientele hypothesis, though the results are not statistically significant, and show no evidence that the distribution of dividend yields resembles a bimodal distribution. This conclusion is also supported by Figure 6.4, which depicts a frequency distribution of dividend yields.

Table 6.9

Dividend Clienteles Split into Three Categories for the Period 1989-1993

This table depicts the relationship between dividend yield ratio and estimates of investor's personal implied marginal tax rates. N is the number of observations in each category. DY is the average dividend yield. IMTR is the estimate of the investors' implied marginal tax rate. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are the dividends per share. Mean is the average of the Elton and Gruber ratio, Median is the median of the ratio. STD is the standard deviation. Min is the minimum value. Max is the maximum value, and Corr is the correlation coefficient between the dividend yield and the Elton and Gruber ratio.

Category	N	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	18	0.0166	0.1950	0.8050	0.5116	0.9347	0.0000	4.0000
2	18	0.0259	0.4588	0.5412	0.8387	0.6042	-1.5000	1.3583
3	18	0.0512	0.4763	0.5237	0.4971	0.4924	0.0000	1.7857
All	54	0.0312	0.3767	0.6233	0.5697	0.7014	-1.5000	4.0000

Correlation between dividend yield and IMTR is 0.1821 (0.1875)

Source: Generated by author

Table 6.10 reports the relationship between dividend yields and the IMTR where the data is sorted into five categories based on dividends for the pre-FITC period. The results point to the same conclusions reached from Table 6.9. It shows that the first category with the lowest dividend yield 1.39 percent corresponds to an IMTR of –0.87 percent. The IMTR reaches 59.99 percent in the third category, and then drops to 48.63 percent for the last category. This

behaviour does not support a bimodal distribution and it is not consistent with the dividend clientele argument.

Table 6.10

Dividend Clienteles Split into Five Categories for the Period 1989-1993

This table depicts the relationship between dividend yield ratio and estimate of investors' personal implied marginal tax rates. N is the number of observations in each category. DY is the average dividend yield. IMTR is the estimate of the investors' implied marginal tax rate. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are the dividends per share. Mean is the average of the Elton and Gruber ratio. Median is the Median of the ratio. STD is the standard deviation. Min is the minimum value. Max is the maximum value, and Corr is the correlation coefficient between the dividend yield and the Elton and Gruber ratio.

Category	N	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	11	0.0139	-0.0087	1.0087	0.9458	1.1652	0.0000	4.0000
2	11	0.0215	0.4305	0.5695	0.5000	0.3254	0.2238	1.3583
3	10	0.0251	0.5999	0.4002	0.7539	0.7358	-1.5000	0.9692
4	11	0.0338	0.3958	0.6535	0.4896	0.4896	0.0000	1.7857
5	11	0.0612	0.4863	0.5137	0.5660	0.4321	0.0000	1.2016
All	54	0.0312	0.3767	0.6233	0.5697	0.7014	-1.5000	4.0000

Source: Generated by author[31]

6.1.4 Summary of the Dividend Clientele Results

This section examines the behaviour of share prices on the ex-dividend day and tests for the relationship between dividend yield and the estimates of the individual investor's implied marginal tax rate. The results are reported for the entire sample and for the period before and after the foreign investor's tax credit of 1993. The results reveal that share prices drop by less than the amount of dividend on the ex-dividend day; the average drop off ratio is 68.6 percent. These results are similar to previous studies, such as Elton and Gruber (1970), Poterba (1986) and Beveridge, Bauer and Sivakumar (2002), which utilized data for companies operating under the classical tax system. The implication is that tax differentials between capital gains and ordinary income is not a valid explanation of why share prices drop by less than the amount of the dividend on

[31] The data were classified on the basis of seven categories and the results are similar to those of three and five categories. The table is available upon request.

the ex-dividend day. Even under the New Zealand imputation system where individual investors are to large extent indifferent between dividends and capital gains, prices still drop by less than the amount of dividends on the ex-dividend day.

The results also show that the correlation coefficient between dividend yield and the implied marginal tax rate is generally negative, as anticipated, but it is not statistically significant. There is no compelling evidence that the distribution of dividend yield resembles a bimodal distribution, where individuals in high tax brackets are attracted to companies with low dividend yields and vice versa. The results show weak and not statistically significant dividend clientele behaviour in the post-FITC period.

The results show that the average drop off ratio increased from 62.30 percent in the pre-FITC, to 77.20 percent in the post FITC period. This suggests that the introduction of FITC, which allows foreign investors to participate in the imputation credit, reduces the differential tax treatments between foreign and domestic shareholders and brings the imputation tax regime closer to neutrality as the drop off ratio increases significantly in the post FITC period.

In order to examine whether the results were influenced by a survival bias and the inclusion of small firms (especially over the period 1996-2000), the analysis of dividend clientele is repeated for a sample of survival firms (companies existed during the period 1989-1993 and continue to exist during the period 1996-2000), there are 45 firms existed in both periods. Appendix I report the results of dividend clientele for the survived companied for the period 1989-1993 Panel A, and for the post FITC period 1996-2000 Panel B where the sample is divided into three categories. Appendix J report the same results where the sample is divided into three five categories. The results are similar to those reported for the entire sample which suggests that the results of this study with regard to dividend clientele are not driven by survival bias.

In general, these results do not lend support to the dividend clientele hypothesis under the New Zealand imputation tax regime.

6.2 Results for Financial Leverage Clienteles

The presence of financial leverage clientele implies that if individual investors specialize their portfolios according to the leverage policies of a firm, then one would expect to find a negative correlation between corporate leverage and shareholders' implied tax rates. In other words, companies following low leverage policies will attract a clientele of investors in high tax brackets and firms following high leverage policies will attract shareholders in low tax brackets. The second implication is that corporate leverage ratios follow a bimodal distribution with one mode centred at zero and the other centred around some high level, which is theoretically unspecified.

6.2.1 Results for Leverage Clienteles using LEV1

Table 6.11 Panel A reports the results for financial leverage clienteles over the period of 1989-2000, while Panels B and C report the results for the post- and pre-FITC periods respectively. Leverage (LEV1) is defined as the book value of long-term debt divided by the book value of long-term debt plus market value of equity. The data is sorted (from the lowest to the highest) on the basis of LEV1 into five categories, where the first category represents the lowest degree of financial leverage. The results show that the correlation coefficient between financial leverage and the implied marginal tax rate is negative (-0.058), as anticipated, but not statistically significant at the five percent level. The first category, with the lowest degree of financial leverage of 4.90 percent, is associated with an IMTR of 40.40 percent. The last category, with the highest degree of financial leverage of 57.90 percent, corresponds to an IMTR of 35.10 percent. The mean difference between the two mean IMTR is 5.30 percent with a t-statistic of 0.588, which is not statistically significant at the five percent level.

To examine the effect of FITC and its tax implication for leverage clienteles, the sample is divided into two groups. Panel B (post-FITC) indicates that the highest IMTR of 35.26 percent corresponds to the third category of financial leverage 30.09 percent. While the lowest IMTR of 13.07 percent corresponds to the second category of financial leverage of 20.95 percent. In addition, the behavior of financial leverage does not resemble a bimodal distribution as predicted. These results are not consistent with the leverage clientele hypothesis

Panel C of Table 6.11 reports the results for financial leverage clienteles for the pre-FITC period and contrary to expectations there is a positive correlation of 0.063, although it is not statistically significant, between financial leverage and the IMTR. In addition the behaviour of financial leverage clienteles is not consistent with a bimodal distribution. (Appendix F report similar results when the sample is divided into three categories)

Table 6.11

Leverage Clienteles (LEV1) Split into Five Categories

This table depicts the relationship between leverage and estimates of investors' personal implied marginal tax rates. N is the number of observations in each category. LEV1 is the book value of long-term debt divided by book value of long-term debt plus equity. IMTR is the estimate of the investors' implied marginal tax rate. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are dividends per share. Mean is the average of the Elton and Gruber ratio. Median is the median of the ratio. STD is the standard deviation. Min is the minimum value, and Max is the maximum value.

Panel A: 1989-2000

Category	N	LEV1 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	20	0.049	0.404	0.596	0.685	0.376	0.000	1.314
2	20	0.211	0.175	0.825	0.807	0.471	0.202	2.453
3	19	0.311	0.365	0.635	0.664	0.239	0.099	1.055
4	20	0.396	0.257	0.743	0.803	0.328	-0.166	1.275
5	20	0.579	0.351	0.649	0.749	0.431	-0.396	1.259
All	99	0.306	0.309	0.691	0.717	0.380	-0.396	2.453

Panel B: 1996-2000

Category	N	LEV1 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	19	0.0290	0.2811	0.7189	0.7623	0.4356	0.0000	1.4203
2	19	0.2095	0.1307	0.8693	0.7448	0.5453	0.1176	2.6923
3	18	0.3009	0.3526	0.6474	0.6976	0.2968	0.0980	1.3333
4	19	0.4058	0.2267	0.7733	0.8125	0.4000	0.0000	1.6806
5	19	0.5558	0.1564	0.8436	0.8866	0.4237	0.0000	1.5000
All	94	0.3002	0.2285	0.7715	0.7808	0.4284	0.0000	2.6923

Panel C: 1989-1993

Category	N	LEV1 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	10	0.035	0.096	0.904	0.601	0.866	0.000	2.848
2	9	0.179	0.067	0.933	0.898	0.470	0.000	1.682
3	10	0.339	0.590	0.410	0.357	0.388	0.000	1.045
4	9	0.439	0.651	0.349	0.292	0.301	0.000	0.744
5	10	0.581	0.086	0.914	0.639	0.499	0.506	1.796
All	48	0.314	0.289	0.711	0.639	0.588	0.000	2.848

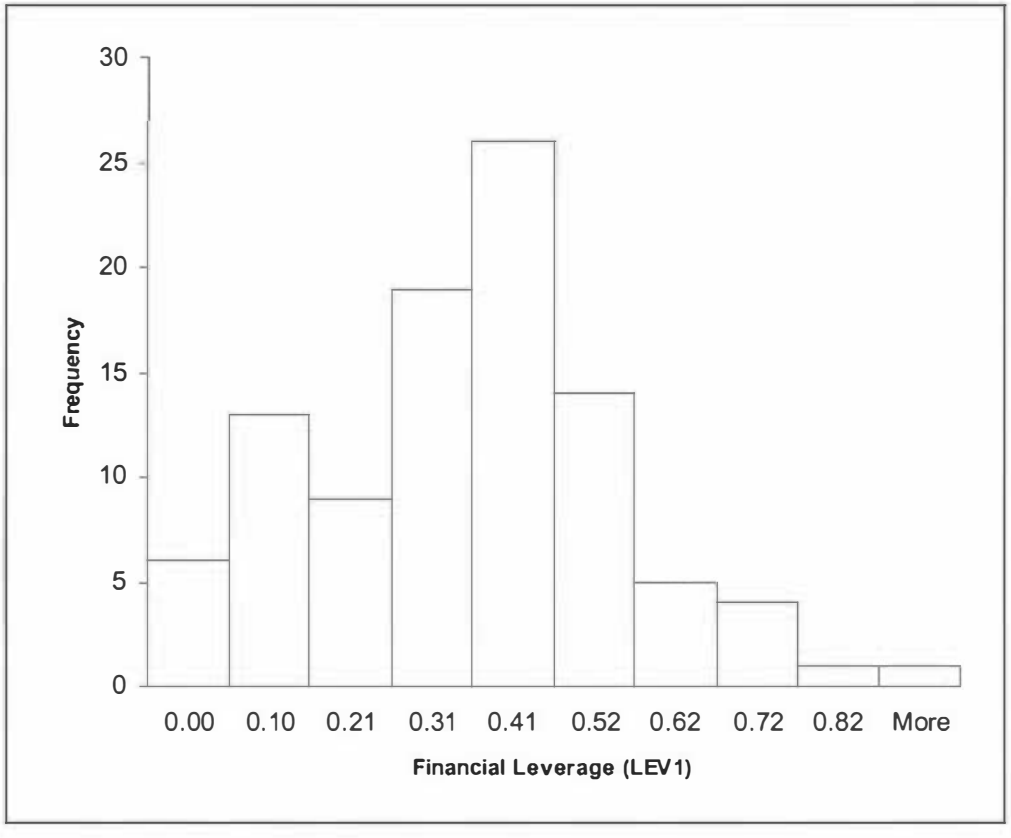
Source: Generated by author

Figure 6.6 depicts the frequency distribution of the financial leverage (LEV1) variable and it shows that financial leverage does not behave in a bimodal distribution fashion. The lack of bimodal distribution behaviour, the insignificant correlation between financial leverage clienteles and the IMTR,

and the insignificant t-statistics of the difference between the two IMTR means leads to rejection of the financial leverage clienteles hypothesis[32].

Figure 6.6

Frequency Distribution of Financial Leverage (LEV1)



Source: Generated by author

6.2.2 Results of Leverage Clientele with LEV2

To examine the possibility that the results were influenced by the method of measuring financial leverage, two additional definitions of financial leverage are used. Table 6.12 reports the results of the relationship between financial

[32] The analysis was performed on the basis of three categories of financial leverage (LEV1) with the same results. These results are reported in Appendix G.

leverage and the IMTR for the whole period, Panel A, and for the post- and pre-FITC period, in Panel B, and C, respectively, where financial leverage (LEV2) is defined as the book value of total liabilities divided by the book value of total assets. LEV1 and LEV2 are defined in the same way as Harris, Roenfeldt and Cooley (1983) to make it easy to compare the results of this study to theirs. LEV1 incorporates the market value of equity, which reflects the risk and return characteristics of the firm and the value of intangible assets. LEV2 reflects the historical cost of the assets, thus it may be inferior to LEV1 in some respects.

Panel A of Table 6.12 shows that the first category with the lowest degree of financial leverage of 13.40 percent is associated with an IMTR of 37.60 percent. The last category with the highest degree of financial leverage of 62.50 percent is associated with an IMTR of 19.90 percent. In addition, the highest IMTR of 40.20 percent corresponds to the second category of financial leverage. The correlation coefficient between financial leverage and the IMTR is negative (–0.140), but it is not statistically significant. These results are not consistent with the financial leverage clienteles hypothesis. A comparison of financial leverage clienteles for the pre- and post-FITC produce the same results. Figure 6.7 is a frequency distribution of financial leverage (LEV2), and it shows that the behaviour of the financial leverage is not consistent with a bimodal distribution.

Thus the results in Table 6.12 for the whole period, and for pre- and post-FITC periods indicate the absence of leverage clienteles. The correlation between financial leverage and IMTR is not significant and the distribution of financial leverage does not resemble a bimodal distribution. Thus, these results do not provide support for the financial leverage clientele hypothesis. (Appendix G report similar results when the sample is divided into three categories).

Table 6.12

Leverage Clienteles (LEV2) Split into Five Categories

This table depicts the relationship between Leverage and estimates of investors' personal implied marginal tax rates. N is the number of observations in each category. LEV2 is the book value of total liabilities divided by the book value of total assets. IMTR is the estimate of the investors' implied marginal tax rate. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are dividends per share. Mean is the average of the Elton and Gruber ratio, Median is the median of the ratio. STD is the standard deviation. Min is the minimum value. Max is the maximum value, and Corr is the correlation coefficient between the LEV2 and the Elton and Gruber ratio.

Panel A: 1989-2000

Category	N	LEV2 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min.	Max.
1	20	0.134	0.376	0.624	0.759	0.367	0.000	1.133
2	20	0.267	0.402	0.597	0.601	0.274	0.000	1.033
3	19	0.353	0.278	0.722	0.757	0.342	-0.167	1.275
4	20	0.438	0.314	0.686	0.661	0.314	0.000	1.341
5	20	0.625	0.177	0.823	0.837	0.540	-0.392	2.453
All	99	0.364	0.314	0.686	0.717	0.380	-0.392	2.453

Panel B: 1996-2000

Category	N	LEV2 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min.	Max.
1	19	0.0890	0.2742	0.7258	0.7014	0.4290	0.000	1.4203
2	19	0.2402	0.2791	0.7209	0.6956	0.3130	0.0980	1.3023
3	19	0.3266	0.3423	0.6577	0.7493	0.3016	0.0000	1.0465
4	19	0.4674	0.0472	0.9528	0.8676	0.6204	0.1176	2.6923
5	19	0.6025	0.1740	0.8259	0.8866	0.3756	0.0000	1.4217
All	95	0.3330	0.2285	0.7715	0.7690	0.4284	0.000	2.6923

Panel C: 1989-1993

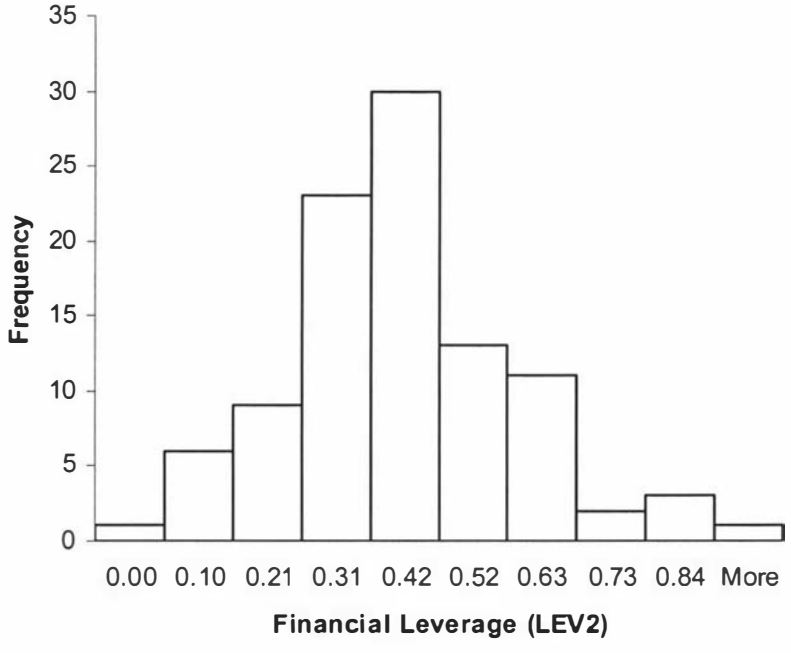
Category	N	LEV2 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min.	Max.
1	10	0.198	0.084	0.916	0.864	0.897	0.000	2.848
2	9	0.371	0.247	0.753	0.676	0.455	0.000	1.682
3	10	0.481	0.365	0.635	0.450	0.520	0.125	1.732
4	9	0.586	0.604	0.396	0.512	0.336	0.000	0.857
5	10	0.718	0.161	0.839	0.640	0.518	0.137	1.796
All	48	0.471	0.289	0.711	0.639	0.588	0.000	2.848

Source: Generated by author[33]

[33] The data were classified on the basis of seven categories and the results are similar to those of three and five categories. The table is available upon request.

Figure 6.7

Frequency Distribution of Financial Leverage (LEV2)



Source: Generated by author

Appendix K reports the results of the survived companies for the pre FITC period 1989-1993 and post FITC period 1996-2000 on the basis of three categories for LEV1 while Appendix L report the same results on the basis of five categories. The results of financial leverage clienteles resemble those reported for the entire sample which suggests that the results are not driven by survival bias or by the inclusion of small firms in the subsequent period of the study. Similar results are reported in appendix M and N for LEV2.

6.2.3 Summary of the Tests for Financial Leverage Clienteles

This section tests for the financial leverage clienteles hypothesis where individuals in higher tax brackets may be attracted to companies with a lower degree of financial leverage. The relationship between financial leverage and the IMTR is examined using two different measures of financial leverage. Both measures of financial leverage clientele produce consistent results regardless of whether the data is segmented on the basis of three, five or seven (available from author upon request) categories. This indicates that the results are not influenced by how financial leverage is calculated. The results indicate that the correlation coefficient between financial leverage and the individual investor's implied marginal tax rate is negative, as expected, but it is not statistically significant. The behaviour of the financial leverage in relation to the IMTR does not exhibit the predicted bimodal distribution. Thus, the absence of a bimodal behaviour of the financial leverage, and the insignificant correlation between financial leverage and the IMTR leads to the rejection of the hypothesis that corporate financial leverage ratios follow a bimodal distribution, which does not lend support to the financial leverage clientele argument[34].

In addition, the results indicate that the introduction of FITC does not influence the results. This may be due to the fact that the main emphasis of the FITC is to eliminate restrictions imposed on foreign investors in terms of their participation in the benefit of the dividend imputation tax credit. It may not directly influence the financial leverage of the firm, although a linkage between the two is acknowledged.

6.3 Results of Tests for the Joint Clienteles Hypothesis

The joint clienteles hypothesis implies that individual investors in high tax brackets should seek stocks of firms with low dividend yield and a low degree of financial leverage. Conversely, investors subject to low tax rates should seek

[34] The analysis of the financial leverage clientele was performed on the basis of three categories with same results as those reported for five categories. These results are reported in Appendix H.

stocks of firms with a high dividend yield and a high degree of financial leverage. Table 6.13 reports the test results of the joint clienteles hypothesis and the estimates of the implied marginal tax rate for all possible combinations of dividend yield and leverage as predicted by the joint clienteles hypothesis for the pre- and post-FITC periods. Financial leverage LEV1 is employed as the leverage measure in this analysis.

The results of Table 6.13, Panel A, show that the post-FITC results for the first category of companies with a low dividend yield (mean equals 2.0 percent), and low leverage (mean equals 17.30 percent) is associated with an IMTR of 20.50 percent. The second category of firms with a high dividend yield (averaging 3.40 percent) and a high degree of financial leverage (45.40 percent mean) correspond to an IMTR of 19.90 percent. The mean difference between the two categories' marginal tax rates is 0.60 percent, which is not statistically significant at any conventional level. This indicates that the two groups of firms have insignificantly different individual marginal tax rate estimates. These results are not consistent with the joint clienteles argument.

The third category of companies with low divided yield (mean equal to1.90 percent) and high leverage (mean of 44.80 percent) have an IMTR of 18.50 percent. This estimate of the marginal tax rate is not significantly different from the IMTR in category 4 for companies with a high dividend yield (average of 4.10 percent) and low leverage (13.80 percent mean). In addition, the mean difference in the IMTR between any two categories is not statistically significant. This suggests that there is nothing unique about the clientele of investors in the first and second categories. Other categories with different combinations of financial leverage and dividend yield produce similar estimates of the IMTR. These results are not consistent with the implications of the joint clienteles hypothesis.

Table 6.13, Panel B reports the pre-FITC results and shows that for the first category of firms with low dividend yield-low leverage, the IMTR is 3.10 percent. For the second category of firms with high dividend yield-high leverage, the IMTR is 41.30 percent. These results are contrary to the joint clientele prediction of a negative relationship between dividend yield and leverage and the IMTR. The third and the fourth category in Panel B have almost the same estimates of the IMTR of 33.90, and 37.90 percent, respectively. These estimates are not statistically significant from the IMTR estimate in the second category, and are not consistent with the joint clienteles hypothesis.

Table 6.13

Statistics for Joint Clienteles with Different Dividend Yield-Leverage (LEV1) Combinations

Estimates of the implied marginal tax rate (IMTR) for different combinations of dividend yield and leverage as predicted by the joint clienteles hypothesis. LEV1 is measured as long-term debt divided by long-term capital. N is the number of observations in each group. DY is the average dividend yield for each group. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are dividends per share. EGR is the average Elton and Gruber ratio. STD is the standard deviation of EGR. MIN and MAX is the minimum and the maximum values of EGR respectively.

Panel A: 1996-2000

DIVIDEND YIELD	LEVERAGE	N	LEV1 Mean	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
						MEAN	MED	STD	MIN	MAX
1.Low Dividend Yield	Low Leverage	24	0.173	0.020	0.205	0.795	0.723	0.568	0.118	2.693
2.High Dividend Yield	High Leverage	24	0.454	0.034	0.199	0.801	0.777	0.383	0.000	1.500
3.Low Dividend Yield	High Leverage	24	0.448	0.019	0.185	0.736	0.734	0.411	0.000	1.681
4.High Dividend Yield	Low Leverage	24	0.138	0.041	0.247	0.753	0.759	0.342	0.000	1.302

Panel B: 1989-1993

DIVIDEND YIELD	LEVERAGE	N	LEV1 Mean	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
						MEAN	MED	STD	MIN	MAX
1.Low Dividend Yield	Low Leverage	12	0.180	0.015	0.031	0.968	0.930	0.801	0.000	2.848
2.High Dividend Yield	High Leverage	12	0.488	0.032	0.413	0.587	0.643	0.383	0.000	1.250
3.Low Dividend Yield	High Leverage	12	0.479	0.016	0.339	0.661	0.510	0.573	0.125	1.796
4.High Dividend Yield	Low Leverage	12	0.108	0.033	0.379	0.621	0.601	0.509	0.000	1.786

Source: Generated by author

Table 6.14

Statistics for Joint Clienteles with different Dividend Yield-Leverage (LEV2) Combinations

Estimates of the implied marginal tax rate (IMTR) for different combinations of dividend yield and leverage as predicted by the joint clienteles hypothesis. LEV2 is measured as total liabilities divided by total assets. N is the number of observations in each group. DY is the average dividend yield for each group. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are dividends per share. EGR is the average Elton and Gruber ratio. STD is the standard deviation of EGR. MIN and MAX is the minimum and the maximum values of EGR respectively.

Panel A: 1996-2000

DIVIDEND YIELD	LEVERAGE	N	LEV2 Mean	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
						MEAN	MED	STD	MIN	MAX
1.Low Dividend Yield	Low Leverage	24	0.229	0.020	0.313	0.687	0.698	0.349	0.143	1.420
2.High Dividend Yield	High Leverage	24	0.438	0.036	0.174	0.826	0.816	0.347	0.000	1.500
3.Low Dividend Yield	High Leverage	24	0.510	0.018	0.155	0.844	0.798	0.598	0.000	2.692
4.High Dividend Yield	Low Leverage	24	0.162	0.040	0.271	0.729	0.736	0.374	0.000	1.302

Panel B: 1989-1993

DIVIDEND YIELD	LEVERAGE	N	LEV2 Mean	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
						MEAN	MED	STD	MIN	MAX
1.Low Dividend Yield	Low Leverage	12	0.297	0.015	0.071	0.927	0.869	0.770	0.000	2.848
2.High Dividend Yield	High Leverage	12	0.624	0.030	0.436	0.564	0.605	0.414	0.000	1.250
3.Low Dividend Yield	High Leverage	12	0.629	0.016	0.295	0.705	0.526	0.639	0.000	1.796
4.High Dividend Yield	Low Leverage	12	0.333	0.035	0.356	0.644	0.671	0.482	0.000	1.786

Source: Generated by author

Table 6.14 reports the results of testing for joint clienteles when LEV2 is employed. Panel A in Table 6.14 reports the results for the post-FITC period. It shows that the first category of companies with a low dividend yield (2.0 percent) and low leverage (22.90 percent) attract an investors' clientele with an IMTR of 31.30 percent. The second category of companies, with a high dividend yield and high leverage attracts investors' clientele with an IMTR of 17.40 percent. At first glance these results seem to be consistent with the joint clienteles argument. But if the results in the first category are compared with those of the fourth category (companies with high dividend -low leverage) a similar estimate of the IMTR, i.e., 27.10 is obtained and the difference between the mean IMTRs of 4.20 percent is not statistically significant at the five percent level.

The same conclusion can be reached from comparing the second category (mean IMTR of 17.40 percent) with the third category (firms with low dividend yield-high leverage), which is associated with an IMTR of 15.50 percent. Despite different combinations of dividend yield and financial leverage between the two categories, both produce estimates of IMTR that are not significantly different for the pre-FITC period. The results in Panel B are similar to those in Panel B Table 6.13 and they also contradict the joint clienteles hypothesis.

These results indicate that there is nothing unique about the clienteles of investors in Panel A or Panel B and their choices in terms of dividend yield and leverage. Companies with low dividend yield-low leverage have almost the same tax clientele as those companies with high dividend yield-low leverage and vice versa. These results are not consistent with the joint clienteles argument.

Table 6.15 reports the results of the correlation coefficients between the IMTR, average dividend yield, and the different degree of financial leverage measures. The joint clienteles hypothesis predicts a negative and statistically significant

correlation between the IMTR and both dividend yield and financial leverage. The results in Table 6.15 shows that the correlation coefficient between the IMTR and the average dividend yield is negative -0.027, but not statistically significant. The correlation between the IMTR and LEV1 and LEV2 is negative, -0.058, and -0.140 respectively, but it is not statistically significant at any conventional level. These results do not support the joint clienteles hypothesis. The correlation coefficient between LEV1 and LEV2 is positive 0.769 and statistically significant at 5 percent level which indicates that both measures of financial leverage provide similar information.

Table 6.15

Pearson Correlation Coefficient Matrix between DY, LEV1, LEV2, and FINV

Pearson correlation coefficients between the implied marginal tax rate (IMTR), average dividend yield (DY), LEV1, LEV2, and the degree of foreign ownership (FINV). LEV1 is measured as long-term debt divided by long-term capital. LEV2 is measured as total liabilities divided by total assets. Level of significance is indicated by asterisks.

VARIABLE	DY	LEV1	LEV2	FINV
IMTR	-0.027	-0.058	-0.140	-0.020
DY		-0.169	-0.217*	0.049
LEV1			0.769***	0.033
LEV2				0.006
FINV				

* Indicates significance at the five percent level.
*** Indicates significance at the 0.1 percent level.

Source: Generated by author

6.3.1 Summary of the Joint Clienteles Results

The joint clienteles hypothesis postulates that companies with a high dividend yield and high financial leverage will attract investors in a low tax bracket, while companies with a low dividend yield-low financial leverage combination will attract investors in a high tax bracket. The results indicate that the correlation coefficient between the IMTR and dividend yield and financial leverage is negative. None of the correlation coefficients testing the hypothesis are statistically significant. Second, the distribution of dividend yield and

financial leverage do not resemble a bimodal distribution. Third, companies with a high dividend yield-low leverage and vice versa, have almost the same IMTR as those firms with a high dividend yield-high leverage and firms with low dividend yield-low leverage. This suggests that there is nothing unique about the clientele of firms with low dividend – low leverage or high dividend – high leverage. These results taken together do not support the joint clienteles hypothesis. (The same analysis is conducted using the survival firm sample with similar results; the results are reported in Appendix O and P for LEV1 and LEV2).

6.4 Results of Tests for Foreign Investors' Clienteles

The introduction of the imputation tax system in 1988 created a differential tax treatment between resident and non-resident and foreign shareholders until the FITC was introduced and extended the benefits of the imputation tax system to all affected investors. The introduction of FITC increases the after tax cash flow to foreign investors by the amount of the supplementary dividends, which in turn may cause the demand for, and the valuation of, dividends to increase. The implication is that for the period 1996-2000, firms with high dividend yield are expected to attract a clientele of foreign investors.

Table 6.16 provides summary statistics of the degree of foreign ownership proxy calculated as the ratio of total supplementary dividends relative to total dividends. The data sources available do not provide information about the percentage of foreign ownership for New Zealand companies which make it difficult to obtain an exact estimate of the percentage of foreign ownership. Therefore, the proportion of supplementary dividends paid to non-resident investors relative to total cash dividends paid to both resident and non-resident investors is used as a proxy for the degree of foreign ownership. This is based on the assumption that companies with higher ratios are expected to have a higher degree of foreign ownership relative to domestic ownership, thus, the ratio can not be taken as an estimate of the actual percentage of foreign

ownership, rather it is a proxy for the level or the degree of foreign ownership among companies.

In addition, the table provides summary statistics of dividend yield, the drop off ratio, and the implied marginal tax rate for the period after the foreign investors tax reform becomes effective (1996-2000).

Table 6.16

Summary Statistics for the Degree of Foreign Ownership

Summary statistics of the degree of foreign ownership defined as the ratio of total supplementary dividends relative to total dividends (proxy for the degree of foreign ownership), dividend yield, and the implied marginal tax rate (IMTR) and Elton and Gruber ratio. N is the number of observations. Mean is the average of each variable. Median is the median of each variable. STD is standard deviation. Min is the minimum value, and Max is the maximum value. Statistics were calculated over the period from 1996-2000.

Statistics/Variables	N	Mean	Median	STD	Min	Max
Foreign Ownership	96	14.203	17.630	6.854	0.000	26.965
Dividend Yield	96	2.837	2.557	1.416	0.737	10.045
IMTR	96	0.226	0.234	0.428	-1.692	1.000
EGR	96	0.772	0.766	0.428	0.000	2.692

Source: Generated by author

Table 6.17 reports the results of the relationship between the percentage of foreign ownership and dividend yield for the period after the introduction of the FITC (1996-2000). Dividend yield is sorted from lowest to highest into five equal categories in relation to the degree of foreign ownership[35]. The first category with the lowest dividend yields (mean equal to1.50 percent), is associated with an average foreign ownership of 13 percent. The last category with the highest dividend yields (mean of 5.00 percent) corresponds to an average foreign ownership of 14.00 percent. The correlation coefficient between the percentage of foreign ownership and dividend yield is 0.049, which is not significant at the

[35] In addition, dividend yield is sorted from the highest to the lowest into three categories in relation to the degree of foreign ownership. These results are reported in Appendix H.

10 percent level. The results in Table 6.17 do not show much variation in the degree of foreign ownership and the mean difference in the average foreign ownership between the first category (the lowest dividend yield) and the last category (the highest dividend yield) is 1.0 percent which is not statistically significant at any conventional level.

In addition the correlation coefficient between the percentage of foreign ownership and the IMTR is negative (-0.020) although it is not statistically significant (P-value of significance is 0.794). The highest IMTR of 30.00 percent (the third category) corresponds to an average foreign ownership of 14.30 percent. The lowest IMTR of 16.10 percent corresponds to an average foreign ownership of 15.10 percent. The mean difference in the degree of foreign ownership between these groups is 1.10 percent which is not significant. These results do not support the foreign investors' clienteles hypothesis, where companies with higher degree of foreign shareholders are expected to attract clienteles of investors with preferences for a higher dividend yield.

To the extent that foreign investors (as opposed to domestic investors) represent different heterogeneous groups, the results suggest that this distinction does not affect the IMTR or the drop off ratio. The lack of significant differences in the IMTR between companies with higher degree of foreign ownership relative to companies with low degree of foreign ownership is consistent with the argument that investor heterogeneity does not affect the drop off ratio, and it does not influence the results of this study.

Table 6.17

The Relationship between the Degree of Foreign Ownership and Dividend Yield and the Associated IMTR

Degree of foreign ownership is defined as the ratio of total supplementary dividends relative to total dividends. DY is dividend yield. Dividend yield is divided into five categories from the lowest to the highest and the average degree of foreign ownership is calculated for each category along with the estimate of the IMTR[36]. N is the number of observations in each category. Mean is the average of each category. Median is the median. STD is standard deviation. Min is the minimum value, and Max is the maximum value.

Category	N	DY Mean	IMTR Mean	Degree of Foreign Ownership				
				Mean	Median	STD	Min	Max
1	19	0.015	0.261	0.130	0.176	0.086	0.000	0.242
2	19	0.021	0.161	0.154	0.176	0.055	0.000	0.260
3	20	0.026	0.300	0.143	0.176	0.076	0.000	0.270
4	19	0.031	0.240	0.143	0.166	0.055	0.000	0.216
5	19	0.050	0.177	0.140	0.176	0.072	0.000	0.217
All	96	0.028	0.229	0.142	0.174	0.068	0.000	0.269

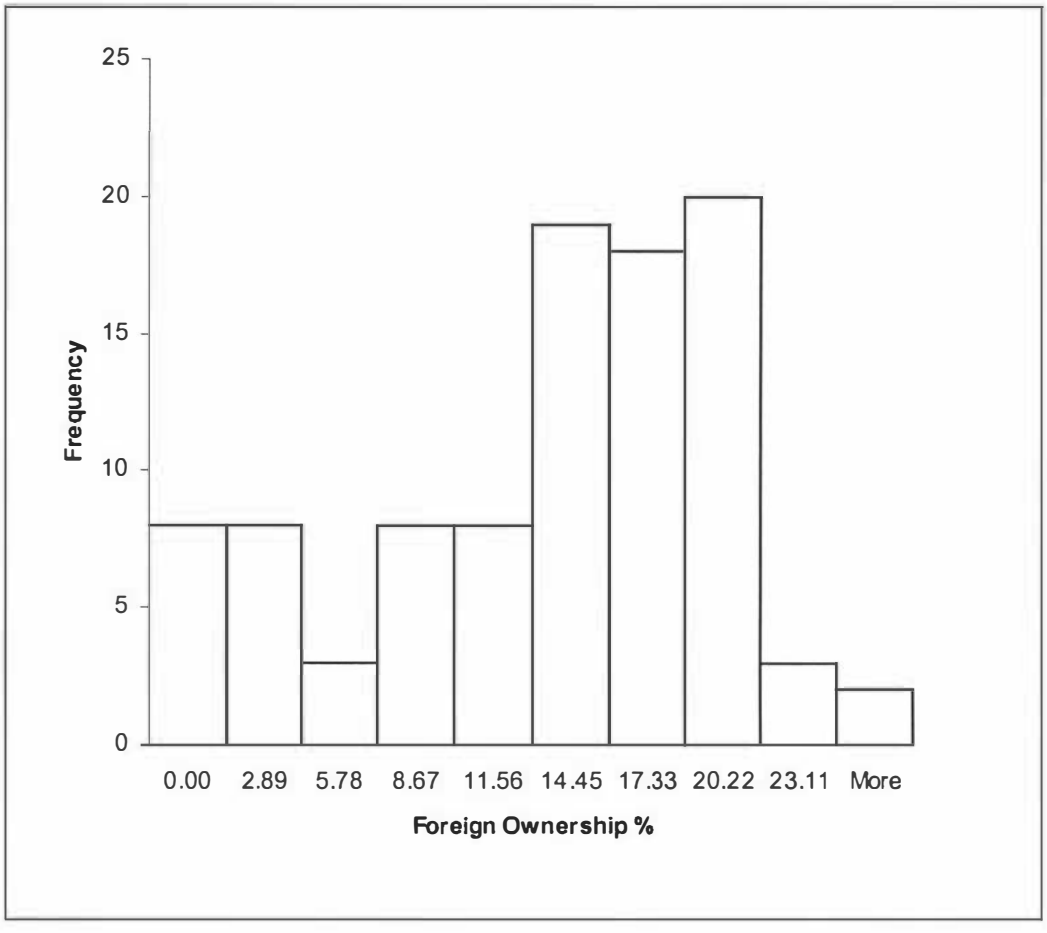
Correlation coefficient between dividend yield and the degree of foreign ownership is 0.049 (0.634), and the correlation coefficient between IMTR and the degree of foreign ownership is -0.027 (0.794).

Source: Generated by author

[36] The data was sorted into three categories; the results are reported in Appendix I.

Figure 6.8

Frequency Distribution of the Degree of Foreign Ownership over the Period 1996-2000



Source: Generated by author

6.5 Institutional Ownership and Non-Tax-Induced Clienteles

Allen et al. (2000) provide a signalling model, which is consistent with institutional clienteles even in the absence of dividend tax advantages to institutional investors over individual investors. They argue that institutions investors should sort themselves toward firms with higher dividend yields because of their higher pre-tax expected returns. Moreover, to the extent that other large, potentially taxable investors would sort themselves preferentially

towards dividend-paying firms, the institutional clientele model would hold even in the absence of taxes.

Table 6.18 reports the results of the relationship between the percentage of financial institutional holdings and dividend yield. An institutional holding is defined as the percentage of shares held by financial institutions relative to the total number of shares outstanding. The total sample is divided and ranked from the lowest to the highest into five categories on the basis of dividend yield in relation to the average percentage of institutional holdings.

The first category with the lowest dividend yield of 1.50 percent is associated with 26.10 percent institutional holdings. The last category with the highest dividend yield of 5.00 percent corresponds to 17.70 percent institutional holdings. The mean difference in the percentage of institutional holdings of 8.40 percent is significant at the five percent level. These results suggest that companies with a smaller (larger) percentage of institutional holdings tend to pay higher (lower) dividends contrary to expectations. In addition, the correlation coefficient between dividend yield and the percentage of institutional holdings is negative (-0.132), though it is not statistically significant. These results are in contrast to those predicted by the institutional clienteles hypothesis where companies with larger percentages of institutional holdings are more inclined to pay a larger percentage of their earnings as dividends and vice versa.

To the extent that institutional investors, and thus companies with large institutional holdings, represent a distinct heterogeneous group (relative to companies with low institutional holdings), the results suggest that such a distinction does not significantly affect the drop off ratio and the results of this study.

Table 6.18

The Relationship between Financial Institutional Holdings, Dividend Yield and the Associated IMTR

IMTR is the implied marginal tax rate. Mean is the average dividend yield (DY). Median is the median of dividend yield. STD is the standard deviation. Min and Max are the minimum and maximum of dividend yield. Categories are based on the values of the average dividend yield[37].

Split into Five Categories

Category	N	DY Mean	IMTR Mean	Financial Institutional Holdings				
				Mean	Median	STD	Min	Max
1	19	0.015	0.261	0.307	0.341	0.178	0.001	0.595
2	19	0.021	0.161	0.256	0.204	0.220	0.002	0.739
3	20	0.026	0.300	0.129	0.134	0.106	0.000	0.344
4	19	0.031	0.240	0.183	0.143	0.174	0.001	0.633
5	19	0.050	0.177	0.168	0.111	0.153	0.006	0.461
All	96							

Split into Three Categories

Category	N	DY Mean	IMTR Mean	Financial Institutional Holdings				
				Mean	Median	STD	Min	Max
1	32	0.017	0.275	0.280	0.275	0.196	0.001	0.739
2	32	0.026	0.245	0.172	0.158	0.159	0.000	0.657
3	32	0.043	0.165	0.171	0.127	0.159	0.001	0.633
All	96							

Source: Generated by author

6.6 Results of the Cross-Sectional Regression

The purpose of the cross-sectional regression is to examine the dividend, financial leverage, joint, institutional, and foreign investors' clienteles hypotheses after controlling for the effect of other variables such as firm size, growth potential, variability and profitability, etc. This section reports the results of the cross sectional regression, attempting to explain the determinants of dividend policy. Dividend yield is defined as the dependent variable and it is used as a proxy for dividend policy. The reason for inclusion of the independent variables chosen is two-fold. First, the proxies for the hypotheses developed in Chapter 4, are dividend and leverage clienteles (represented by IMTR), institutional ownership clienteles (FINST), foreign investor clienteles (FINV). Second, the control proxies used are the effect of investment opportunities (TQ),

profitability (BEP), growth potential (GRTH), variability of operating income (STDTA), firm size (SIZE), and financial leverage (LEV). The first part of this section reports the correlation coefficients between the independent variables to examine the extent of multicollinearity problem, if any. The second part reports the results of the univariate analysis where a single regression model is estimated for each independent variable. The last part of the section deals with the multiple regression model that includes all of the independent variables.

6.6.1 Cross-Correlations between the Independent Variables

Table 6.19 reports the correlation coefficients between the independent variables. The results show that LEV is positively correlated with SIZE, BEP, and TQ, which suggest that large firms tend to have a higher degree of financial leverage, and companies with lower growth potential (TQ) and lower profitability tend to have large degree of financial leverage.

TQ is positively correlated with BEP and STDTA suggesting that firms with high growth potential are associated with higher BEP and higher earnings variability. The percentage of financial institutional holdings is positively correlated with SIZE, indicating that institutions tend to invest in large size firms.

As a precaution against multicollinearity, a separate regression is estimated for each independent variable and variance inflation factor (VIF) tests are performed to ensure that the results of the cross-sectional models are not influenced by multicollinearity. The final conclusions are based on the results of the multivariate analysis since it takes into consideration the effects of all variables. Table 6.20 provides summary statistics of the dependent and the independent variables included in the cross-sectional analysis.

---

[37] The data was also sorted into three categories and the results are reported in Appendix J.

Table 6.19

The Correlation Coefficients between the Independent Variables

BEP is the basic earning power, SIZE is the log of total assets, IMTR is the implied marginal tax rate, LEV is the degree of financial leverage, FINST is the percentage of financial institutional holdings, FINV is the ratio of supplementary dividend to total dividends (proxy for the degree of foreign ownership), STDTA is the standard deviation of operating income standardized by total assets, and GRTH is the annual compound growth rate in total assts.

VARIABLE	BEP	SIZE	IMTR	LEV	FINST	FINV	STDTA	GRTH
TQ	**0.634**	-0.157	-0.043	**-0.401**	0.179	0.101	**0.337**	0.126
	(0.000)	(0.128)	(0.675)	**(0.000)**	(0.081)	(0.330)	**(0.001)**	(0.223)
BEP	1.000	-0.209	0.045	**-0.446**	0.074	0.150	0.099	0.035
		(0.041)	(0.663)	**(0.000)**	(0.471)	(0.145)	(0.333)	(0.736)
SIZE		1.000	-0.177	**0.399**	**0.412**	-0.125	-0.253	-0.033
			(0.085)	**(0.000)**	**(0.000)**	(0.224)	(0.013)	(0.746)
IMTR			1.000	-0.062	0.015	-0.044	0.065	-0.212
				(0.549)	(0.887)	(0.669)	(0.528)	(0.038)
LEV				1.000	0.194	-0.030	-0.097	0.016
					(0.058)	(0.775)	(0.346)	(0.876)
FINST					1.000	0.076	0.041	0.025
						(0.462)	(0.691)	(0.806)
FINV						1.000	-0.130	0.030
							(0.209	(0.770)
STDTA							1.000	-0.152
								(0.141)

Source: Generated by author

TABLE 6.20

Summary Statistics of the Independent Variables

Dividend Yield is the dependent variable defined as dividend per share divided by the market price per share the day before ex-dividend day. Tobin's Q ratio is defined as the market value of the firm divided by the book value of the firm. The Implied Tax Rate is the estimate of the individual implied marginal tax rate using the Elton and Gruber ratio. Return on Equity is net income divided by the market value of equity. Firm's Size is the log of total assets. Earning Variability is the standard deviation of net income scaled by total assets. Firm's Growth is the growth rate in total assets. Institutional Holdings is the percentage of shares held by institutions. Foreign Investment is the degree of foreign ownership. Financial leverage is defined as total debt divided by total debt plus market value of equity. ABRV is the abbreviation of each Variable, MEAN is the average, MIN is the minimum value, and MAX is the maximum value. STD is the standard deviation.

VARIABLE	ABRV	MEAN	MEDIAN	STD	MIN	MAX
Tobin Q Ratio	TQ	2.187	1.526	2.381	0.405	17.306
Implied Tax Rate (%)	IMTR	22.850	23.422	42.841	-169.231	100.000
Basic Earning Power (%)	BEP	9.143	7.841	6.720	-8.608	29.945
Firm's Size	SIZE	5.394	5.093	1.656	2.309	9.074
Earning Variability (%)	STDTA	4.246	2.561	7.075	0.200	57.750
Firm's Growth (%)	GRTH	13.224	11.158	16.587	-12.661	79.356
Financial Instit. Hold. (%)	FINST	20.777	18.399	17.813	0.018	73.892
Foreign Investment (%)	FINV	14.055	17.627	6.970	0.000	26.965
Financial Leverage	LEV	24.000	21.331	19.484	0.000	74.927

If the stock price on the ex-dividend day increases then the Elton and Gruber ratio will be negative and the implied marginal tax rate will take a value greater than one. If the stock price drops by more than the dividend amount, then the Elton and Gruber ratio will be greater than one and the implied marginal tax rate will take a negative value.

Source: Generated by author.

6.6.2 Results of the Univariate Analysis

A univariate analysis was performed by estimating a simple regression model for each one of the nine independent variables. Table 6.21 reports the results of these regressions. For each model the dependent variable used is the dividend yield, which is a proxy for dividend policy.

The regression results as reported in Table 6.21 are as follows:

1- Financial Leverage (LEV): A firm's dividend policy may affect both its use of debt financing and the tax status of investors attracted to the firms stock. It has been established that there is interdependence between a firm's dividend policy and its capital structure (e.g. McCabe, 1979, Peterson and Benesh, 1983). If a firms investment decisions are held constant, the higher its dividend payout, the greater its need for external financing. Given this linkage between dividend policy and financial leverage it is expected to have a negative relationship between dividend yield (proxy for dividend policy) and the degree of financial leverage. The coefficient for LEV is positive (0.002) but it is not statistically significant, these results are not consistent with the prediction that the higher the external financial needs in term of debt financing, the lower the amount of dividend and dividend yield.

2- Investment Opportunities (TQ): Tobin-q ratio serves as a proxy for the investment opportunities of the firm. The argument is that a firm's choices of dividend payout policies are determined in large part by the extent of their investment opportunities. The greater the investment opportunities the lower should be the firm's dividend yield. The results in Table 6.21 show that TQ coefficient is (–0.154) with a t-value of (–2.590), which is statistically significant at five percent level. The F-value is (6.720), which is significant at one percent level and indicates that the regression equation is significant. Both the sign and the level of significance of TQ ratio are consistent with the predicted direction of negative and statistically significant relationship between dividend yield and TQ ratio. These results give support to the arguments that dividend payout policies of the firm are determined in large part by the extent of their investment opportunities, a result which is consistent with the results of Barclay, Smith, and Watts (1999).

3- Profitability (BEP): Basic earning power is calculated by dividing the earnings before interest and taxes (EBIT) by total assets. The ratio shows the raw earning power of the firm's assets before the influence of taxes and leverage and it is used as a proxy for firms' historical profitability. It is assumed that historical profitability is an important determinant of dividend policy, since profitable firms tend to have high growth opportunities and to use a larger proportion of their earning to finance these opportunities instead of paying cash dividends. It is expected that BEP will be negatively related to dividend yield, which implies that the higher the profitability of the firm, the lower will be its dividend yield. The results in Table 6.21 indicate that the coefficient of BEP is negative (-2.715) with a t-value of (-1.260), which is not statistically significant. These results give marginal support to the prior prediction that the higher the firm profitability the lower its dividend payout as measured by dividend yield.

4- Firm Size (SIZE): Several studies (Banz (1981), Reinganum (1981)) has examined firm size effect and concluded that small firms experienced significantly larger risk adjusted returns than larger firms. Reilly and Brown (2000) suggested that firm size represent an additional risk factor that need to be considered along with beta, in such a case, investors require higher returns from relatively small firms even after allowing for beta. Given the additional risk associated with small firms and the relative illiquidity due to thin trading for small New Zealand listed companies, there is a possibility that the market require higher dividend yield from smaller firms relative to larger ones.

The regression model reported in Table 6.21 indicates that the coefficient of SIZE is negative (–0.221) with a t-value of (–2.600) which is statistically significant at one percent level. The F-value of (6.750) is also significant at one percent level. The negative sign of this variable is consistent withy prior prediction of a positive relationship between SIZE and dividend yield and support the hypothesis that smaller firms tend to pay higher dividends.

5- The Implied Marginal Tax Rate (IMTR): The existence of dividend clientele implies that there is a negative relationship between dividend yield and the individual implied marginal tax rate. Under the imputation tax system where the tax differential between capital gains and ordinary income is minimal, no significant relationship between dividend yield and the implied marginal tax rate is anticipated.

Table 6.21 reports the results of the regression model between dividend yield and the IMTR. The parameter estimate of the IMTR is (-0.001) with a t-value of (-0.026), which is not statistically significant. The F-value for the regression model (0.070) is also not statistically significant. This result does not support the dividend clientele hypothesis under the New Zealand tax regime.

6- Variability of Operating Income (STDTA): Companies with a greater stability in their operating income can predict their future cash flows with a greater accuracy. Such firms can commit to paying a larger portion of their income as dividends with less risk of cutting their dividends in the future. Earning stability is calculated as the standard deviation of annual operating income scaled by the book value of total assets. A negative relationship is anticipated between dividend yield and STDTA. The results in Table 6.21 show that the coefficient of STDTA is negative (–0.017) as predicted, with a t-value of (-0.810) which is not statistically significant. The F-value of the regression model is (0.650), which is not statistically significant. These results give little support to the hypothesis that lower variability of the firm's earnings will be associated with a higher dividend distribution and thus a higher dividend yield.

Table 6.21

Results of the Univariate Analysis for the Period 1996-2000

Simple liner regression for each of the independent variable. LEV is the degree of financial leverage. TQ is the Tobin's Q ratio. BEP is the basic earning power. SIZE is the log of total assets. IMTR is the implied marginal tax rate. STDTA is the standard deviation of operating income scaled by total assets. GRTH is growth in total assets. FINST is the percentage of financial institutional holdings, and FINV is the degree of foreign investors.

Dependent Variable	Independent Variables	N	Parameter Estimate	T-value	F-Value	R-Square (%)	Adjusted R-Square	Expected Sign	Expected Vs. Model
DYIELD	LEV	95	0.002	0.270	0.070	0.001	-0.010	Negative	Opposite-NS
DYIELD	TQ	95	-0.154	-2.590**	6.720***	0.067	0.057	Negative	Correct-S
DYIELD	BEP	95	-2.715	-1.260	1.590	0.017	0.006	Negative	Correct-NS
DYIELD	SIZE	94	-0.221	-2.600**	6.750***	0.067	0.057	Negative	Correct-S
DYIELD	IMTR	95	-0.001	-0.026	0.070	0.001	-0.010	Negative	Correct-NS
DYIELD	STDTA	95	-0.017	-0.810	0.650	0.007	-0.004	Negative	Correct-NS
DYIELD	GRTH	95	-0.018	-2.060**	4.260***	0.043	0.033	Negative	Correct-S
DYIELD	FINST	95	-0.022	-2.850**	8.140***	0.080	0.070	Positive	Opposite-S
DYIELD	FINV	95	0.014	0.670	0.460	0.005	-0.006	Positive/Neg.	NS

*** Indicates significance at the one percent level.
** Indicates significance at the five percent level.
* Indicates significance at the 10 percent level.
S=Statistically Significant.
NS=Not statistically significant.

Source: Generated by author

7- Firm's Growth Potential (GRTH): The higher the firm's growth, the greater the additional fund needed to finance future expansion and the more likely that the firm will retain earnings rather than paying dividends as retained earnings are often a cheaper source of financing than other sources. Thus, a negative relationship is expected between dividend yields and the firm's growth rate (GRTH). Table 6.21 shows that the GRTH coefficient is negative (-0.018) (as anticipated) with a t-value of –2.060, which is statistically significant at the one percent level. These results support the hypothesis that companies with higher growth rates tend to have lower dividend yield.

8- Financial Institutional Holdings (FINST): Allen et al. (2000) suggest that institutional clientele can explain firms' dividend behaviour even in the absence of any tax advantages to institutional investors from dividends over retail investors. Given their argument, the institutional clientele implies that firms with high dividend yield are expected to attract a clientele of institutional investors while firms with low dividend yield are expected to attract a clientele of retail investors. Thus a positive relationship is expected between dividend yield and the percentage of institutional holdings.

Table 6.21 shows that the coefficient of FINST is negative (–0.022)), which is contrary to expectation, with a t-value of (–2.850) which is statistically significant at five percent level. The regression model has an F-value of 8.140, which is statistically significant at one percent level. These results do not support the institutional clientele hypothesis that firms with high dividend yield attract institutional investors while companies with low dividend yield attract a clientele of individual or retail investors. These results can be explained by the preference of the financial institutions to invest in large companies seeking for liquidity, the correlation coefficient between SIZE and FINST is positive 0.412 which is statistically significant. In exchange of this liquidity the financial institutions are willing accept lower dividend yield.

9- Foreign Ownership (FINV): The introduction of FITC allows foreign investors to have access to the imputation credits, which increased the after tax cash flow to foreign investors by the amount of supplementary dividends. Thus, the introduction of FITC may increase the demand for, and the valuation of, dividends. The preference of foreign investors for dividends or capital gains depends on many factors such as the tax position of foreign investors in their home country, the provisions of any tax treaties between New Zealand and the foreign investor's home country, and the ability of foreign investors to mitigate tax payments through structuring of their investments. This suggests that in a cross-sectional model the relationship between the percentage of foreign ownership and dividend yield could be positive or negative depending on the aggregate preference of foreign investors.

As shown in Table 6.21, the coefficient for FINV is positive (0.014) as anticipated, though it is not statistically significant, the t-value is (0.670). These results do not support foreign investor's clientele argument.

6.6.3 Summary of the Univariate Regression Analysis Results

A separate single regression model is estimated for each independent variable. This examination of the determinants of dividend policy of the firm as measured by dividend yield alleviates the problem of any interdependence between the independent variables and serves as test for the robustness of the multivariate model. The results indicate that firm's growth opportunities measured by Tobin-q ratio, firm size measured by the natural log of total assets, and firm's growth measured by the growth rate in total assets are significant variables in explaining dividend yield and provide support to prior expectations about these models. The percentage of financial institutional holdings is statistically significant but it has the opposite sign relative to what has been predicted. The proxies for variability of operating income (STDTA), foreign investor clientele (FINV), firm profitability (BEP), the implied marginal tax rate (IMTR), and financial leverage (LEV) are not statistically significant. These results suggest

that under the New Zealand imputation tax system dividend policy of the firm may be determined by the firm's investment opportunities, the growth rate in earnings, and the firm's size. No evidence is found to support tax or foreign investor's clienteles.

6.6.4 Results of the Multivariate Analysis

To incorporate the effect of all the independent variables and their impact on dividend yield, a multivariate analysis is performed[38], where dividend yield is the dependent variable. The explanatory variables are those described in Section 6.5.3 previously. Table 6.22 model 2 shows that the coefficient for TQ (-0.158), a proxy for firm investment opportunities, is negative as expected and it has a White t-value of (-3.840), which is statistically significant at one percent level. This result is consistent with the argument that the firm's choices of dividend payout are determined largely by the extent of its investment opportunities. These results are similar to the results reached from the univariate analysis.

The coefficient of the IMTR is (–0.004) in model 1 with a White t-statistic of (–1.400), which is not statistically significant. The result does not lend support to dividend clientele hypothesis. The BEP parameter estimate is negative as predicted by the model, and its coefficient of (-3.336) with White t-test of (-1.740), is statistically significant at 10 percent level. This result provides marginal support to the notion that profitable firms with high growth opportunities tend to pay a smaller portion of their earnings as dividends.

The coefficient for SIZE is (-0.281) with a White test of (-3.268), is statistically significant at one percent level. This lends support to the argument that small firms due to additional risk and lack of liquidity tend to provide higher dividend

[38] I utilize a General Linear Model (GLM) in addition to regression analysis; both produce the same level of significance.

yields. STDTA, which is a measure of the variability of operating income, is negative (-0.022), as expected, with a White test of (-1.83) which is statistically significant at ten percent level. This supports the notion that the higher the uncertainty of operating income the lower the dividend payments.

Table 6.22 shows that the coefficient for GRTH is negative (-0.020) as expected, with a White t-test of (-3.16), which statistically significant at one percent level. GRTH is used as a proxy for the firms' growth potential, and the results support the argument that the higher the growth potential of the firm, the greater the needs for additional funds and the more likely is the firm to retain earnings rather than pay them as dividends. The FINST coefficient is negative (-0.023) in model 6 with a White t-test of (-3.470) which is statistically significant at one percent level. This is contrary to expectation and it does not support the institutional clientele argument. The coefficient of FINV is positive (0.010) as predicted, but it is not statistically significant in any of the models. This does not support the foreign investors' clientele hypothesis.

The regression models have F-values range from 2.57 to 4.31 and all are significant at conventional levels. The adjusted R-square range from 9.0 (model 6) to 17.3 percent (model 2). The highest value of variance inflation factor (though not reported), which measures the extent of multicollinearity between the independent variables is (1.993). Researchers have used a variance inflation factor (VIF) of 10 as a critical-value rule of thumb to determine whether too much correlation exists between the independent variables, Lee (1993) which suggests that multicollinearity does not represent a problem in this cross sectional models.

The variable IMTRSQR is defined as the square of IMTR. It tests for the possibility that the relationship between dividend yield and the IMTR is not linear. Boyd and Jagannathan (1994) indicate that if equilibrium prices are determined by disparate investor classes, the relation between the drop off ratio and dividend yield may become non-linear. The coefficient of IMTRSQR is

negative -0.419 with a t-statistic of -1.07, which is not statistically significant at any conventional level. This result does not support the contention that the IMTR is non-linear in relation to the dividend yield.

Table 6.22
Results of Multiple Regression Analysis

Results of the cross-sectional analysis for different models. INTER. is the intercept, TQ is Tobin's q ratio, BEP is the basic earning power, SIZE is the log of total assets, IMTR is the implied marginal tax rate, LEV is a measure of financial leverage, FINST is the percentage of financial institutional holdings, FINV is a proxy of foreign investors, STDTA is the standard deviation of earnings standardized by total assets, GRTH is the compound growth rate in total assets, RSQR is the r-square, and ARSQR is the adjusted r-square. The dependent variable is dividend yield for each one of these models.

N0	INTER.	TQ	BEP	SIZE	IMTR	LEV	FINST	FINV	STDTA	GRTH	F-VALE	RSQR	ARSQR
1	4.987	-0.112	-0.254	-0.281	-0.004	0.006	-0.010	0.010	-0.022	-0.020	2.97***	0.237	0.158
	(6.80)***	(-1.35)	(-0.09)	(-2.69)**	(-1.27)	(0.75)	(-1.08)	(0.49)	(-0.99)	(-2.37)**			
	(6.12)***	(-1.98)**	(-0.09)	(-3.268)***	(-1.40)	(0.88)	(-1.46)	(0.51)	(-0.35)	(-3.16)***			
2	4.756	-0.158	-	-0.231	-0.004	-	-0.010	0.015	-	-0.018	4.31***	0.225	0.173
	(7.44)***	(-2.67)***		(-2.45)**	(-1.28)		(-1.12)	(0.76)		(-2.18)**			
	(7.37)***	(-3.84)***		(-2.77)**	(-1.34)		(-1.42)	(0.78)		(-2.90)**			
3	5.134	-	-3.336	-0.257	-0.004	-	-0.011	0.010	-0.033	-0.022	3.35***	0.210	0.148
	(7.01)***		(-1.60)	(-2.55)**	(-1.14)		(-1.24)	(0.48)	(-1.59)	(-2.62)**			
	(6.81)***		(-1.74)*	(-2.87)**	(-1.28)		(-1.54)	(0.48)	(-2.61)**	(-3.27)***			
4	5.165	-0.153	-	-0.304	-0.005	-	-	0.008	-0.022	-0.020	4.25***	0.223	0.171
	(7.75)***	(-2.52)**		(-3.54)***	(-1.46)			(0.39)	(-1.01)	(-2.38)**			
	(6.84)***	(-3.65)***		(-3.35)***	(-1.53)			(0.40)	(-1.83)**	(-2.99)***			
5	3.482	-0.117	-	-	-0.002	-	-0.020	0.022	-0.004	-0.017	3.10***	0.173	0.117
	(8.99)***	(-1.84)*			(-0.69)		(-2.53)**	(1.10)	(-0.17)	(-1.95)*			
	(8.80)***	(-2.74)**			(-0.76)		(-2.67)**	(1.04)	(-0.23)	(-2.61)**			
6	3.306	-	-	-	-0.002	0.006	-0.023	0.018	-0.017	-0.020	2.57**	0.148	0.090
	(7.68)***				(-0.57)	(0.79)	(-2.93)***	(0.88)	(-0.82)	(-2.27)**			
	(6.86)***				(-0.65)	(0.91)	(-3.47)***	(0.83)	(-1.35)	(-2.91)**			

*** Indicates significance at the one percent level.

** Indicates significance at the five percent level.

* Indicates significance at the 10 percent level.

Source: Generated by author

To examine the effect of outliers[39] and the effect of restricting the IMTR variable to values where the IMTR is grater than zero but less than one, a cross sectional regression analysis is conducted on the restricted sample and the results are reported in Appendix Q which report the correlation between the independent variables and Appendix R which reports the results of the cross sectional regression analysis. Appendix Q indicate the correlation coefficient produce the same results as the results of the total sample reported in Table 6.21, Appendix R shows that the regression analysis produce the same significant variables as those reported in Table 6.22, with one exception, the BEP variable lost its previously marginal significance. This analysis indicates that the results of the whole sample are not driven by outliers or negative values of IMTR.

In summary, nine independent variables are utilized to explain the determinants of firm dividend policy as measured by dividend yield. Seven variables have signs that are consistent with the prediction of the model where five variables are statistically significant. The cross sectional model indicates that the Tobin-q ratio (a proxy for firm investment opportunities), GRTH (a proxy for firm growth potential), SIZE (proxy for firm size), STDTA (proxy for the variability of operating income), and BEP (proxy for firm's profitability) are significant determinants of the firm dividend policy under the New Zealand imputation tax regime. No evidence is found to support dividend, leverage, and financial institutional or foreign investors' clienteles.

[39] I utilize a CLUSTER analysis to identify if there are outliers, the analysis produce only one value.

CHAPTER 7

SUMMARY AND CONCLUSION

The theory of finance clearly argues that in the absence of taxes, dividend policy has no effect on the market value of the firm. If taxes are present, then the firm can maximize its value by paying no dividends as long as the effective tax rate on dividend income is higher than the effective tax rate on capital gain income. However, this is not true for all types of investors. Hence there exists the possibility of clientele effects where shareholders choose the firm making the payout they prefer. While several studies examine the validity of the dividend clientele arguments under the classical tax regime, few, if any, empirically examine the tax induced dividend clienteles effect, financial leverage clienteles, and the joint clienteles under an imputation tax system.

The New Zealand imputation tax regime provides a unique opportunity to examine the clientele effect and to draw conclusions with implications relevant to the classical tax system. In addition, the results of this study provide the opportunity to draw conclusions related to small markets in general. First, under the New Zealand full imputation tax system, and in the absence of double taxation and where the tax differentials between dividend income and capital gains is minimal in comparison to the classical tax system, if any, shareholders are expected to be relatively indifferent in terms of having their income in the form of dividend or capital gains. This feature permits neutralization of the effect of taxes and determination of whether the behaviour of share prices on the ex-dividend day is due to taxes or to other non-tax factors. The absence of clientele effects while share prices drop by less than the amount of the dividend suggests that the ex-dividend day stock price behaviour is not due to taxes, or at least that taxes are not an important factor. Second, the fact that both dividends and share prices are reported on the same basis which allows, and to large

extent, to eliminate the effect of other explanations such as the microstructure, discreteness, and tick size.

The main objectives and potential contribution of this study are to capitalize on the unique aspects of the New Zealand market with regard to the absence of double taxation, the equivalent basis in the reporting of dividends and movements in share prices, and the introduction of the FITC to develop testable hypotheses that examine tax induced dividend clienteles, financial leverage clienteles, joint clienteles, institutional clienteles, and foreign investors clienteles. In addition, this study develops a cross-sectional regression model to explain dividend policy determinants and to identify the most valid explanation of dividend policy under the New Zealand tax regime.

Data and Methodology:

The data for this study covers the time period from 1 January 1989 through 31 December 2000, using all the New Zealand listed companies with available data. This time period allows a large number of observations to be obtained given the relatively small number of companies listed on the NZSE. It also makes it possible to test for the effect of the 1993 FITC. The data are collected from the DATEX database of the New Zealand listed companies and from DataStream, which is a comprehensive database for many countries including New Zealand. The final sample consists of 727 year-firm observations.

Dividends per share, imputation credits per share, supplementary dividends per share, the closing market price per share for the day before the ex-dividend day, and the closing market price per share on the ex-dividend day were collected from DATEX for each company and for each payment of ordinary dividends during the study period. Company accounts data such as long-term debt, long-term capital, total liabilities, total assets, interest expenses, operating income, market value of the firm, and book value of the firm are obtained from both DATEX and DataStream on an annual basis for each company and for each year

of the study period. The percentage of financial institutional holdings is obtained from Datex over the period from 1996 to 2000. Other variables such as return on equity, Tobin-q ratio, the standard deviation of operating income, the growth rate in total assets, the degree of foreign ownership are extracted and calculated from the existing variables.

To estimate the implied marginal tax rate, the Elton and Gruber (1970) ratio is calculated as the difference in the closing market price per share on the ex-dividend day minus the closing market price per share the day before the ex-dividend day, divided by the dividend per share. The individual investor's implied marginal tax rate is defined as one minus the Elton and Gruber ratio. The implied marginal tax rate is calculated for each payment of ordinary dividend and has been averaged both across companies and across years for all the companies. To examine the determinants of dividend policy both a univariate and multivariate analysis is conducted using the independent variables previously described with dividend yield as a proxy for the firm dividend policy.

The results of this study are summarized in the paragraphs below.

Behaviour of Share Prices on the Ex-Dividend Day: The results indicate that share prices drop by less than the amount of the dividend on the ex-dividend day. The average drop off ratio is 68.60 percent for the whole period. In addition, the drop off ratio increases from 62.30 percent in the pre-FITC to 77.20 percent in the post-FITC period. These results are similar to those of Elton and Gruber (1970) who report a drop off ratio of 77.7 percent and Eades, Hess and Kim (1984) who reports a drop off ratio of 85 percent using USA data. The implications of this finding are: first that the behaviour of share prices on the ex-dividend day is not due to a tax differential between dividend and capital gains as under the New Zealand tax regime such distinction does not exist. Second, the behaviour of share prices on the ex-dividend day is not due to discreteness and tick size. In New Zealand, both share prices and dividends per

share are reported on the same basis for most of the listed companies. Finally, the introduction of FITC increases the demand and the valuation of dividends, and brings more neutrality to the imputation system since foreign and domestic investors are treated equally with regard to imputation credit.

Dividend Clientele Results: Under the classical tax regime, the dividend clienteles hypothesis predicts that high tax bracket individuals will hold the stock of firms with low dividend yield. Conversely, low tax bracket individuals will hold the stocks of firms with high dividend yield. Under the New Zealand imputation tax system and in the absence of tax differentials between capital gains and ordinary income, no significant relationship is anticipated between dividend yield and the implied marginal tax rate.

The results reveal that share prices in this sample drop by less than the amount of dividend on the ex-dividend day. The average drop-off ratio is 68.6 percent. These results are similar to those of Elton and Gruber (1970) who report a drop off ratio of 77.7 percent and Eades, Hess, and Kim (1984) who reports a drop off ratio of 85 percent. The implication is that the tax differential between capital gains and ordinary income is not a major explanation, or at least it is not the only explanation, of why prices drop by less than the amount of dividends paid. The correlation coefficient between dividend yield and the implied marginal tax rate is negative and is not statistically significant. Further, there is no evidence that the distribution of dividend yields resembles a bimodal distribution where individuals in high tax brackets are attracted to companies with low dividend yields and vice versa. In general, the results do not support the dividend clienteles argument under the New Zealand imputation tax regime.

Leverage Clientele Results: This hypothesis postulates that high tax bracket individuals prefer to hold the stocks of unlevered or low leveraged firms, since their tax savings on personal leverage exceeds the tax savings on corporate leverage. Individuals in low tax brackets prefer to hold the shares of levered or high leveraged firms, since their tax savings on corporate leverage exceeds the

tax savings on personal leverage. New Zealand data provides the opportunity to test for financial leverage clienteles in the absence of dividend policy influence. The implication is that a financial leverage clientele, if any, will be due to a tax effect.

Using three measures of financial leverage, the results show that the correlation coefficient between financial leverage and the individual investor's implied marginal tax rate is negative, as expected, but it is not statistically significant. In addition, the behaviour of financial leverage in relation to the IMTR does not exhibit a bimodal distribution. These results are not consistent with the financial leverage clienteles hypothesis.

The absence of a financial leverage clientele under the New Zealand dividend imputation tax system, where, to a large extent, individual investors are indifferent between capital gains and ordinary income has an important implication. In conjunction with the finding that share prices still drop by less than amount of dividend. This suggests that the observed clientele effect observed under the classical tax regime is not due to a tax effect or taxes play a minor role in the behaviour of stock prices on the ex-dividend day.

The Joint Clienteles Test Results: Joint clienteles imply that high tax investors seek shares in companies with low dividend yield and low financial leverage. Whereas those individuals in low tax brackets should seek shares of firms with high dividend yield and high financial leverage.

The results show first that the correlation coefficient between the IMTR and dividend yield is positive while the correlation between IMTR and financial leverage is negative, but neither relationship is statistically significant. Second, the distribution of dividend yield and financial leverage does not resemble a bimodal distribution. Third, companies with high dividend yield-low leverage and vice versa, have approximately the same IMTR as those firms with a high dividend yield-high leverage and those with low dividend yield-low leverage.

These results do not support the joint clientele argument. Rather they suggest that there is nothing unique about the clienteles of firms with high dividend-high leverage or low dividend-low leverage, since any other combination of dividend and leverage produce similar estimates of the IMTR.

Foreign Investors' Clienteles Test Results: The introduction of the FITC increases the after tax cash flows to foreign investors by the amount of supplementary dividends. This in turn may cause the demand for, and the valuation of, dividends to increase. The results indicate the relationship between dividend yield and the degree of foreign ownership is negative but not significant which does not support foreign investors' clienteles hypothesis. In addition, to the extent that foreign and domestic investors represent different heterogeneous groups, the results suggest that this distinction does not affect the drop off ratio and does not influence the results of this study.

Financial Institutional Clienteles Test Results: The notion of institutional clienteles predict that firms with high dividend yields are expected to attract a clientele of institutional investors while firms with low dividend yields are expected to attract a clientele of retail investors. The results show that the correlation between dividend yields and the percentage of financial institutional holdings is negative and insignificant. This is contrary to the prediction of the hypothesis. The results also suggest, to the extent that institutional investors (companies with a high percentage of institutional holdings) as opposed retail investor (companies with a low percentage of institutional holdings) represent distinct heterogeneous groups, such a distinction does not significantly affect the drop off ratio and the results of this study.

Determinants of Dividend Policy Results: To examine the determinants of dividend policy and to differentiate between different explanations of firms' dividend decisions, the study conducts a cross sectional regression where dividend yield is the dependent variable, as a proxy for dividend policy. The independent variables include first, Tobin's q ratio (TQ) as a proxy for the

firm's investment opportunities, the greater the firm's investment opportunities the lower should be its dividend yield. Second, the implied marginal tax rate (IMTR) is used as a proxy for dividend clienteles. The higher the IMTR the lower the expected dividends yield. Third, the percentage of foreign ownership (FINV) is employed as a proxy for foreign investor's clienteles. The higher the firm's degree of foreign ownership, the higher the dividends yield. Fourth, the expectation is that the percentage of financial institutional holdings (FINST) is used as the proxy for institutional clientele. The higher the firm's percentage of financial institutional holdings, the higher the dividend yield is expected to be. Fifth, basic earning power (BEP), proxies for firm profitability under the expectation that the higher the firm's profitability, the lower the dividends yield. Sixth, growth potential (GRTH) is used as the higher the growth potential, the lower the dividend yield. Seventh, the variability of operating income (STDTA) is employed to proxy for the riskness of operating income. The higher the variability of income the lower the resulting dividends yield. Eighth, firm size (SIZE) is used, as the higher the firm size, the lower the dividends yield. Finally, financial leverage (LEV) represents the idea that the higher the degree of financial leverage the lower the dividend yield.

Out of nine independent variables utilized to explain the determinants of dividend policy, seven had signs that were consistent with the prediction of the model and five variables are statistically significant. The cross-sectional analysis indicates that Tobin's q ratio, a proxy for firm investment opportunities, GRTH, a proxy for firm's potential growth in earnings, SIZE, a proxy for firm's size, BEP, a proxy for firm's profitability, and STDTA, a proxy for the variability of operating income are significant determinants of the firm's dividend policy under the New Zealand tax regime. No evidence is found to support the dividend, leverage, joint, institutional, or foreign investors' clienteles.

In short, the results of this study indicate that share prices drop by less than the amount of dividend even in the absence of tax differentials between dividend income and capital gains. Tax-induced dividend, financial leverage, foreign investors, or institutional clienteles explanations are not consistent with the behaviour of share prices on the ex-dividend day. In addition, the results show that firm dividend policy under the New Zealand tax system is determined by firm investment opportunities, growth potential, firm size, profitability, and the variability of operating income. These are the same fundamental factors that determine dividend policy under the classical tax regime. The fact that share prices on the ex-dividend day exhibit the same behaviour of share prices under the classical system suggests that future studies should search for other explanations regarding the ex-dividend day share price behaviour, which goes beyond tax-induced dividend clienteles, financial leverage clienteles, foreign investors' clienteles, institutional clienteles and price change discreteness.

Limitations and Suggestions for Future Research

Several studies, including this study, used the Elton and Gruber (1970) ratio to obtain an estimate of the marginal investors' implied marginal tax rates. This ratio is based on the assumption that, other things held constant, the difference between the dividend and the ex-dividend day drop off is due to a tax effect. It would perhaps be more beneficial to have a drop off ratio that incorporates the effect of other factors such as transaction costs, microstructure, heterogeneity of investors, and risk, among others. Thus, future research needs to focus on building a model to estimate the implied marginal tax rate that takes into consideration the effects of other variables.

A direct examination of the clientele effect is to ideally have an assessment of each individual marginal investor tax rate, which is extremely difficult. The dividend clienteles argument is based on the assumption that the individual investor's tax rate determines their preference for distribution. While this may be true, other factors such as individual age, education, level and sources of

income, and profession, among other variables may influence individual preferences. Future studies may need to consider alternative behavioural issues to see if they influence the preference of individuals and ultimately their choice between dividends and capital gains.

*****

REFERENCES

Allen, F., Bernardo A. E., and I. Welch "A Theory of Dividends Based on Tax Clienteles," Journal of Finance, 55 (6), 2000: 2499-2536.

Anderson, H., Cahan S., and L. Rose "Stock Dividend Announcement Effects in an Imputation Tax Environment," Journal of Business Finance and Accounting, 28 (5/6), 2001: 653-669.

Bali, R., and G. L. Hite "Ex-Dividend Day Stock Price Behaviour: Discreteness or Tax Induced Clienteles?" Journal of Financial Economics, 47, 1998: 127-159.

Banz, R. W. "The relationship between Return and Market Value of Common Stocks," Journal of Financial Economics, 9 (1), March 1981: 3-18.

Barclay, M. J. "Dividends, Taxes, and Common Stock Prices: The Ex-Dividend Day Behaviour of Common Stock Prices before the Income Tax," Journal of Financial Economics, 19 (1), 1987: 31-44.

Barclay, M. J., Smith, C. W. Jr., and R. L. Watts "The Determinants of Corporate Leverage and Dividend Policies," in The New Corporate Finance: Where Theory Meets Practice," by Donald H. Chew, Jr. McGraw-Hill Publishing, Second Edition, 1999: 214-230.

Bartholdy, J., and K. Brown "Ex-dividend Day Pricing in New Zealand," Accounting and Finance, 39 (2), 1999:111-129.

Bartholdy, J., and K. Brown "Testing For Multiple Types Of Marginal Investor In Ex-Day Pricing," Working Paper, University of Otago, May, 2001.

Bellamy, D. E. "Evidence of Imputation Clienteles in the Australian Equity Market," Asia Pacific Journal of Management, 11(20), 1994: 275-287.

Belsley, D.A., Kuh E., and R. E. Welsch "Regression Diagnostics: Identifying Influential Data and Sources of Collinearity," New York: John Weily & Son, 1980.

Beng, M., and T. Robinson "How to Integrate Company and Shareholder Taxation: Why Full Imputation is the Best Answer," Wellington, Victoria University of Wellington, Institute of Policy Studies, 1986.

Ben-Zion, U., and S. Shalit "Size, Leverage, and Dividend Record as Determinants of Equity Risk," Journal of Finance, 30 (4), 1975: 1015-1026.

Beveridge, S., Bauer L., and R. Sivakumar "The Influence of Taxes and Tick Size on Ex-Dividend Day Prices," Social Science Research Network, February 2002.

Bhattacharya, S. "Imperfect Information, Dividend Policy, and 'The Bird in the Hand' Fallacy," Bell Journal of Economics, 1979: 259-270.

Bird, R. M. "Imputation and the Foreign Tax Credit: Some Critical Notes from an International Perspective," Australian Tax Forum, 4, 1987: 1-34.

Black, F. "The Dividend Puzzle," Journal of Portfolio Management, 2, 1976: 5-8.

Blume, M. "Stock Return and Dividend Yield: Some More Evidence," Review of Economics and Statistics, 62, 1980: 567-577.

Blume, M. E., Crockett J., and I. Friend "Stock Ownership in the United States: Characteristics and Trends," Survey of Current Business, 1974:16-40.

Blume, M. E. "Stock Returns and Dividend Yields: Some More Evidence," Review of Economics and Statistics, 62 (4), 1980: 567-577.

Booth, D. L., and J. D. Johnson "The Ex-Dividend Day Behaviour of Canadian Stock Prices: Tax Changes and Clientele Effects," Journal of Finance, 39, 1984: 457-476.

Bowman, R., Cliffe C. C., and F. Navissi "Implications of Dividend Imputation for Equity Pricing in New Zealand," New Zealand Economic Papers, 2, 1992: 249-260.

Boyd, H., and R. Jagannathan "Ex-Dividend Price Behaviour of Common Stocks," The Review of Financial Studies, 7, 1994: 711-741.

Brav, A., and J. B. Heaton "Competing Theories of Financial Anomalies," Social Science Research Network, April, 2001.

Brennan, M. "Taxes, Market Valuation and Corporate Financial Policy," National Tax Journal, 1970: 417-427.

Brigham, E. F., and M. C. Ehrhardt, Financial Management: Theory and Practice, 10th Edition, Harcourt Publishing Co Inc., 2002.

Brooks, L. D., and C. E. Edwards "Marginal Stockholders and Implied Tax Rates," The Review of Economics and Statistics, 62(4), 1980: 616-619.

Brown, P., and T. Walter "Ex-Dividend Day Behaviour of Australian Share Prices," Australian Journal of Management, 11, 1986: 139-152.

Campbell, J., and W. Beranek "Stock Price Behaviour on Ex-Dividend Dates," Journal of Finance, 10 (4), 1955: 425-429.

Chang, R., and S.G. Rhee "The Impact of Personal Taxes on Corporate Dividend Policy and Capital Structure Decisions," Financial Management, 19(2), 1990: 21-31.

Chaplinsky, S., and H. N. Seyhun "Dividends and Taxes' Evidence on Tax-Reduction Strategies," Journal of Business, 63 (2), 1990: 239-260.

Chay, J., and A. Marsden "Market Reaction to the Introduction of a Foreign Investor Tax Credit Regime in New Zealand," Pacific-Basin Finance Journal, 4 1996: 129-152.

Cliffe, C, and A. Marsden "The Effect of Dividend Imputation on Company Financing Decisions and Cost of Capital in New Zealand," Pacific Accounting Review, 1992: 1-30.

Constantinides, G. M. "Optimal Stock Trading with Personal Taxes," Journal of Financial Economics, 13, 1984: 65-89.

Copland, T. E., and J. F. Weston, Financial Theory and Corporate Policy, Third Edition, Addison Wesley Publishing Company Inc., 1988.

Crockett, J., and I. Friend "Dividend Policy in Perspective: Can Theory Explain Behaviour?" Review of Economics and Statistics, 70 (4), 1988: 603-613.

Crossland, M., Dempsey M., and P. Moizer "The Effect of Cum-to Ex-Dividend Changes on UK Share Prices," Accounting and Business Research, 22(85), 1991: 47-50.

Dammon, R. M., and R. C. Green "Tax Arbitrage and the Existence of Equilibrium Prices for Financial Assets," Journal of Finance, 42 (5), 1987: 1143-1166.

Davidson, I. R. and C. A. Mallin "Ex-Effects: Ex-Dividend Ex-Rights Corroboration and the Implications for Valuation," Accounting and Business Research, 19(75), 1989: 135-141.

Dhaliwal, D. S., Erickson M., and R. Trezevant "A Test of Tax Clienteles for Dividend Policies," National Tax Journal, 52 (2), 1999: 179-194.

Durand, D., and A. May "The Ex-Dividend Behaviour of American Telephone and Telegraph Stock," Journal of Finance, 15 (1), 1960: 19-31.

Dybvig, P. H., and S. A. Ross "Tax Clienteles and Asset Pricing," Journal of Finance, 41 (3), 1986: 751-771.

Eades, K. M., Hess P. J., and E. H. Kim "On Interpreting Security Returns During the Ex-Dividend Period," Journal of Financial Economics, 13 (1), 1984: 3-34.

Eades, K. M., Hess P. J., and E. H. Kim "Market Rationality and Dividend Announcements," Journal of Financial Economics, 14 (4), 1985: 581-604.

Eades, K. M., Hess P. J., and E. H. Kim "Time-Series Variation in Dividend Pricing," Journal of Finance, 49 (5), 1994: 1617-1638.

Easterbrook, F. H. "Two Agency-Cost Explanations of Dividends," American Economic Review, 74 (4), 1984: 650-659.

Elton, E., and M. Gruber "Marginal Stockholder's Tax Rates and the Clientele Effect," The Review of Economics and Statistics, 52, 1970: 68-74.

Elton, E., Gruber, M., and J. Rentzler "The Ex-Dividend Day Behaviour of Stock Prices: A Re-examination of the Clientele Effect: A Comment," Journal of Finance, 39(2), 1984: 551-556.

Espitia, M., and F. Ruiz "Ex-Dividend Day Stock Price Falls on the Spanish Stock Market," Applied Financial Economics, 7, 1997: 481-492.

Fama, E. F., and K. R. French "Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay?" Journal of Financial Economics, 60 (1), 2001: 3-43.

Fama, E. F. and K. R. French "Taxes, Financing Decisions, and Firm Value," Journal of Finance, 53 (3), 1998: 819-843.

Farrar, D., and L. Selwyn "Taxes, Corporate Financial Policy and Return to Investors," National Tax Journal, December, 1967: 444-454.

Fedenia, M., and T. Grammatikos "Risk Premia and the Ex-Dividend Stock Price Behaviour," Journal of Banking and Finance, 17, 1993: 575-589.

Frank, M., and R. Jagannathan "Why Do Stock Prices Drop by Less than the Value of the Dividend? Evidence from a Country with Taxes," Journal of Financial Economics, 47, 1998: 161-188.

Frankfurter, G., and R. Wood, Jr. "The Evolution of Corporate Dividend Policy," Journal of Financial Education, 23, 1997:16-33.

Freund, R. J., and R. C. Littell "SAS System for Regressions," 1986 edition, Cary, NC: SAS Institute Inc., 1986.

Grammatikos, T. "Dividend Stripping, Risk Exposure, and the Effect of the 1984 Tax Reform Act on The Ex-Dividend Day Behaviour," Journal of Business, 62, 1989: 157-173.

Harris, J. M., Jr., Roenfeldt R. L., and P. L. Cooley "Evidence of Financial Leverage Clienteles," Journal of Finance, 38 (4), 1983: 1125-1132.

Harris, P. A. "Passing Corporate Foreign Tax Credits to Shareholders: Lessons from the UK's FID Scheme," Australian Tax Forum, 11 (2), 1994: 229-246.

Head, J. G. "Imputation in the Context of Taxation Reform," in Bureau of Industry Economics, Dividend Imputation: Policy Forum, Canberra: Australian Government Publishing Service, September 1993: 9-69.

Heath, C. D., and A. Jarrow "Ex-Dividend Stock Price Behaviour and Arbitrage Opportunities," Journal of Business, 61, 1988: 95-108.

Hietala, T. "Equity Markets and Personal Taxation," Journal of Banking and Finance, 14, 1990: 327-350.

Hietala, P., and M. Keloharju "The Ex-Dividend Day Behaviour of Finnish Restricted and Unrestricted Shares," Applied Economics Letters, 2, 1995: 467-468.

Howard, P. F., and R. L. Brown "Dividend Policy and Capital Structure under the Imputation System: Some Clarifying Comments," Accounting and Finance, 32(1), 1992: 51-61.

Inland Revenue "Foreign Investor Tax Credit Regime," Tax Information Bulletin, 7(11), 1996: 23-31.

Jensen, M. C. "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," American Economic Review, 76 (2), 1986: 323-329.

Jensen, M. C., and W. H. Meckling "Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure," Journal of Financial Economics, 3 (4), 1976: 305-360.

John, K., and J. Williams "Dividends Dilution, and Taxes: A Signalling Equilibrium," Journal of Finance, 40 (4), 1985: 1053-1070.

Kadapakkam, P. R. "Reduction of Constraints on Arbitrage Trading and Market Efficiency: An Examination of Ex-Dividend Day Returns in Hong Kong after Introduction of Electronic Settlement," Journal of Finance, 55 (6), 2000: 2841-2861.

Kalay, A., and R. Michaely "Dividends and Taxes: A Re-Examination," Financial Management, 29 (2), 2000: 55-75.

Kalay, A. "The Ex-Dividend Day Behaviour of Stock Prices: A Re-Examination of the Clientele Effect," Journal of Finance, 37 (4), 1982: 1059-1070.

Kalay, A. "Stockholder-Bondholder Conflict and Dividend Constraints," Journal of Financial Economics, 1982, 10 (2), 1982: 211-233.

Kaplanis, C. P. "Options, Taxes and Ex-Dividend Day Behavior," Journal of Financial Economics, 21, 1988: 291-298.

Karpoff, M., and R.A. Walkling "Short–Term Trading Around Ex-Dividend Days," Journal of Financial Economics, 21, 1988: 291-298.

Kim, E. H., Lewellen W. G., and J. J. McConnell "Financial Leverage Clienteles: Theory and Evidence," Journal of Financial Economics, 7 (1), 1979: 83-109.

Lakonishok, J., and T. Vermaelen "Tax-induced Trading around Ex-Dividend Days," Journal of Financial Economics, 16, 1986: 287-320.

Lamdin, J., and C. Hiemstra "Ex-Dividend Day Share Price Behaviour: Effects of the Tax Reform Act of 1986," The Review of Economics and Statistics, 1993: 778-783.

Lasfer, A. "Taxes and Dividends: The UK Evidence," Journal of Banking and Finance, 20, 1996: 455-472.

Lee, F. C. "Statistics for Business and Financial Economics," D. C. Heath and Company, Lexington, MA, USA, 1993.

Lewellen, W. G., Stanley K. L., Lease R. C., and G. G. Schlarbaum "Some Direct Evidence on the Dividend Clientele Phenomenon," Journal of Finance, 33 (5), 1978: 1385-1399.

Liljeblom, E., Loflund, A., K. Hedvall "Foreign and Domestic Investors and Tax Induced Ex-Dividend Day Trading," Journal of Banking and Finance, 25, 2001: 1687-1716.

Lintner, J. "Distribution of Incomes of Corporations among Dividends, Retained Earnings and Taxes," American Economic Review, 46(2), 1956: 97-113.

Litzenberger, R., and K. Ramaswamy "Dividends, Short-Selling Restrictions, Tax-Induced Investor Clienteles and Market Equilibrium," Journal of Finance, 35(2), 1980: 469-482.

Marquardt, D. W. "A Critique of Some Ridge Regression Methods: Comments," Journal of the American Statistical Association, 75 (369), 1980: 87-91.

Masulis, R., and B. Trueman "Corporate Investment and Dividend Decisions under Differential Personal Taxation," Working paper, Anderson Graduate School of Management, UCLA, 1986.

McCabe, G. M. "The Empirical Relationship between Investment and Financing: A New Look," Journal of Financial and Quantitative Analysis, 14 (1), 1979: 119-135.

McDonald, L. "Cross-Border Investing With Tax Arbitrage: The Case of German Dividend Tax Credits," The Review of Financial Studies, 14, 2001: 617-657.

Michaely, R. "Ex-Dividend Day Stock Price Behaviour: The Case of the 1986 Tax Reform Act," Journal of Finance, 46, 1991: 845-860.

Michaely, R., M. Murgia "The Effect of Tax Heterogeneity on Prices and Volume around the Ex-Dividend Day: Evidence from the Milan Stock Exchange," Review of Financial Studies, 8 (2), 1995: 369-399.

Michaely, R., and J. Vila "Investors' Heterogeneity, Prices and Volume around the Ex-Dividend Day," Journal of Financial and Quantitative Analysis, 30, 1995: 171-197.

Michaely, R., and J. Vila "Trading Volume with Private Valuation: Evidence from the Ex-Dividend Day," The Review of Financial Studies, 9, 1996: 471-509.

Miller, M. H. and F. Modigliani "Dividend Policy, Growth, and the Valuation of Shares," Journal of Business, 34(4), 1961: 411-433.

Miller, M. H., and M. Scholes "Dividends and Taxes," Journal of Financial Economics, 6(4), 1978: 333-364.

Miller, M. H. "Debt and Taxes," The Journal of Finance, 32(2), 1977: 261-275.

Miller, M. H. and K. Rock "Dividend Policy under Asymmetric Information," Journal of Finance, 40 (4), 1985: 1031-1051.

Modigliani, F., and M. H. Miller "Corporate Income Taxes and the Cost of Capital," American Economic Review, 53(3), 1963: 433-443.

Modigliani, F. "Debt, Dividend Policy, Inflation and Market Valuation," Journal of Finance, 37 (2), 1982: 255-273.

Nelson, V. "New Zealand Dividend Imputation," Working Paper, New Zealand Finance Ministry, 1987: 1-87.

New Zealand Stock Exchange, "Share Ownership Survey 2000,"

Officer, R. R. "The Cost of Capital of a Company under an Imputation Tax System," Accounting and Finance, 34 (1), 1994: 1-17.

Partington, G., and S. Walker "A Note on Transactions Costs and the Interpretation of Dividend Drop-Off Ratio," Working Paper, School of Finance and Economics, University of Technology, Sydney, 2001: 1-20.

Perez-Gonzalez, F. "Large Shareholders and Dividends: Evidence From U.S. Tax Reforms," Working Paper, Harvard University, 2000.

Peterson, P. P., and G. A. Benesh "A Re-examination of the Empirical Relationship Between Investment And Financing Decisions," Journal of Financial and Quantitative Analysis, 18 (4), 1983: 439-453.

Poterba, J. M., and L. Summers "New Evidence that Taxes Affect the Valuation of Dividends," Journal of Finance, 39(5), 1984:15-42.

Poterba, J. M. "The Market Valuation of Cash Dividends: The Citizens Utilities Cash Reconsidered," Journal of Financial Economics, 15 (3), 1986: 395-406.

Reilly, F. K., and K. C. Brown, Investment Analysis and Portfolio Management, Harcourt College Publishers, Six edition, 2000.

Reinganum M. R. "Misspecification of Capital Asset Pricing: Empirical Anomalies Based on Earnings Yield and Market Values," Journal of Financial Economics, 9 (1), March 1981: 19-46.

Richards, R. S., and R. H. Doherty "Taxation of Dividends: The Imputation and Foreign Tax Credit Systems," Sydney, Butterworth, 1987.

Ross, S. A. "The Determination of Financial Structure: The Incentive-Signalling Approach," Bell Journal of Economics, 8(1), 1977: 23-40.

Shewan, J., and J. Hefferman "Company Taxation and Harmonisation Issues For Australia and New Zealand," in Bureau of Industry Economics, Dividend Imputation: Policy Forum, Canberra, Australian Government Publishing Service, September 1993: 255-301

Smith, A. M. C. "Dividend Imputation and International Equity Investment: Unilateral Extension of Imputation to Non-Resident Investors," Australian Tax Forum, 11 (2), 1994: 247-269.

Smith, C. W., Jr., and J. B. Warner "On Financial Contracting: An Analysis of Bond Covenants," Journal of Financial Economics, 7 (2), 1979: 117-162.

Smith, D. "What Has Dividend Imputation Done to R&D Tax Benefits?" Australian Accountant, 65 (11), 1995: 33-35.

Sorjonsnan, P. "Ex-dividend Day Behaviour of Stock Prices around the Finnish 1990 Capital Income Tax Reform," Unpublished Licentiete Thesis, Helsinki School of Economics and Business Administration, 1995.

Taggart, R. A., Jr. "Taxes and Corporate Capital Structure in an Incomplete Market," Journal of Finance, 35 (3), 1980: 645-659.

Vann, R. J. "Eliminating the Double Tax on Dividends: Legal and Practical Issues," Working Paper, Wellington, Victoria University of Wellington, Institute of Policy studies, 1986.

Walker, S., and G. Partington "The Value of Dividends: Evidence from Cum-Dividend Trading in the Ex-Dividend Period," Accounting and Finance, 39, 1999: 275-296.

White, H. "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity," Econometrica, 48 (4), 1980: 817-838.

Winsen, J. "A Kick-Start with no Spark," Australian Accountant, 62 (7), 1992: 37-39.

Zwiebel, J. "Dynamic Capital Structure under Managerial Entrenchment," American Economic Review, 86 (5), 1996: 1197-1215.

APPENDIX A

Summary Statistics and a List of the Companies Included in the Final Sample over the Period 1989-2000

Summary statistics and a list of the companies included in the final sample over the period 1989-2000. CPS is the dividend per share. IPS is the imputation tax credit per share. SUPPL is the supplementary dividend per share for foreign investors. P_a is the market price per share on the ex-dividend day. P_b is the market price per share the day before the ex-dividend day. (P_b-P_a) is the difference in the price before and after the ex-dividend day. IMTR is the implied marginal tax rate using the Elton & Gruber (1970) equation. DY is the dividend yield. EGR is the Elton and Gruber ratio of the change in the price relative to dividends per share. Values are expressed as cents per share.

COMPANY NAME	CPS	IPS	SUPPL	P_a	P_b	(P_b-P_a)	IMTR	DY	EGR
ADVANTAGE GROUP LTD	3.300	1.625	0.582	151.375	151.750	0.375	0.835	0.022	0.165
AFFCO HOLDINGS LTD	2.083	0.000	0.000	53.333	55.500	2.167	-0.133	0.037	1.133
AIR NEW ZEALAND LTD	7.409	1.847	0.588	259.682	266.091	6.409	0.130	0.029	0.870
APPLE FIELDS LTD	3.800	0.253	0.091	162.500	164.500	2.000	0.508	0.025	0.492
ARTHUR BARNETT LTD	4.667	0.341	0.020	160.500	161.500	1.000	0.747	0.032	0.253
AMP LTD	24.828	N	N	2067.500	2057.750	-9.750	1.396	0.012	-0.396
AUCKLAND INTERNATIONAL AIRPOR	5.800	2.855	0.932	272.000	276.000	4.000	0.300	0.022	0.700
AQUARIA 21 LTD	2.000	0.493	0.177	114.000	115.500	1.500	0.250	0.026	0.750
BAYCORP HOLDINGS LTD	8.821	4.300	1.563	500.357	511.286	10.929	-0.008	0.021	1.008
BRIERLEY INVESTMENT LTD	4.455	0.347	0.088	114.682	120.091	5.409	-0.186	0.041	1.186
BROADWAY INDUSTRIES LTD	3.250	1.601	0.331	149.125	150.938	1.813	0.438	0.024	0.563
CARTER HOLT HARVEY LTD	4.979	1.040	0.353	265.542	269.000	3.458	0.343	0.020	0.657
CAVALIER CORPORATION LTD	8.417	4.124	1.041	312.792	318.375	5.583	0.276	0.028	0.724
CDL INVESTMENTS NEW ZEALAND	2.813	1.385	0.496	26.763	28.000	1.238	0.597	0.110	0.403
CDL HOTELS NEW ZEALAND LTD	0.800	0.395	0.141	28.300	28.550	0.250	0.750	0.040	0.250
CEDENCO FOODS LTD	7.000	3.612	1.294	135.000	140.833	5.833	0.137	0.052	0.863
BENDON GROUP LTD	7.313	2.095	0.530	275.438	282.750	7.313	0.205	0.030	0.795

COMPANY NAME	CPS	IPS	SUPPL	P_a	P_b	(P_b-P_a)	IMTR	DY	EGR
CONTACT ENERGY LTD	9.840	4.846	1.738	301.750	311.750	10.000	-0.058	0.031	1.058
DB GROUP LTD	6.000	2.955	1.058	220.643	222.786	2.143	0.558	0.027	0.442
DAIRY BRANDS NEW ZEALAND LTD	0.720	0.355	0.127	50.000	50.000	0.000	1.000	0.014	0.000
DAMBA HOLDINGS LTD	3.125	1.473	0.386	72.600	73.000	0.400	0.840	0.043	0.160
DONAGHYS LTD	5.841	2.341	0.617	261.182	265.045	3.864	0.336	0.025	0.664
DORCHESTER PACIFIC LTD	1.838	0.905	0.408	64.625	67.238	2.613	-0.198	0.032	1.198
DESIGNER TEXTILES (NZ) LTD	2.554	1.258	0.439	85.786	87.857	2.071	0.195	0.035	0.805
EBOS GROUP LTD	10.475	5.036	1.645	393.778	398.389	4.611	0.745	0.029	0.255
EASTERN EQUITIES CORPORATION	2.950	1.042	0.343	80.833	84.000	3.167	0.153	0.037	0.847
ERNEST ADAMS LTD	4.139	2.039	0.412	257.778	261.444	3.667	0.033	0.017	0.967
FISHER & PAYKEL INDUSTRIES LTD	9.625	4.727	1.271	467.625	478.458	10.833	-0.077	0.020	1.077
FLETCHER CHALLENGE LTD-BUILD	6.800	2.914	1.768	327.300	329.500	2.200	0.698	0.023	0.302
FLETCHER CHALLENGE LTD-ENERG	7.400	2.401	1.790	440.200	446.400	6.200	0.172	0.017	0.828
FLETCHER CHALLENGE LTD-FOREST	2.600	1.293	0.406	195.900	197.000	1.100	1.167	0.013	-0.167
FLETCHER CHALLENGE LTD-PAPER	2.400	1.477	0.529	211.600	213.800	2.200	0.200	0.011	0.800
FORCE CORPORATION LTD	1.208	0.595	0.213	67.583	68.083	0.500	0.472	0.018	0.528
FURITFED SUPPLIES LTD	6.688	3.294	1.031	140.375	145.875	5.500	0.384	0.049	0.616
GOODMAN FIELDER LTD	6.072	0.000	0.000	196.333	200.750	4.417	0.251	0.030	0.749
GUINNESS PEAT GROUP PLC	2.044	0.000	0.000	115.600	117.000	1.400	0.558	0.017	0.442
HELLABY HOLDINGS LTD	5.708	2.260	0.809	169.833	175.667	5.833	-0.091	0.032	1.091
HORIZON ENERGY DISTRIBUTION	18.333	9.030	1.908	635.750	657.500	21.750	0.028	0.027	0.972
HALLENSTEIN GLASSON HOLDS	6.292	3.099	0.974	200.333	206.167	5.833	0.233	0.033	0.767
INFRASTRUCTURE & UTILITIES NZ	2.888	1.589	0.422	110.400	113.300	2.900	0.014	0.025	0.986
INFRATIL AUSTRALIA LTD	1.383	0.000	0.000	89.250	89.500	0.250	0.734	0.019	0.266
INDEPENDENT NEWSPAPERS LTD	9.417	4.309	1.147	515.875	521.708	5.833	0.396	0.030	0.604
KIWI INCOME PROPERTY TRUST	4.143	0.685	0.245	102.429	106.000	3.571	0.111	0.040	0.889
LION NATHAN LTD	7.538	0.648	0.274	385.313	392.250	6.938	0.133	0.021	0.867
LYTTELTON PORT CO LTD	6.875	3.391	1.215	158.700	164.000	5.300	0.434	0.041	0.566
LWR INDUSTRIES LTD	5.563	2.744	0.893	149.786	155.357	5.571	0.191	0.038	0.809

COMPANY NAME	CPS	IPS	SUPPL	P_a	P_b	(P_b-P_a)	IMTR	DY	EGR
MR CHIPS HOLDINGS LTD	2.214	1.091	0.377	76.083	76.583	0.500	0.556	0.033	0.444
MCCONNELL DOWELL CORP	6.375	0.000	0.000	293.750	298.750	5.000	0.125	0.020	0.875
METLIFECARE LTD	1.688	0.185	0.066	129.917	130.917	1.000	0.463	0.015	0.537
MAINFREIGHT LTD	2.850	1.403	0.503	149.400	151.100	1.700	0.448	0.019	0.552
MICHAEL HILL INTERNATIONAL LTD	3.075	1.489	0.426	170.667	173.292	2.625	0.110	0.018	0.890
MONTANA GROUP (NZ) LTD	3.375	1.128	0.404	150.500	152.917	2.417	0.314	0.025	0.686
NATURAL GAS CORP HOLDINGS	10.375	4.464	1.511	205.375	215.438	10.063	0.138	0.046	0.862
AXA ASIA PACIFIC HOLDINGS LTD	4.344	0.000	0.000	301.375	307.250	5.875	-0.314	0.014	1.314
NEW ZEALAND OIL & GAS LTD	2.500	N	N	39.000	39.000	0.000	1.000	0.064	0.000
NUPLEX INDUSTRIES LTD	5.917	2.914	0.809	345.708	350.833	5.125	0.242	0.017	0.758
NORTHLAND PORT CORP (NZ) LTD	3.639	1.792	0.554	187.556	190.500	2.944	0.092	0.021	0.908
THE NEW ZEALAND REFINING CO	57.583	27.468	7.630	2289.375	2347.500	58.125	0.251	0.033	0.749
NOBILO WINES LTD	2.500	1.231	0.441	84.500	86.000	1.500	0.250	0.029	0.750
NUFARM LTD	9.542	3.901	0.852	570.333	576.750	6.417	0.283	0.019	0.717
OTTER GOLD MINES LTD	2.333	0.431	0.059	46.417	48.250	1.833	0.200	0.052	0.800
OWENS GROUP LTD	4.198	1.554	0.477	155.250	157.708	2.458	0.513	0.031	0.487
PDL HOLDINGS LTD	15.266	7.173	2.349	750.188	758.813	8.625	0.400	0.024	0.600
PROPERTY FOR INDUSTRY LTD	2.548	0.644	0.216	83.250	84.583	1.333	0.399	0.030	0.601
PORTS OF AUCKLAND LTD	13.857	6.825	2.444	464.286	476.714	12.429	0.225	0.028	0.775
PORT OF TAURANGA LTD	6.978	3.437	1.165	262.556	267.000	4.444	0.283	0.023	0.717
PACIFIC RETAIL GROUP LTD	2.333	1.149	0.324	120.917	125.083	4.167	-1.453	0.021	2.453
PROGRESSIVE ENTERPRISES LTD	3.500	1.581	0.472	160.000	163.000	3.000	0.067	0.022	0.933
E-FORCE LTD	4.000	0.000	0.000	49.500	50.000	0.500	0.800	0.135	0.200
RICHINA PACIFIC LTD	1.929	0.310	0.050	53.500	54.357	0.857	0.714	0.034	0.286
RENAISSANCE CORPORATION LTD	3.375	1.621	0.734	101.375	103.500	2.125	0.249	0.026	0.751
RESTAURANT BRANDS NZ	4.350	2.142	0.767	121.333	125.333	4.000	0.007	0.035	0.993
REID FARMERS LTD	4.032	1.985	0.493	77.417	82.167	4.750	-0.182	0.053	1.182
ROLLER INTERNATIONAL LTD	6.833	3.366	0.118	176.000	176.000	0.000	1.000	0.043	0.000
RADIO OTAGO LTD	5.864	2.888	0.485	284.100	287.650	3.550	0.012	0.025	0.988

COMPANY NAME	CPS	IPS	SUPPL	P_a	P_b	(P_b-P_a)	IMTR	DY	EGR
RADIOWORKS NEW ZEALAND LTD	9.656	4.756	1.296	355.688	360.500	4.813	0.566	0.030	0.434
RYMAN HEALTHCARE LTD	2.650	0.000	N	185.250	186.000	0.750	0.732	0.014	0.268
SANFORD LTD	5.792	2.852	0.735	338.208	343.821	5.613	-0.020	0.017	1.020
SCOTT TECHNOLOGY LTD	5.333	2.626	0.941	222.167	223.167	1.000	0.790	0.024	0.210
SOUTH EASTERN UTILITIES LTD	1.708	0.811	0.108	63.364	64.409	1.045	0.720	0.025	0.280
SHORTLAND PROPERTIES LTD	3.075	0.601	0.225	73.500	75.500	2.000	0.083	0.032	0.917
SHOTOVER JET LTD	1.850	0.831	0.298	108.600	109.200	0.600	0.798	0.019	0.202
SKY CITY LTD	19.150	7.835	2.807	672.500	690.200	17.700	0.084	0.028	0.916
SOUTH PORT NEW ZEALAND LTD	2.946	1.452	0.520	110.571	113.357	2.786	-0.055	0.025	1.055
ST LUKES GROUP LTD	5.900	0.801	0.243	147.929	151.143	3.214	0.478	0.041	0.522
STEEL & TUBE HOLDINGS LTD	11.917	4.289	1.403	374.125	382.708	8.583	0.379	0.042	0.621
TASMAN AGRICULTURE LTD	2.790	0.302	0.046	163.944	164.778	0.833	0.900	0.022	0.100
TAYLORS GROUP LTD	2.570	0.967	0.256	136.214	137.286	1.071	0.517	0.020	0.483
TELECOM CORP OF NZ	10.275	5.061	1.504	600.650	606.950	6.300	0.371	0.019	0.629
TOURISM HOLDINGS LTD	4.864	2.306	0.601	257.955	260.273	2.318	0.630	0.028	0.370
TRANSALTA NEW ZEALAND LTD	4.271	2.104	0.754	213.500	219.750	6.250	-0.260	0.022	1.260
TRUSTPOWER LTD	5.883	2.851	1.021	238.429	244.214	5.786	-0.034	0.025	1.034
TRANZ RAIL HOLDINGS LTD	10.625	3.856	1.382	500.375	507.750	7.375	0.309	0.022	0.691
TRANS TASMAN PROPERTIES LTD	2.960	0.000	0.000	80.600	82.400	1.800	0.413	0.037	0.587
TELSTRA CORPORATION LTD	12.612	0.000	0.000	809.167	820.833	11.667	-0.035	0.016	1.035
TOWER LTD	13.000	1.000	0.358	483.500	499.500	16.000	-0.185	0.026	1.185
UNITEDNETWORKS LTD	13.293	6.547	2.069	544.143	564.071	19.929	-0.275	0.024	1.275
WASTE MANAGEMENT NZ LTD	5.543	2.709	0.625	665.000	667.708	2.708	0.592	0.009	0.408
THE WAREHOUSE GROUP LTD	9.196	4.530	1.622	468.929	474.429	5.500	0.429	0.019	0.571
WILLIAMS & KETTLE LTD	8.188	4.033	1.443	234.625	242.438	7.813	0.152	0.034	0.848
WRIGHTSON LTD	4.608	2.146	0.775	89.000	93.833	4.833	0.059	0.046	0.941

Source: Generated by author

APPENDIX B

Annual Summary Statistics of the Final Sample

These summary statistics include the number of observations (NO. OF OBS) or the number of firms with data available to calculate each variable for the total sample of 103 New Zealand firms. Statistics are reported annually for dividends per share (DPS), the imputation credit per share (IPS), average supplementary dividend per share (SUPPL), average price per share on the ex-dividend day (P_a), average price per share the day before the ex-dividend day (P_b), average difference between P_b minus P_a (PDIFF), average implied marginal tax rate (IMTR) defined as (1-EGR). The average dividend yield defined as DPS divided by average P_b. The Elton and Gruber (1970) Ratio (EGR) is defined as $(P_b-P_a)/DPS$. DPS, IPS, SUPPL, P_a, P_b, and PDIFF are reported in terms of cents per share.

VARIABLE/ STATISTICS	YEAR	DPS	IPS	SUPPL	P_a	P_b	PDIFF	IMTR	DY	EGR
NO. OF OBS.	2000	77	59	55	76	76	76	76	76	76
AVERAGE	2000	8.202	3.597	1.332	308.648	315.259	6.611	0.250	0.033	0.750
MEDIAN	2000	6.000	2.709	1.024	199.500	209.500	4.000	0.243	0.027	0.757
STD DEV	2000	8.610	3.505	1.108	326.423	328.007	12.663	0.909	0.025	0.909
MINIMUM	2000	0.700	0.300	0.098	8.200	8.200	-45.000	-1.958	0.008	-1.875
MAXIMUM	2000	55.000	20.440	4.941	2158.000	2113.000	62.500	2.875	0.197	2.958
NO. OF OBS.	1999	83	65	55	79	79	79	79	79	79
AVERAGE	1999	6.832	2.986	1.144	326.063	331.684	5.620	0.302	0.028	0.698
MEDIAN	1999	5.000	2.364	0.882	215.000	218.000	3.000	0.250	0.025	0.750
STD DEV	1999	5.633	2.465	0.885	333.708	338.357	7.235	0.666	0.019	0.666
MINIMUM	1999	0.750	0.000	0.097	25.000	25.000	-8.000	-1.500	0.006	-1.333
MAXIMUM	1999	30.000	10.589	3.794	1977.000	2002.500	35.000	2.333	0.145	2.500

VARIABLE/ STATISTICS	YEAR	DPS	IPS	SUPPL	P_a	P_b	PDIFF	IMTR	DY	EGR
NO. OF OBS.	1998	82	76	79	79	79	79	79	79	79
AVERAGE	1998	6.752	2.933	0.969	249.804	255.047	5.244	0.337	0.031	0.663
MEDIAN	1998	4.965	1.921	0.617	173.500	179.000	3.000	0.214	0.029	0.786
STD DEV	1998	7.395	4.267	1.500	240.761	247.574	9.594	0.908	0.016	0.908
MINIMUM	1998	0.750	0.000	0.000	22.000	21.000	-7.500	-1.167	0.008	-4.000
MAXIMUM	1998	57.500	32.015	11.471	1665.000	1735.000	70.000	5.000	0.095	2.167
NO. OF OBS.	1997	80	80	80	78	78	78	78	78	78
AVERAGE	1997	6.800	2.828	1.007	311.026	317.188	6.163	0.049	0.025	0.951
MEDIAN	1997	4.500	1.724	0.617	207.750	213.250	4.000	0.067	0.022	0.933
STD DEV	1997	7.702	3.924	1.408	348.107	351.379	6.364	0.812	0.013	0.812
MINIMUM	1997	0.400	0.000	0.000	9.000	9.200	-6.000	-3.436	0.006	-1.200
MAXIMUM	1997	60.000	29.552	10.589	2680.000	2700.000	25.000	2.200	0.069	4.436
NO. OF OBS.	1996	78	78	78	74	74	74	74	74	74
AVERAGE	1996	7.273	3.243	1.171	301.723	307.694	5.971	0.205	0.025	0.795
MEDIAN	1996	5.000	2.001	0.717	192.250	197.500	4.500	0.301	0.022	0.699
STD DEV	1996	10.364	5.239	1.865	355.859	363.100	8.663	0.954	0.012	0.954
MINIMUM	1996	0.720	0.000	0.000	45.000	45.000	-2.500	-4.500	0.009	-1.000
MAXIMUM	1996	87.500	43.097	15.438	2590.000	2650.000	60.000	2.000	0.063	5.500
NO. OF OBS.	1995	67	67	67	63	63	63	63	63	63
AVERAGE	1995	6.871	3.014	1.104	286.532	290.929	4.397	0.311	0.026	0.689
MEDIAN	1995	5.500	1.970	0.772	205.000	208.000	3.500	0.244	0.023	0.756
STD DEV	1995	8.756	4.422	1.584	342.953	345.320	4.785	0.561	0.012	0.561
MINIMUM	1995	0.500	0.000	0.000	31.500	32.500	-4.500	-0.667	0.009	-1.152
MAXIMUM	1995	70.000	34.478	12.340	2550.000	2565.000	20.000	2.152	0.070	1.667

VARIABLE/ STATISTICS	YEAR	DPS	IPS	SUPPL	P_a	P_b	PDIFF	IMTR	DY	EGR
NO. OF OBS.	1994	61	61	61	55	55	55	55	55	55
AVERAGE	1994	8.606	3.811	1.367	344.491	352.500	8.009	0.331	0.025	0.669
MEDIAN	1994	5.000	1.971	0.706	235.000	234.500	5.000	0.200	0.022	0.800
STD DEV	1994	18.952	9.376	3.360	432.956	453.778	23.388	0.863	0.013	0.863
MINIMUM	1994	0.500	0.000	0.000	35.000	33.000	-3.500	-1.024	0.007	-4.000
MAXIMUM	1994	150.000	73.854	26.465	3075.000	3250.000	175.000	5.000	0.072	2.024
NO. OF OBS.	1993	44	44	44	43	43	43	43	43	43
AVERAGE	1993	7.495	3.242	0.433	407.547	413.616	6.070	0.266	0.021	0.734
MEDIAN	1993	5.125	2.216	0.353	267.500	267.500	4.000	0.275	0.020	0.725
STD DEV	1993	10.368	5.208	0.513	509.384	518.255	10.687	0.758	0.011	0.758
MINIMUM	1993	0.750	0.000	0.000	45.000	45.000	-5.000	-3.000	0.007	-1.250
MAXIMUM	1993	70.000	34.478	2.471	3200.000	3265.000	65.000	2.250	0.047	4.000
NO. OF OBS.	1992	42	42	42	38	38	38	38	38	38
AVERAGE	1992	5.552	2.082	0.012	233.368	236.500	3.132	0.203	0.025	0.797
MEDIAN	1992	4.500	1.600	0.000	199.500	201.500	2.000	0.333	0.020	0.667
STD DEV	1992	6.969	3.630	0.059	162.908	164.396	6.401	1.333	0.016	1.333
MINIMUM	1992	0.500	0.000	0.000	43.500	44.500	-15.000	-5.125	0.008	-3.000
MAXIMUM	1992	47.500	23.395	0.353	850.000	857.500	30.000	4.000	0.078	6.125
NO. OF OBS.	1991	36	36	36	31	31	31	31	30	31
AVERAGE	1991	5.034	1.687	0.032	172.274	174.532	2.258	0.504	0.040	0.496
MEDIAN	1991	4.250	0.962	0.000	115.000	115.000	1.000	0.643	0.028	0.357
STD DEV	1991	4.444	2.463	0.164	134.668	135.661	3.374	0.866	0.042	0.866
MINIMUM	1991	0.500	0.000	0.000	30.000	30.000	-2.500	-3.286	0.007	-0.833
MAXIMUM	1991	27.500	13.545	0.971	580.000	580.000	15.000	1.833	0.233	4.286

VARIABLE/ STATISTICS	YEAR	DPS	IPS	SUPPL	P_a	P_b	PDIFF	IMTR	DY	EGR
NO. OF OBS.	1990	35	35	35	31	31	31	31	31	31
AVERAGE	1990	5.067	1.533	0.040	173.629	176.129	2.500	0.460	0.032	0.540
MEDIAN	1990	4.500	1.232	0.000	153.000	157.500	1.500	0.600	0.030	0.400
STD DEV	1990	3.420	1.888	0.173	125.577	126.785	2.961	0.682	0.014	0.682
MINIMUM	1990	0.875	0.000	0.000	30.000	30.000	-2.500	-1.607	0.011	-0.159
MAXIMUM	1990	20.000	9.851	0.971	548.500	553.500	7.500	1.159	0.058	2.607
NO. OF OBS.	1989	42	42	42	35	35	35	35	35	35
AVERAGE	1989	5.110	1.184	0.029	165.343	167.800	2.457	0.528	0.034	0.472
MEDIAN	1989	4.500	0.800	0.000	160.000	165.000	0.000	1.000	0.027	0.000
STD DEV	1989	4.229	1.590	0.133	104.772	105.995	4.871	0.881	0.024	0.881
MINIMUM	1989	0.750	0.000	0.000	30.000	30.000	-3.000	-2.283	0.011	-0.316
MAXIMUM	1989	25.000	7.880	0.794	481.000	493.500	17.500	1.316	0.143	3.283

VARIABLES/ STATISTICS	YEAR	DPS	IPS	SUPPL	P_a	P_b	PDIFF	IMTR	DY	EGR
					OVERALL AVERAGE					
NO. OF OBS.	ALL	103	101	100	103	103	103	103	103	103
AVERAGE	ALL	6.378	2.412	0.759	276.484	281.327	4.843	0.314	0.029	0.686
MEDIAN	ALL	4.864	1.621	0.499	185.250	186.000	3.550	0.283	0.026	0.717
STD DEV	ALL	6.571	3.144	0.929	323.451	327.623	6.827	0.380	0.017	0.380
MINIMUM	ALL	0.720	0.000	0.000	26.763	28.000	-9.750	-1.453	0.009	-0.396
MAXIMUM	ALL	57.583	27.468	7.630	2289.375	2347.500	58.125	1.396	0.135	2.453

Source: Generated by author

APPENDIX C

Summary Statistics and a List of Companies with Selected Company Accounts Data

This is a list of the companies included in the final sample with selected company accounts data. BVEQTY is the book value of equity. TLIAB is the total liabilities. NSHRS is the number of shares outstanding. TASSTS is the total assets. EBIT is earnings before interest and taxes. DEP is depreciation. All values are reported in thousands of dollars.

COMPANY NAME	BVEQTY	TLIAB	NSHRS	TASSTS	EBIT	DEP
ADVANTAGE GROUP LTD	8874.00	5349.25	19967.00	19959.00	3537.75	1018.75
AFFCO HOLDINGS LTD	136664.67	62738.67	204585.33	280149.67	-1689.67	15079.67
AIR NEW ZEALAND LTD	1337341.55	1442871.18	312576.36	3536823.64	212599.91	138476.64
AMP LTD	7399000.00	123608000.00	1089209.00	131007000.00	554000.00	125000.00
APPLE FIELDS LTD	48517.40	34344.20	19803.00	90139.80	5153.20	663.40
ARTHUR BARNETT LTD	23624.67	32985.83	8960.00	60204.17	1999.83	978.17
AUCKLAND INT AIRPORT	505067.50	282795.00	420000.00	832619.00	88519.00	29791.00
AXA ASIA PACIFIC HLDGS LTD	2908313.00	1967089.67	1754896.67	4875436.00	488907.67	18212.33
BAYCORP HOLDINGS LTD	31223.29	3857.14	86687.29	45522.14	5926.00	1975.00
BENDON GROUP LTD	61191.75	5369.75	46629.50	83307.13	10374.25	4215.38
BRIERLEY INVESTMENT LTD	2978187.40	5335907.30	1592579.70	9542749.60	1113930.75	92135.90
BROADWAY INDUSTRIES LTD	19050.13	26806.88	16042.75	55671.88	4735.63	1391.38
CARTER HOLT HARVEY LTD	3649556.33	2586193.17	1365361.00	6708666.17	373453.83	122988.42
CAVALIER CORPORATION LT	68046.58	49896.42	33585.50	132741.33	18366.00	2893.42
CDL HOTELS N Z LTD	203245.50	210838.00	349434.50	546645.75	23239.75	11566.25
CDL INVESTMENTS N Z LTD	35683.50	13291.25	170468.00	55294.00	7458.75	239.25
CEDENCO FOODS LTD	25604.50	9895.00	15232.75	39875.75	2594.75	1882.00
CONTACT ENERGY LTD	1426469.00	1031051.50	603950.00	2472520.50	216896.00	61564.50
DAIRY BRANDS N Z LTD	35074.00	35234.00	48746.00	70308.00	3869.00	354.00
DAMBA HOLDINGS LTD	7600.00	1430.00	8428.00	9905.63	869.29	375.13
DB GROUP LTD	368343.14	244893.14	160276.43	603876.86	48488.43	23234.43
DESIGNER TEXTILES (NZ) LTD	19063.00	7465.86	21674.71	31337.57	3413.43	1347.14
DONAGHYS LTD	63410.09	54108.18	33108.18	117518.27	10807.58	3856.96

COMPANY NAME	BVEQTY	TLIAB	NSHRS	TASSTS	EBIT	DEP
DORCHESTER PACIFIC LTD	9761.00	66647.50	29196.25	85414.50	4036.00	313.25
EASTERN EQUITIES CORP	25698.89	30955.67	28218.67	56574.56	5341.78	4534.78
EBOS GROUP LTD	10063.90	3698.90	16989.30	22057.60	3649.00	345.40
ERNEST ADAMS LTD	19151.89	6367.67	14298.33	25519.56	3074.56	1734.78
FISHER & PAYKEL INDS	295182.58	251357.17	105029.67	610369.33	63436.42	32588.17
FLETCHER CHALLENGE BLD-	685200.00	1565800.00	368548.20	2113000.00	148400.00	72600.00
FLETCHER CHALLENGE ENGY	1299600.00	1873600.00	369755.40	3173200.00	240800.00	319000.00
FLETCHER CHALLENGE FRST	899124.40	565574.40	1112224.60	1779998.40	104750.00	9543.60
FLETCHER CHALLENGE -PPR	1350800.00	5673400.00	742278.00	7030200.00	206000.00	329600.00
FORCE CORPORATION LTD	49395.50	54411.17	144549.17	102140.00	5417.67	1700.33
FURITFED SUPPLIES LTD	7915.75	5636.00	12080.25	13540.50	2562.50	301.63
GOODMAN FIELDER LTD	1139441.90	1449791.70	1132338.40	2859003.60	243083.60	127532.30
GUINNESS PEAT GROUP PLC	181924.25	289135.75	548869.75	471060.00	54548.25	1519.50
HALLENSTEIN GLASSON HLD	32749.58	7231.08	56718.08	53319.33	13321.42	3106.25
HELLABY HOLDINGS LTD	57780.00	21781.17	53950.33	117366.67	16548.00	4298.67
HORIZON ENERGY DIST LTD	98053.83	30643.17	17234.33	137664.17	11103.33	3931.83
INDEPENDENT N/PAPERS LTD	481155.17	287326.58	265590.42	900532.25	116505.33	20567.08
INFRASTRUCTURE UTIL NZ	126105.00	126215.20	176306.80	252320.20	19962.80	1315.80
INFRATIL AUSTRALIA LTD	277333.50	41940.50	304431.00	319274.00	-2156.50	966.50
KIWI INCOME PROP TRUST	287130.14	159839.57	241217.43	463191.57	21851.25	0.00
LION NATHAN LTD	1603275.00	1481225.00	471539.83	3366708.33	248400.00	69633.33
LWR INDUSTRIES LTD	66187.20	16301.00	48782.40	102251.20	15291.60	3926.80
LYTTELTON PORT CO LTD	36830.25	21119.75	101555.00	71650.50	20348.00	4479.75
MAINFREIGHT LTD	35787.00	22527.80	187204.60	84072.80	12182.40	2997.60
MCCONNELL DOWELL CORP	73880.00	122853.67	41574.00	196733.67	21367.00	14722.67
METLIFECARE LTD	51243.83	37549.67	57958.33	106373.00	5465.33	1141.17
MICHAEL HILL INT LTD	21790.92	17033.83	33898.00	46340.42	8751.67	1850.17
MONTANA GROUP (NZ) LTD	246493.67	120174.00	214661.67	425756.00	49757.00	3801.33
MR CHIPS HOLDINGS LTD	5440.57	2892.71	18994.43	10450.43	1754.33	677.14
NATURAL GAS CORP HOLD	300261.75	746775.25	217361.75	1207798.00	118676.13	24442.63
NEW ZEALAND OIL & GAS LTD	50374.00	0.00	106281.00	66728.00	518.00	2734.00
NOBILO WINES LTD	26448.00	24431.00	43825.00	60879.00	3784.00	1650.00

COMPANY NAME	BVEQTY	TLIAB	NSHRS	TASSTS	EBIT	DEP
NORTHLAND PORT CORP (NZ)	38283.88	15198.88	41462.75	62687.63	10446.75	3257.25
NUFARM LTD	247725.17	311849.58	125461.42	651360.75	67734.08	41351.25
NUPLEX INDUSTRIES LTD	52880.67	39436.50	35347.67	110698.00	12308.33	3616.33
OTTER GOLD MINES LTD	32394.33	25179.33	49320.67	69220.40	652.67	4229.00
OWENS GROUP LTD	40743.50	38856.08	54388.17	115158.92	10311.42	7750.67
PACIFIC RETAIL GROUP LTD	23518.17	49887.00	30438.00	95637.83	5166.67	2209.83
PDL HOLDINGS LTD	67654.88	87279.00	13450.63	200146.00	21688.88	10198.50
PORT OF TAURANGA LTD	139687.11	61019.33	76279.78	210881.89	20544.00	4415.67
PORTS OF AUCKLAND LTD	257622.29	23370.43	141002.57	344886.29	62198.71	11026.57
PROGRESSIVE ENTERPRISES	200037.00	244880.50	216882.00	504900.83	29486.50	28037.83
PROPERTY FOR INDUSTRY	110685.83	37193.67	126502.83	152600.67	10782.33	0.00
RADIO OTAGO LTD	4806.73	3056.36	3801.45	8913.45	1703.91	504.64
RADIOWORKS NEW ZEALAND	7318.00	6830.33	8004.00	14115.00	1889.33	783.33
REID FARMERS LTD	27427.17	24304.50	52174.92	69658.83	3317.92	829.75
RENAISSANCE CORPORATION	10962.75	3133.75	31252.25	32756.25	-206.00	508.50
RESTAURANT BRANDS N Z	26015.67	61314.67	92089.67	113559.33	19040.33	8040.33
RICHINA PACIFIC LTD	89673.29	108182.00	97284.86	237560.71	5394.00	5792.14
ROLLER INTERNATIONAL LTD	1598.40	570.20	1125.00	2290.20	203.20	68.00
SANFORD LTD	205579.67	45444.75	87677.75	269796.33	44150.67	10507.17
SCOTT TECHNOLOGY LTD	10816.33	639.00	19579.00	16311.33	4680.33	912.00
SHORTLAND PROPERTIES LTD	160646.56	68774.11	149956.00	207955.78	12751.67	479.22
SHOTOVER JET LTD	18130.25	5964.25	25059.25	26933.75	2205.25	703.75
SKY CITY LTD	167097.60	335650.60	98551.60	570731.20	64622.20	20125.00
SOUTH EASTERN UTILITIES	39020.92	23743.75	59897.83	62079.17	5830.08	528.67
SOUTH PORT NEW ZEALAND	33554.86	19028.57	32400.00	54397.86	4987.43	2033.71
ST LUKES GROUP LTD	470891.00	216129.33	139108.67	687017.00	51294.67	191.00
STEEL & TUBE HOLDINGS LTD	111600.67	51919.17	69739.17	198250.92	24923.42	5088.83
TASMAN AGRICULTURE LTD	137830.22	52932.44	103513.78	199249.67	11756.67	778.78
TAYLORS GROUP LTD	16510.71	6840.29	21402.43	27255.71	2985.43	1591.86
TELECOM CORP OF NZ	2169000.00	2036470.00	1956111.70	5111980.10	1015390.00	512940.00
TELSTRA CORPORATION LTD	10537.00	15437.00	12867.00	25974.00	5102.00	2322.00
THE COLONIAL MOTER CO	71652.33	11591.42	31678.75	103422.25	10664.33	1476.75

COMPANY NAME	BVEQTY	TLIAB	NSHRS	TASSTS	EBIT	DEP
THE N Z REFINING CO LTD	178793.33	587377.92	24000.00	845555.50	54833.75	104303.58
THE WAREHOUSE GROUP LTD	135906.57	76083.71	253588.57	276733.29	61668.00	12357.00
TOURISM HOLDINGS LTD	66083.00	50389.58	52755.00	134435.92	16353.08	11276.92
TOWER LTD	893811.00	572973.00	166700.00	6606813.00	.	23914.00
TRANS TASMAN PROPERTIES	571390.00	699438.40	413600.74	1362778.20	78903.60	530.60
TRANSALTA NEW ZEALAND	300006.50	523264.00	240736.00	823270.50	86843.25	35495.00
TRANZ RAIL HOLDINGS LTD	434429.50	223103.75	123656.50	859476.75	65765.00	38165.50
TRUSTPOWER LTD	286727.33	137590.33	133817.33	466852.67	33010.33	10256.83
UNITEDNETWORKS LTD	616747.33	408133.67	150719.00	1118225.33	117369.83	30278.83
WASTE MANAGEMENT NZ LTD	59261.92	17810.00	58639.00	91973.83	11353.75	6702.08
WILLIAMS & KETTLE LTD	30728.75	19603.25	11081.00	65759.63	3035.00	1390.88
WRIGHTSON LTD	107230.43	178124.71	156054.57	511916.43	25536.00	4890.71

SUMMARY STATISTICS	BVEQTY	TLIAB	NSHRS	TASSTS	EBIT	DEP
NUMBER OF OBSERVATIONS	99	99	99	99	98	99
MEAN	308246.42	362440.97	196533.79	791469.42	64946.96	26553.32
MEDIAN	68046.58	49896.42	86687.29	134435.92	12530.00	3856.96
STANDARD DEVIATION	959415.30	12418530.17	373395.01	13193914.35	173055.69	72301.32
MINMUM	1598.40	0.00	1125.00	2290.20	-2156.50	0.00
MAXIMUM	7399000.00	123608000.00	1956111.70	131007000.00	1113930.75	512940.00

Source: Generated by author

APPENDIX D

Summary Statistics and a List of Companies with Selected Company Account Data

This is a list of the companies included in the final sample using selected company accounts data. SALES is total sales. NI is net income. MVEQ is the market value of equity. LEV1 is the first measure of the degree of financial leverage, which is defined as total debt divided by total assets. LEV2 is the second measure of financial leverage which is defined as total debt divided by total debt plus market value of equity. LEV3 is the third measure of financial leverage which is defined as earnings before interest and taxes divided by interest expenses.

COMPANY NAME	SALES	NI	MVEQ	LEV1	LEV2	LEV3
ADVANTAGE GROUP LTD	41729.25	2175.50	30299.92	0.0137	0.2680	0.0635
AFFCO HOLDINGS LTD	932826.33	-10136.67	113544.86	0.2399	0.2239	-4.3813
AIR NEW ZEALAND LTD	2550442.91	164235.36	831737.29	0.4399	0.4080	0.2180
AMP LTD	15068000.0	-424000.00	22413198.20	0.9271	0.9435	0.8141
APPLE FIELDS LTD	15104.60	2042.00	32575.94	0.3557	0.3810	0.6273
ARTHUR BARNETT LTD	45921.67	95.33	14470.40	0.5239	0.5479	1.0033
AUCKLAND INT AIRPORT	165178.00	46734.50	1159200.00	0.3554	0.3396	0.2150
AXA ASIA PACIFIC HOLDINGS	878437.00	269286.00	5391920.01	0.0582	0.4035	0.3340
BAYCORP HOLDINGS LTD	24883.00	9096.57	443219.71	0.0940	0.0847	0.5162
BENDON GROUP LTD	112301.38	7096.88	131844.91	0.0108	0.0645	0.0321
BRIERLEY INVESTMENT LTD	3536830.10	327576.20	1912543.44	0.5007	0.5592	0.3425
BROADWAY INDUSTRIES LTD	108075.63	1731.13	24214.53	0.5030	0.4815	0.4547
CARTER HOLT HARVEY LTD	2543052.08	198013.17	3672821.09	0.3731	0.3855	0.3564
CAVALIER CORPORATION LTD	198877.00	10046.42	106927.84	0.3173	0.3759	0.1823
CDL HOTELS N ZEALAND LTD	119462.00	8914.50	99763.55	0.4578	0.3857	0.4421
CDL INVESTMENTS NZ	181900.00	5131.75	47731.04	0.2299	0.2404	-0.0383
CEDENCO FOODS LTD	30890.00	904.00	21452.79	0.1482	0.2481	0.4309
CONTACT ENERGY LTD	773312.50	126184.50	1882814.13	0.3761	0.4170	0.2526
DAIRY BRANDS NZ	10626.00	249.00	24373.00	0.4815	0.5011	0.9447
DAMBA HOLDINGS LTD	13172.75	409.13	6152.44	0.0000	0.1444	0.0475
DB GROUP LTD	781078.14	30585.00	357072.99	0.1641	0.4055	0.1092

COMPANY NAME	SALES	NI	MVEQ	LEV1	LEV2	LEV3
DESIGNER TEXTILES (NZ) LTD	35405.43	1939.29	19042.78	0.2488	0.2382	0.1291
DONAGHYS LTD	146483.91	4843.73	87751.73	0.2729	0.4604	0.2707
DORCHESTER PACIFIC LTD	4363.00	1362.25	19630.83	0.6049	0.7803	0.8999
EASTERN EQUITIES CORP	59280.67	2481.11	23703.68	0.3846	0.5472	0.4392
EBOS GROUP LTD	41949.30	2285.10	67683.48	0.0713	0.1677	0.0671
ERNEST ADAMS LTD	45680.89	1837.67	37382.20	0.0826	0.2495	0.1076
FISHER & PAYKEL INDUSTRIES	642024.92	27348.50	502523.19	0.4190	0.4118	0.3704
FLETCHER CHALLENGE BUILD	2775000.00	82200.00	1214366.32	0.5110	0.7410	0.4434
FLETCHER CHALLENGE ENER	1119000.00	144400.00	1650588.11	0.4757	0.5904	0.3729
FLETCHER CHALLENGE FORST	410706.40	76592.20	2191082.46	0.3850	0.3177	-0.0095
FLETCHER CHALLENGE -PAP	3728200.00	-15000.00	1586990.36	0.6369	0.8070	0.8485
FORCE CORPORATION LTD	21283.00	200.33	98413.89	0.3090	0.5327	0.3348
FURITFED SUPPLIES LTD	58336.38	1682.13	17622.06	0.0000	0.4162	0.0169
GOODMAN FIELDER LTD	3664446.30	39109.70	2273169.34	0.3895	0.5071	0.4779
GUINNESS PEAT GROUP PLC	113233.50	42134.75	642177.61	0.5570	0.6138	0.0166
HALLENSTEIN GLASSON HOLD	138016.42	8874.25	116933.78	0.0755	0.1356	0.0085
HELLABY HOLDINGS LTD	171020.33	14274.17	94772.75	0.1659	0.1856	0.0544
HORIZON ENERGY DIST	39999.00	6059.17	113315.74	0.1866	0.2226	0.1366
INDEPENDENT NEWSPAPERS	814052.00	36689.50	1385607.34	0.3289	0.3191	0.1235
INFRASTRUCTURE & UTILITIES	6254.40	16297.60	199755.60	0.4312	0.5002	0.1715
INFRATIL AUSTRALIA LTD	9124.50	-6072.00	272465.75	0.0923	0.1314	-1.1815
KIWI INCOME PROPERTY TRST	20785.75	21011.14	255690.47	0.3197	0.3451	0.1872
LION NATHAN LTD	2151075.00	89950.00	1849615.00	0.4233	0.4400	0.5029
LWR INDUSTRIES LTD	153704.80	10107.60	75786.94	0.1858	0.1594	0.0844
LYTTELTON PORT CO LTD	53554.00	12830.25	166550.20	0.3103	0.2948	0.0601
MAINFREIGHT LTD	220594.20	7045.60	282866.15	0.3324	0.2680	0.0981
MCCONNELL DOWELL CORP	397111.33	15081.00	124202.33	0.0878	0.6245	0.0088
METLIFECARE LTD	43776.00	3863.17	75877.12	0.3603	0.3530	0.3378
MICHAEL HILL INTRNL	96703.42	4769.42	58742.41	0.4060	0.3676	0.1564
MONTANA GROUP (NZ) LTD	305641.33	31159.67	328253.47	0.3159	0.2823	0.1823
MR CHIPS HOLDINGS LTD	16836.29	920.71	14546.57	0.3117	0.2768	0.1549
NATURAL GAS CORP HOLDINGS	321142.50	37411.38	468278.72	0.6942	0.6183	0.5675

COMPANY NAME	SALES	NI	MVEQ	LEV1	LEV2	LEV3
NEW ZEALAND OIL & GAS LTD	14621.00	-186.00	41449.59	0.0000	0.0000	-1.5212
NOBILO WINES LTD	50361.00	1734.00	37689.50	0.0000	0.4013	0.2495
NORTHLAND PORT CORP (NZ)	55572.25	6245.50	78986.54	0.2744	0.2425	0.1203
NUFARM LTD	643405.58	36856.08	723598.72	0.4289	0.4788	0.3413
NUPLEX INDUSTRIES LTD	137891.08	6422.17	124011.40	0.3850	0.3563	0.1677
OTTER GOLD MINES LTD	29969.50	515.00	23797.22	0.2356	0.3638	0.1359
OWENS GROUP LTD	349461.08	5946.25	85774.67	0.3551	0.3374	0.2814
PACIFIC RETAIL GROUP LTD	203338.67	4096.83	38072.87	0.2576	0.5216	-0.2069
PDL HOLDINGS LTD	290024.38	10289.38	102065.02	0.4483	0.4361	0.3007
PORT OF TAURANGA LTD	43024.11	10719.00	203667.01	0.2959	0.2894	0.2190
PORTS OF AUCKLAND LTD	129684.57	41112.86	672179.40	0.0000	0.0678	0.0281
PROGRESSIVE ENTERPRISES	1754556.00	12140.67	353517.66	0.4276	0.4850	0.4342
PROPERTY FOR INDUSTRY LTD	151000.00	6978.83	107000.31	0.2515	0.2437	0.2060
RADIO OTAGO LTD	11187.00	858.09	10934.88	0.2132	0.3429	0.1569
RADIOWORKS NEW ZEALAND	21405.00	115.67	28854.42	0.2936	0.4839	0.1681
REID FARMERS LTD	203212.33	3747.42	42870.39	0.1899	0.3489	-0.6076
RENAISSANCE CORPORATION	86691.00	-1012.50	32346.08	0.1255	0.0957	-1.2002
RESTAURANT BRANDS NZ	219905.00	10314.67	115419.05	0.7016	0.5399	0.2220
RICHINA PACIFIC LTD	289536.33	-5169.00	52881.27	0.3619	0.4554	1.4773
ROLLER INTERNATIONAL LTD	4571.80	72.00	1980.00	0.0805	0.2490	0.2372
SANFORD LTD	281926.50	27278.17	301454.37	0.0651	0.1684	0.0654
SCOTT TECHNOLOGY LTD	27414.33	3059.67	43693.80	0.0000	0.0392	0.0197
SHORTLAND PROPERTIES LTD	14421.44	8301.22	113216.78	0.1641	0.3307	0.2383
SHOTOVER JET LTD	17137.75	1503.75	27364.70	0.2097	0.2214	0.2457
SKY CITY LTD	217413.80	31613.40	680203.14	0.6651	0.5881	0.2981
SOUTH EASTERN UTILITIES	49916.33	735.33	38579.65	0.3098	0.3825	0.3421
SOUTH PORT NEW ZEALAND	54270.57	2935.86	36727.71	0.2846	0.3498	0.2029
ST LUKES GROUP LTD	57422.83	31750.33	210252.81	0.2627	0.3146	0.2241
STEEL & TUBE HOLDINGS LTD	337450.58	13218.33	266897.60	0.0833	0.2619	0.1885
TASMAN AGRICULTURE LTD	24505.56	7718.33	170567.70	0.2738	0.2657	0.2805
TAYLORS GROUP LTD	30989.71	1428.71	29382.48	0.2603	0.2510	0.2349
TELECOM CORP OF NZ	3010340.00	592050.00	11872619.96	0.3768	0.3984	0.1398

COMPANY NAME	SALES	NI	MVEQ	LEV1	LEV2	LEV3
TELSTRA CORPORATION LTD	16819.00	3004.00	105616.63	0.3937	0.5943	0.1243
THE COLONIAL MOTER CO LTD	337483.67	6620.33	65443.02	0.0351	0.1121	0.1154
THE NEW ZEALAND REFINING	169032.67	39463.00	563400.00	0.7573	0.6947	-0.0776
THE WAREHOUSE GROUP LTD	663251.29	39222.29	1203096.64	0.1398	0.2749	0.0748
TOURISM HOLDINGS LTD	75749.00	7876.83	137306.88	0.4035	0.3748	0.2656
TOWER LTD	800790.00	99651.00	832666.50	.	0.0867	.
TRANS TASMAN PROPERTIES	93103.00	19160.60	340807.01	0.5203	0.5132	0.7052
TRANSALTA NEW ZEALAND	610708.00	33506.00	529017.36	0.5099	0.6356	0.3467
TRANZ RAIL HOLDINGS LTD	580076.25	56491.00	627865.88	0.3150	0.2596	0.2153
TRUSTPOWER LTD	174181.50	16902.83	326801.04	0.3239	0.2947	0.2692
UNITEDNETWORKS LTD	360030.17	74523.00	850162.82	0.3890	0.3650	0.2289
WASTE MANAGEMENT NZ LTD	59295.58	6793.33	391537.49	0.2108	0.1936	0.0654
WILLIAMS & KETTLE LTD	82746.13	2227.38	26864.50	0.2628	0.2981	-0.0673
WRIGHTSON LTD	558580.29	15843.57	146431.21	0.5331	0.3480	0.1104

SUMMARY STATISTICS	SALES	NI	MVEQ	LEV1	LEV2	LEV3
NUMBER OF OBSERVATIONS	99	99	99	98.0000	99.0000	98.0000
MEAN	444006.01	30652.91	531307.07	0.3069	0.3641	0.1822
MEDIAN	137891.08	7718.33	116933.78	0.3110	0.3498	0.2044
STANDARD DEVIATION	1685353.79	90291.45	2602779.52	0.1885	0.1769	0.5989
MINMUM	4363.00	-424000.00	1980.00	0.0000	0.0000	-4.3813
MAXIMUM	15068000.0	592050.00	22413198.20	0.9271	0.9435	1.4773

Source: Generated by author

APPENDIX E

Summary Statistics and a List of Companies of the Final Sample with the Independent Variables Included in the Cross-Sectional Analysis.

This is a list of the companies included in the final sample along with some of the independent variables included in the cross-sectional model. FINV is the percentage of shares held by foreign investor. APAY is the average dividend payout ratio. FINST in the degree of institutional holdings. STDTA is the standard deviation of net income. GWTH is the growth rate in total assets.

NAME	FINV	APAY	FINST	STDTA	GWTH
ADVANTAGE GROUP LTD	17.6439	30.2878	19.70	799	12.272
AFFCO HOLDINGS LTD	0.0000	42.9500	18.60	55385	-6.751
AIR NEW ZEALAND LTD	7.9362	14.1011	6.10	57573	22.42
ARTHUR BARNETT LTD	0.4339	43.9500	5.20	1612	16.943
AUCKLAND INTL AIRPORT	16.0690	52.1242	26.70	6107	2.113
AXA ASIA PACIFIC HOLDINGS	0.0000	28.3076	0.10	55398	-1.588
BAYCORP HOLDINGS LTD	17.7190	84.0653	34.10	4658	23.447
BENDON GROUP LTD	7.2427	48.0462	53.60	7826	-6.537
BRIERLEY INVESTMENT LTD	1.9778	21.6567	46.10	67088	0.041
BROADWAY INDUSTRIES LTD	10.1788	30.1185	1.40	939	7.268
CARTER HOLT HARVEY LTD	7.0840	34.3329	36.40	113618	14.56
CAVALIER CORPORATION LTD	12.3658	28.1372	4.60	1788	0.654
CDL HOTELS NEW ZEALAND	17.5938	31.3588	18.20	7453	4.721
CDL INVESTMENTS N Z	17.6400	29.0900	0.90	2032	-1.884
CEDENCO FOODS LTD	18.4833	2.8700	1.40	4543	-8.304
CONTACT ENERGY LTD	17.6626	47.0967	19.00	41297	6.176
DAIRY BRANDS NEW ZEALAND	17.6389	15.6300	29.30	2420	-7.81
DAMBA HOLDINGS LTD	12.3657	64.3752	6.40	315	18.125
DB GROUP LTD	17.6369	31.4422	14.30	12574	-5.015

DESIGNER TEXTILES (NZ) LTD	17.1944	28.5404	14.30	1175	31.341
DONAGHYS LTD	10.5703	39.9242	19.90	4125	0.998
DORCHESTER PACIFIC LTD	22.2109	39.3820	0.00	1031	37.283
EASTERN EQUITIES CORP	11.6309	33.5515	21.10	1480	22.353
EBOS GROUP LTD	15.7079	77.8797	15.70	1510	29.717
ERNEST ADAMS LTD	9.9436	32.2035	25.20	764	10.853
FISHER & PAYKEL INDUSTRIES	13.2069	36.9640	65.70	14548	9.116
FLETCHER CHALLENGE BUILD	26.0018	30.4882	57.80	52275	-2.763
FLETCHER CHALLENGE ENGY	24.1892	18.9487	52.80	117509	12.841
FLETCHER CHALLENGE FRST	15.6038	37.7556	59.50	60232	13.779
FLETCHER CHALLENGE -PPR	22.0417	43.9500	48.50	229169	2.512
FORCE CORPORATION LTD	17.6207	33.9100	21.20	491	24.364
FURITFED SUPPLIES LTD	15.4159	48.0266	7.60	624	2.986
GOODMAN FIELDER LTD	0.0000	37.5400	0.30	64645	-4.202
GUINNESS PEAT GROUP PLC	0.0000	26.6262	26.80	46554	-2.617
HALLENSTEIN GLASSON HOLD	15.4815	40.2120	25.30	4081	0.032
HELLABY HOLDINGS LTD	14.1664	21.5751	14.50	1049	16.227
HORIZON ENERGY DIST LTD	10.4073	52.1462	0.10	1219	34.224
INDEPENDENT NEWSPAPERS	12.1796	68.1660	35.40	12662	18.156
INFRASTRUCTURE & UTILITIES	14.6018	31.2423	34.40	13280	65.486
INFRATIL AUSTRALIA LTD	0.0000	0.0000	1.60	14398	-12.661
KIWI INCOME PROPERTY TRST	5.9143	47.5578	37.70	11168	29.225
LION NATHAN LTD	3.6294	39.5156	73.90	85304	5.941
LWR INDUSTRIES LTD	16.0528	26.8463	7.80	3063	2.799
LYTTELTON PORT CO LTD	17.6713	54.4175	19.50	1807	-1.499
MAINFREIGHT LTD	17.6421	75.7257	28.20	1730	27.83
MCCONNELL DOWELL CORP	0.0000	17.5741	0.20	4452	8.904
METLIFECARE LTD	3.9210	25.3297	39.20	2920	30.572
MICHAEL HILL INTNL	13.8388	21.8552	16.00	2603	17.393
MONTANA GROUP (NZ) LTD	11.9827	23.2507	20.00	14828	2
MR CHIPS HOLDINGS LTD	17.0290	45.6809	0.60	499	-4.297
NATURAL GAS CORP HOLD	14.5602	60.2792	33.20	14080	16.485

NEW ZEALAND OIL & GAS LTD	0.000	7.9400	11.10	2220	1.61
NOBILO WINES LTD	17.6400	63.1848	0.10	5930	15
NORTHLAND PORT CORP (NZ)	15.2198	24.1579	4.90	1773	15.442
NUFARM LTD	8.9312	32.4807	6.10	19206	14.492
NUPLEX INDUSTRIES LTD	13.6683	32.5654	44.00	4475	27.396
OTTER GOLD MINES LTD	2.5143	0.0000	18.10	7847	-4.603
OWENS GROUP LTD	11.3538	38.3968	21.30	3450	0.633
PACIFIC RETAIL GROUP LTD	13.8643	17.3358	18.00	1894	54.655
PDL HOLDINGS LTD	15.3896	19.9558	8.20	4410	12.845
PORT OF TAURANGA LTD	16.6927	49.6561	24.80	5460	13.024
PORTS OF AUCKLAND LTD	17.6397	47.5251	10.00	8955	0.971
PROGRESSIVE ENTERPRISES	13.4939	62.5243	24.70	19336	16.579
PROPERTY FOR INDUSTRY LTD	8.4696	46.1927	40.60	2255	25.37
RADIO OTAGO LTD	8.2756	25.9767	1.70	414	10.185
RADIOWORKS NEW ZEALAND	13.4175	72.6800	15.10	1847	79.356
REID FARMERS LTD	12.2199	56.1325	2.00	546	9.886
RENAISSANCE CORPORATION	21.7580	8.0100	0.20	3866	-2.11
RESTAURANT BRANDS N Z	17.6398	38.8369	63.30	2478	14.13
RICHINA PACIFIC LTD	2.6074	15.1800	7.50	19893	-0.924
SANFORD LTD	12.6871	18.6156	14.30	14161	20.48
SCOTT TECHNOLOGY LTD	17.6438	34.1283	15.50	454	-0.498
SHOTOVER JET LTD	16.0811	30.8293	0.40	873	50.968
SKY CITY LTD	14.6585	59.6982	25.50	22601	15.033
SOUTH EASTERN UTILITIES LTD	6.3255	30.7000	2.50	990	3.918
SOUTH PORT NEW ZEALAND	17.6412	32.5167	9.50	1020	-7.495
ST LUKES GROUP LTD	4.1102	25.8498	45.60	6704	17.142
STEEL & TUBE HOLDINGS LTD	11.7741	62.8716	24.30	9634	2.776
TASMAN AGRICULTURE LTD	1.6599	37.4179	22.30	3189	30.35
TAYLORS GROUP LTD	9.9558	38.5045	9.30	864	5.82
TELECOM CORP OF NZ	14.6399	33.9482	54.10	248853	7.003
TELSTRA CORPORATION LTD	0.0000	54.0208	28.90	14707	3.46
THE COLONIAL MOTER CO LTD	13.8701	31.0033	3.10	3166	1.861
THE NEW ZEALAND REFINING	13.2505	35.0201	6.90	19830	30.277

THE WAREHOUSE GROUP LTD	17.6419	59.4588	20.40	18526	23.69
TOURISM HOLDINGS LTD	12.3645	32.5741	48.30	5503	25.902
TOWER LTD	2.7538	21.7469	11.30	16510	41.2
TRANS TASMAN PROPERTIES	0.0000	63.8946	23.20	9338	10.645
TRANSALTA NEW ZEALAND	17.6438	30.6896	2.60	15146	26.978
TRANZ RAIL HOLDINGS LTD	13.0024	23.2577	39.90	11007	11.463
TRUSTPOWER LTD	17.3555	46.5771	24.20	6746	36.231
UNITEDNETWORKS LTD	15.5615	26.8841	0.80	41015	42.131
WASTE MANAGEMENT NZ LTD	11.2787	47.8456	35.60	3996	29.6
WILLIAMS & KETTLE LTD	17.6267	40.7321	6.00	1153	13.309
WRIGHTSON LTD	16.8192	45.3907	28.50	12005	-8.069

Source: Generated by author

APPENDIX F

Results of Tests for Leverage Clienteles Split into Three Categories for LEV1

This table depicts the relationship between leverage and estimates of investors' personal implied marginal tax rates. N is the number of observations in each category. DPS are the dividends per share. LEV1 is the book value of long-term debt divided by book value of long-term debt plus equity. IMTR is the estimate of the investors' implied marginal tax rate. Mean is the average of the Elton and Gruber (1970) ratio. Median is the median of the ratio. STD is the standard deviation. Min is the minimum value. Max is the maximum value. Corr is the correlation coefficient between LEV1 and the Elton and Gruber ratio.

Panel A: 1989-2000

Category	N	LEV1 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	33	0.104	0.346	0.654	0.751	0.352	0.000	1.314
2	33	0.311	0.290	0.710	0.657	0.391	0.095	2.453
3	33	0.510	0.291	0.709	0.814	0.405	-0.396	1.275
All	99	0.306	0.309	0.691	0.717	0.380	-0.396	2.453

Panel B: 1996-2000

Category	N	LEV1 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	31	0.0879	0.1984	0.8016	0.7623	0.5331	0.0000	2.6923
2	32	0.3046	0.3358	0.6642	0.6949	0.3082	0.0000	1.3333
3	31	0.5079	0.1469	0.8531	0.8866	0.4047	0.0000	1.6806
All	94	0.3002	0.2285	0.7715	0.7571	0.4284	0.0000	2.6923

Panel C: 1989-1993

Category	N	LEV1 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	16	0.072	0.103	0.897	0.758	0.744	0.000	2.848
2	16	0.336	0.506	0.494	0.370	0.439	0.000	1.364
3	16	0.533	0.272	0.728	0.639	0.494	0.000	1.796
All	48	0.314	0.289	0.711	0.639	0.588	0.000	2.848

The correlation between leverage (LEV1) and IMTR is –0.0578.

Source: Generated by author

APPENDIX G

Results of Tests for Leverage Clienteles Split into Three Categories for LEV2

This table depicts the relationship between leverage and estimates of investors' personal implied marginal tax rates. N is the number of observations in each category. DPS are the dividends per share. LEV2 is defined as the book value of total liabilities divided by the book value of total assets. IMTR is the estimate of the investors' implied marginal tax rate. Mean is the average of the Elton and Gruber (1970) ratio. Median is the median of the ratio. STD is the standard deviation. Min is the minimum value. Max is the maximum value. Corr. is the correlation coefficient between LEV2 and the Elton and Gruber ratio.

Panel A: 1989-2000

Category	N	LEV2 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	33	0.187	0.407	0.593	0.616	0.336	0.000	1.133
2	33	0.349	0.289	0.710	0.717	0.308	-0.167	1.314
3	33	0.559	0.234	0.766	0.800	0.466	-0.392	2.453
All	99	0.364	0.314	0.686	0.717	0.380	-0.396	2.453

Panel B: 1996-2000

Category	N	LEV2 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	32	0.1448	0.2822	0.7178	0.6984	0.3709	0.0000	1.4203
2	31	0.3261	0.2930	0.7070	0.7448	0.4850	0.0000	2.6923
3	32	0.5280	0.0971	0.9029	0.9181	0.4056	0.0000	1.6806
All	95	0.3330	0.2285	0.7715	0.7810	0.4284	0.0000	2.6923

Panel C: 1989-1993

Category	N	LEV2 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	16	0.255	0.143	0.857	0.802	0.768	0.000	2.848
2	16	0.484	0.367	0.633	0.521	0.429	0.125	1.732
3	16	0.673	0.362	0.638	0.633	0.521	0.000	1.796
All	42	0.471	0.289	0.711	0.639	0.588	0.000	2.848

Source: Generated by author

APPENDIX H

The Relationship between the Degree of Foreign Ownership, Dividend Yield, and the Associated IMTR

This table depicts the relationship between the degree of foreign ownership defined as the ratio of total supplementary dividends relative to total dividends. DY is dividend yield. IMTR is the estimate of investors' marginal tax rate. Mean is the average. Median is the median of the degree of Foreign Ownership percentage. STD is the standard deviation. Min is the minimum value. Max is the maximum value. Dividend yield is divided into three categories from the lowest to the highest and the average degree of foreign ownership is calculated for each category along with the estimate of the IMTR.

Category	N	DY Mean	IMTR Mean	Degree of Foreign Ownership				
				Mean	Median	STD	Min	Max
1	32	0.017	0.275	0.138	0.176	0.0768	0.000	0.260
2	32	0.026	0.245	0.151	0.176	0.062	0.000	0.269
3	32	0.043	0.165	0.136	0.172	0.067	0.000	0.217
All	96	0.028	0.229	0.142	0.174	0.068	0.000	0.269

The correlation coefficient between dividend yield and the degree of foreign ownership is 0.049 (0.634), and the correlation coefficient between IMTR and the degree of foreign ownership is -0.027 (0.794).

Source: Generated by author

APPENDIX I

Dividend Clientele Split into Three Categories for the Survived Companies

This table depicts the relationship between dividend yield and estimates of investors' personal implied marginal tax rates. N is the number of observations in each category. DY is the average dividend yield. IMTR is the estimate of the investors' implied marginal tax rate. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are the dividends per share. Mean is the average of the Elton and Gruber ratio. Median is the median of the ratio. STD is the standard deviation. Min is the minimum value. Max is the maximum value. Corr. is the correlation coefficient between the dividend yield and the Elton and Gruber ratio.

Panel A: 1989-1993

Category	N	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	15	0.0132	0.2256	0.7744	0.6400	0.6295	0.0000	1.7956
2	15	0.0213	0.4574	0.5426	0.5124	0.3299	0.1250	1.3636
3	15	0.3618	0.3372	0.6628	0.6466	0.5088	0.0000	1.7857
All	45	0.0236	0.3401	0.6599	0.6333	0.5022	0.0000	1.7956

Panel B: 1996-2000

Category	N	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	15	0.0174	0.1546	0.8454	0.7791	0.3827	0.1176	1.4203
2	15	0.0262	0.3781	0.6219	0.6197	0.3356	0.000	1.2923
3	15	0.0426	0.0717	0.9283	0.8676	0.2862	0.5185	1.5000
All	45	0.0287	0.2015	0.7985	0.7692	0.3544	0.0000	1.5000

Source: Generated by author[40]

[40] The data were classified on the basis of seven categories and the results are similar to those of three and five categories. The table is available upon request.

APPENDIX J

Dividend Clientele Split into Five Categories for the Survived Companies

This table depicts the relationship between dividend yield and estimates of investors' personal implied marginal tax rates. N is the number of observations in each category. DY is the average dividend yield. IMTR is the estimate of the investors' implied marginal tax rate. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are the dividends per share. Mean is the average of the Elton and Gruber ratio. Median is the median of the ratio. STD is the standard deviation. Min is the minimum value. Max is the maximum value. Corr. is the correlation coefficient between the dividend yield and the Elton and Gruber ratio.

Panel A: 1989-1993

Category	N	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	9	0.0110	0.0650	0.9350	0.8400	0.7206	0.0000	1.7956
2	9	0.0173	0.4739	0.5261	0.5102	0.3731	0.0000	1.0455
3	9	0.0211	0.4305	0.5695	0.5294	0.3627	0.1373	1.3636
4	9	0.0281	0.5339	0.4661	0.5714	0.3200	0.0000	0.8571
5	9	0.0403	0.1968	0.8032	0.6832	0.5614	0.0000	1.7857
All	45	0.0236	0.3401	0.6599	0.6333	0.5022	0.0000	1.7956

Panel B: 1996-2000

Category	N	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	9	0.0155	0.1265	0.8735	0.7791	0.3728	0.3211	1.3981
2	9	0.0209	0.1693	0.8307	0.9000	0.4005	0.1176	1.4203
3	9	0.0264	0.4198	0.5802	0.5874	0.2713	0.1639	1.0889
4	9	0.0315	0.3009	0.6991	0.7241	0.3309	0.0000	1.2632
5	9	0.0493	-0.0090	1.0090	0.9718	0.2938	0.6154	1.5000
All	45	0.0287	0.2015	0.7985	0.7692	0.3544	0.0000	1.5000

Source: Generated by author[41]

[41] The data were classified on the basis of seven categories and the results are similar to those of three and five categories. The table is available upon request.

APPENDIX K

Leverage Clienteles (LEV1) Split into Three Categories for the Survived Companies

This table depicts the relationship between leverage and estimates of investors' personal implied marginal tax rates. N is the number of observations in each category. LEV1 is the book value of long-term debt divided by book value of long-term debt plus equity. IMTR is the estimate of the investors' implied marginal tax rate. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are dividends per share. Mean is the average of the Elton and Gruber ratio. Median is the median of the ratio. STD is the standard deviation. Min is the minimum value, and Max is the maximum value.

Panel A: 1989-1993

Category	N	LEV1 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	15	0.079	0.215	0.785	0.676	0.534	0.000	1.786
2	15	0.348	0.535	0.465	0.370	0.429	0.000	1.364
3	15	0.539	0.270	0.730	0.639	0.511	0.000	1.796
All	45	0.322	0.340	0.660	0.633	0.502	0.000	1.796

Panel B: 1996-2000

Category	N	LEV1 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	15	0.084	0.188	0.812	0.800	0.403	0.000	1.420
2	15	0.307	0.236	0.764	0.719	0.272	0.164	1.333
3	15	0.509	0.180	0.820	0.779	0.396	0.321	1.500
All	45	0.2995	0.2015	0.7951	0.7692	0.3544	0.0000	1.5000

Source: Generated by author

APPENDIX L

Leverage Clienteles (LEV1) Split into Five Categories for the Survived Companies

This table depicts the relationship between leverage and estimates of investors' personal implied marginal tax rates. N is the number of observations in each category. LEV1 is the book value of long-term debt divided by book value of long-term debt plus equity. IMTR is the estimate of the investors' implied marginal tax rate. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are dividends per share. Mean is the average of the Elton and Gruber ratio. Median is the median of the ratio. STD is the standard deviation. Min is the minimum value, and Max is the maximum value.

Panel A: 1989-1993

Category	N	LEV1 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	9	0.029	0.384	0.616	0.529	0.584	0.000	1.786
2	9	0.192	-0.044	1.044	0.963	0.318	0.676	1.682
3	9	0.349	0.668	0.332	0.243	0.316	0.000	1.000
4	9	0.447	0.637	0.363	0.292	0.312	0.000	0.744
5	9	0.594	0.056	0.944	0.640	0.519	0.506	1.796
All	45	0.322	0.340	0.660	0.633	0.502	0.000	1.796

Panel B: 1996-2000

Category	N	LEV1 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	9	0.018	0.149	0.851	0.868	0.433	0.000	1.420
2	9	0.206	0.252	0.748	0.701	0.341	0.118	1.302
3	9	0.298	0.247	0.753	0.719	0.311	0.164	1.333
4	9	0.428	0.261	0.739	0.779	0.288	0.321	1.263
5	9	0.549	0.097	0.903	0.887	0.427	0.333	1.500
All	45	0.2995	0.2015	0.7951	0.7692	0.3544	0.0000	1.5000

Source: Generated by author

APPENDIX M

Leverage Clienteles (LEV2) Split into Three Categories for the Survived Companies

This table depicts the relationship between leverage and estimates of investors' personal implied marginal tax rates. N is the number of observations in each category. LEV2 is the book value of long-term debt divided by book value of long-term debt plus equity. IMTR is the estimate of the investors' implied marginal tax rate. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are dividends per share. Mean is the average of the Elton and Gruber ratio. Median is the median of the ratio. STD is the standard deviation. Min is the minimum value, and Max is the maximum value.

Panel A: 1989-1993

Category	N	LEV2 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	15	0.268	0.253	0.747	0.763	0.563	0.000	1.786
2	15	0.499	0.418	0.582	0.512	0.453	0.000	1.732
3	15	0.679	0.349	0.651	0.633	0.506	0.000	1.796
All	45	0.482	0.340	0.660	0.633	0.502	0.000	1.796

Panel B: 1996-2000

Category	N	LEV2 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	15	0.121	0.233	0.767	0.699	0.350	0.000	1.420
2	15	0.334	0.302	0.698	0.769	0.317	0.118	1.302
3	15	0.476	0.070	0.930	0.887	0.376	0.321	1.500
All	45	0.3104	0.2015	0.7985	0.7692	0.3544	0.000	1.500

Source: Generated by author

APPENDIX N

Leverage Clienteles (LEV2) Split into Five Categories for the Survived Companies

This table depicts the relationship between leverage and estimates of investors' personal implied marginal tax rates. N is the number of observations in each category. LEV2 is the book value of total liabilities divided by book value of total assets. IMTR is the estimate of the investors' implied marginal tax rate. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are dividends per share. Mean is the average of the Elton and Gruber ratio. Median is the median of the ratio. STD is the standard deviation. Min is the minimum value, and Max is the maximum value.

Panel A: 1989-1993

Category	N	LEV2 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	9	0.202	0.189	0.811	0.840	0.678	0.000	1.786
2	9	0.386	0.393	0.607	0.667	0.306	0.000	1.045
3	9	0.501	0.293	0.707	0.683	0.531	0.125	1.732
4	9	0.597	0.615	0.385	0.512	0.325	0.000	0.857
5	9	0.725	0.211	0.789	0.639	0.560	0.137	1.796
All	45	0.482	0.340	0.660	0.633	0.502	0.000	1.796

Panel B: 1996-2000

Category	N	LEV2 Mean	IMTR Mean	$(P_b-P_a)/DPS$				
				Mean	Median	STD	Min	Max
1	9	0.060	0.248	0.752	0.701	0.377	0.000	1.398
2	9	0.235	0.164	0.836	0.698	0.322	0.500	1.420
3	9	0.339	0.310	0.690	0.769	0.273	0.164	0.995
4	9	0.394	0.226	0.774	0.868	0.453	0.118	1.500
5	9	0.525	0.060	0.940	0.887	0.355	0.417	1.333
All	45	0.3104	0.2015	0.7985	0.7692	0.3544	0.000	1.500

Source: Generated by author

APPENDIX O

Statistics for Joint Clienteles with Different Dividend Yield-Leverage (LEV1) Combinations

Estimates of the implied marginal tax rate (IMTR) for different combinations of dividend yield and leverage as predicted by the joint clienteles hypothesis. LEV1 is measured as long-term debt divided by long-term capital. N is the number of observations in each group. DY is the average dividend yield for each group. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are dividends per share. EGR is the average Elton and Gruber ratio. STD is the standard deviation of EGR. MIN and MAX is the minimum and the maximum values of EGR respectively.

Panel A: 1989-1993

DIVIDEND YIELD	LEVERAGE	N	LEV1 Mean	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
						MEAN	MED	STD	MIN	MAX
1.High Dividend Yield	High Leverage	11	0.504	0.031	0.450	0.550	0.639	0.378	0.000	1.250
2.High Dividend Yield	Low Leverage	11	0.127	0.033	0.312	0.688	0.667	0.499	0.000	1.786
3.Low Dividend Yield	High Leverage	11	0.488	0.017	0.339	0.661	0.510	0.573	0.125	1.796
4.Low Dividend Yield	Low Leverage	12	0.182	0.014	0.266	0.734	0.869	0.579	0.000	1.682

Panel B: 1996-2000

DIVIDEND YIELD	LEVERAGE	N	LEV1 Mean	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
						MEAN	MED	STD	MIN	MAX
1.High Dividend Yield	High Leverage	10	0.486	0.036	0.079	0.921	0.816	0.311	0.519	1.500
2.High Dividend Yield	Low Leverage	12	0.127	0.040	0.219	0.781	0.759	0.324	0.000	1.302
3.Low Dividend Yield	High Leverage	12	0.434	0.021	0.326	0.674	0.599	0.367	0.164	1.292
4.Low Dividend Yield	Low Leverage	11	0.172	0.019	0.158	0.842	0.701	0.407	0.118	1.420

Source: Generated by author

APPENDIX P

Statistics for Joint Clienteles with Different Dividend Yield-Leverage (LEV2) Combinations

Estimates of the implied marginal tax rate (IMTR) for different combinations of dividend yield and leverage as predicted by the joint clienteles hypothesis. LEV1 is measured as long-term debt divided by long-term capital. N is the number of observations in each group. DY is the average dividend yield for each group. P_b is the price before the ex-dividend day. P_a is the price on the ex-dividend day. DPS are dividends per share. EGR is the average Elton and Gruber ratio. STD is the standard deviation of EGR. MIN and MAX is the minimum and the maximum values of EGR respectively.

Panel A: 1989-1993

DIVIDEND YIELD	LEVERAGE	N	LEV2 Mean	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
						MEAN	MED	STD	MIN	MAX
1.High Dividend Yield	High Leverage	11	0.634	0.030	0.490	0.510	0.571	0.386	0.000	1.250
2.High Dividend Yield	Low Leverage	11	0.367	0.035	0.272	0.728	0.676	0.477	0.000	1.786
3.Low Dividend Yield	High Leverage	11	0.645	0.016	0.289	0.711	0.526	0.633	0.000	1.796
4.Low Dividend Yield	Low Leverage	12	0.299	0.015	0.312	0.688	0.675	0.522	0.000	1.682

Panel B: 1996-2000

DIVIDEND YIELD	LEVERAGE	N	LEV2 Mean	DY Mean	IMTR Mean	$(P_b-P_a)/DPS$				
						MEAN	MED	STD	MIN	MAX
1.High Dividend Yield	High Leverage	10	0.468	0.040	0.027	0.973	0.877	0.296	0.519	1.500
2.High Dividend Yield	Low Leverage	12	0.172	0.037	0.262	0.738	0.710	0.308	0.000	1.302
3.Low Dividend Yield	High Leverage	12	0.420	0.020	0.278	0.722	0.645	0.418	0.118	1.333
4.Low Dividend Yield	Low Leverage	11	0.198	0.019	0.210	0.790	0.699	0.368	0.164	1.420

Source: Generated by author

APPENDIX Q

The Correlation Coefficients between the Independent Variables for the Restricted Sample and IMTR Values Greater than Zero but Less than One

BEP is the basic earning power, SIZE is the log of total assets, IMTR is the implied marginal tax rate, LEV is the degree of financial leverage, FINST is the percentage of financial institutional holdings, FINV is the ratio of supplementary dividend to total dividends (proxy for the degree of foreign ownership), STDTA is the standard deviation of operating income standardized by total assets, and GRTH is the annual compound growth rate in total assts.

VARIABLE	BEP	SIZE	IMTR	LEV	FINST	FINV	STDTA	GRTH
TQ	**0.648**	-0.159	-0.074	**-0.476**	0.162	0.067	**0.491**	0.157
	(0.000)	(0.194)	(0.546)	**(0.000)**	(0.187)	(0.586)	**(0.000)**	(0.200)
BEP	1.000	-0.214	-0.125	**-0.440**	0.069	0.120	0.163	0.001
		(0.080)	(0.310)	**(0.000)**	(0.573)	(0.329)	(0.182)	(0.995)
SIZE		1.000	-0.208	**0.501**	**0.489**	-0.074	-0.258	-0.027
			(0.089)	**(0.000)**	**(0.000)**	(0.547)	(0.028)	(0.825)
IMTR			1.000	-0.048	-0.094	-0.113	-0.141	0.038
				(0.693)	(0.444)	(0.359)	(0.252)	(0.757)
LEV				1.000	0.146	-0.156	-0.238	0.089
					(0.235)	(0.204)	(0.051)	(0.471)
FINST					1.000	0.041	-0.006	0.132
						(0.740)	(0.959)	(0.283)
FINV						1.000	-0.169	0.053
							(0.169)	(0.669)
STDTA							1.000	-0.078
								(0.527)

Source: Generated by author

APPENDIX R

Results of Multiple Regression Analysis for the Restricted Sample without Outliers and IMTR Values Greater than Zero but less than One

Results of the cross-sectional analysis for different models where the IMTR does not include values greater less than zero or 100 percent. INTER. is the intercept, TQ is Tobin's q ratio, BEP is the basic earning power, SIZE is the log of total assets, IMTR is the implied marginal tax rate, LEV is a measure of financial leverage, FINST is the percentage of financial institutional holdings, FINV is a proxy of foreign investors, STDTA is the standard deviation of earnings standardized by total assets, GRTH is the compound growth rate in total assets, RSQR is the r-square, and ARSQR is the adjusted r-square.

N0	INTER.	TQ	BEP	SIZE	IMTR	LEV	FINST	FINV	STDTA	GRTH	F-VALE	RSQR	ARSQR
1	4.591	-0.276	4.682	-0.301	-0.009	0.009	-0.008	0.025	0.007	-0.011	2.63**	0.290	0.180
	(4.57)***	(-2.02)**	(1.37)	(-2.15)**	(-1.27)	(0.77)	(-0.08)	(1.05)	(0.22)	(-0.92)			
2	5.156	-0.203	-	-0.295	-0.011	-	-0.008	0.024	-	-0.012	3.59***	0.261	0.188
	(6.21)***	(-2.44)**		(-2.54)**	(-1.58)		(-0.73)	(1.05)		(-1.06)			
3	5.135	-	-1.023	-0.287	-0.011	-	-0.011	0.016	-0.031	-0.017	2.29**	0.211	0.119
	(5.05)***		(-0.39)	(-2.21)**	(-1.55)		(-0.99)	(0.67)	(-1.21)	(-1.44)			
4	5.370	-0.210	-	-0.346	-0.011	-	-	0.023	-0.006	-0.013	3.48***	0.255	0.182
	(6.13)***	(-2.24)**		(-3.35)***	(-1.61)			(0.37)	(-0.20)	(-1.17)**			
5	3.420	-0.173	-	-	-0.006	-	-0.021	0.033	-0.0156	-0.009	2.34***	0.187	0.107
	(6.07)***	(-1.75)*			(-0.90)		(-2.27)**	(1.39)	(-0.55)	(-0.78)			
6	3.22	-	-	-	-0.006	0.004	-0.025	0.028	-0.008	-0.014	1.77	0.149	0.065
	(4.89)***				(-0.88)	(0.39)	(-2.56)***	(1.15)	(-0.30)	(-1.15)			

*** Indicates significance at one percent level.

** Indicates significance at five percent level.

* Indicates significance at 10 percent level.

Source: Generated by author