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ESSAYS IN DIVIDENDS – CANADIAN EXPERIENCE

By

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**A thesis submitted to the
Faculty of Public Affairs and Management
in partial fulfillment of the requirements of the degree of
Doctor of Philosophy in Management**

**Eric Sprott School of Business
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Ottawa, Ontario**

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ABSTRACT

The proportion of dividend paying Canadian firms falls from 54.01% in 1987 to 23.08% in 2001 due partly to the substitution of share repurchases for dividends, which validates the hypothesis that dividends have been disappearing. Indeed, the proportion of share repurchases to total payout of firms with positive earnings increase from 3.68% in 1987 to 22.25% in 2001. An examination of the characteristics of the firms that use share repurchases only reveal that these firms tend to have high earnings volatility, high leverage and negative earnings, further supporting the substitution hypothesis. In addition, this study confirms for the first time in the finance literature that liquidity plays an important role in dividend payment decisions. Using the mean rank liquidity index classification system, this study documents a positive relationship between liquidity and dividend expenditure, with coefficient estimate of 0.15 and t-statistic of 11.075. The study further confirms for the first time that least constrained firms are more sensitive to liquidity when making dividend payment decisions than severely constrained firms. Tobit analysis also confirms that liquidity remains the most statistically significant variable that explains dividend payout ratios in Canada, with coefficient estimate of 0.2022 and p-value of $<.0001$, although other variables such as foreign control, return on assets, size, net profit ratio and share price play residual role in explaining dividends.

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1.0 INTRODUCTION

Corporate dividend payout policy is experiencing noticeable changes in recent times. The U.S. evidence indicates that, in recent years, cash dividends to shareholders have started to diminish at an alarming rate, while concurrently, share repurchase activities have continued to grow (Fama and French, 2001). This is in spite of the fact that firms had traditionally used dividends as a primary payout approach to stockholders and there has been no dramatic change in the differential tax rates between dividends and capital gains.¹ Evidence from this study indicates that dividends paid by the listed and delisted Canadian firms have been disappearing at an increasing rate. In 1987 the proportion of dividend paying Canadian firms was 54.01% and, by 2001, that proportion had declined precipitously to 23.08%.

While dividend payout ratios and dividend yields have shown significant decline over the past three decades, share repurchase activities have shown tremendous growth. Grullon and Michaely (2002) report that expenditure on share repurchase programs in the U.S. relative to total earnings increased from 4.8% in 1980 to 41.8% in 2000. In 1999 and 2000 alone, industrial firms in the U.S. spent more money on share repurchases than on dividend payments partly due to the effect of taxation and Securities Exchange Commission (“SEC”) reforms on share repurchasing. The Canadian evidence is consistent with the U.S.

¹ The recently approved proposal by President Bush for eliminating double taxation of dividends, which took effect in May 2003, may prove to be one of the most significant changes to the tax treatment of dividends in the U.S. It is further noted that Julio and Ikenberry (2004) have recently documented that, after reaching a low of 16% in 2001, the percentage of dividend payers in the U.S. appears to rise again, and by the first quarter of 2004, over 20% of U.S. Industrials have been paying dividends. Although this evidence may be a brief upturn and may in no way suggest a long-term upward trend, the authors ascribe this observation to a number of plausible reasons, prominent among them, being the effect of the Bush tax cut, and the use of dividends by large corporations as a way of reassuring investors about the “quality” of their earnings.

experience. Median dividend yield generally declined from 3.72% in 1990 to 2.27% by 2001 (1.75% in 1997), while median dividend payout ratio declined from 58.2% in 1991 to 34.13% by 2001. Over the period from 1987 to 2001, share repurchases expenditure as a proportion of total payout increased from 3.68% to 33.30%.

Although the above factual findings of the declining dividend and increasing share repurchases appears homogenous in the existing literature, the rationale for this peculiar phenomenon is far from consistent. Fama and French (2001) have suggested two explanations for the declining cash dividends. The first observed explanation for the declining dividend is the changing characteristics of publicly traded firms. Fama and French (2001) observed that the population of publicly traded firms tilts increasingly towards small firms with low profitability and strong growth opportunities, which are characteristics of firms that tend not to pay dividends. Their more striking finding is that, regardless of the firms' characteristics, they tend to have low propensity to pay dividends, implying that the perceived benefits of dividend have declined through time. The authors suggest that the declining propensity to pay indicates that firms have become aware of the tax disadvantage of dividends. Another reasons proposed is the larger holdings of stock options by managers who prefer capital gains to dividends. Grullon and Michaely (2002) have ascribed the dividend disappearance phenomenon to the substitution by share repurchase activity. The empirical evidence from their paper suggests that the marked increase in share repurchase activity in the U.S. has been financed with potential increases in dividend.

Evidence from DeAngelo, DeAngelo & Skinner (2000) suggests that dividends are a useful signaling mechanism only when they send messages to shareholders. They argue that because most firms paid special dividends² almost as predictably as they paid regular dividends, the two were perceived as close substitutes and thus impeded their ability to convey different messages to the market, hence the decline in the use of special dividends as a signaling mechanism. DeAngelo, DeAngelo & Skinner (2000) further argue that the decline in the use of special dividends is related to the shift in clientele from the mid-century era in which stock ownership was dominated by individual investors to the current era in which institutions dominate. This clientele shift has reduced the importance of special dividends since institutions are presumably more sophisticated than retail investors and are therefore able to see that most firms treated specials as close substitutes for regulars. DeAngelo, DeAngelo & Skinner (2000) however, find little support for the notion that special dividends were displaced by share repurchases.

² There is a rich body of literature on special dividends although the predominant objective of the research has been to explain the information content of their announcements. Brickley (1983) concludes that although regular and special dividends represent cash disbursements to shareholders with identical tax consequences, the market reacts differently to both. The market reaction to special dividend and regular dividend increases indicates that regular dividends convey more positive information than special dividends. Brickley also concludes that management uses special dividend announcements to convey information to the market about future dividends and earnings. Jayaraman and Shastri (1988) observe that the market reacts positively to special dividends but it does not lead to wealth transfer away from stockholders, and that the frequent declaration of special dividends conveys less information than infrequent declarations. Kaestner and Liu (1998) observe a positive support of special dividend announcements to the cash flow signaling hypothesis while Gelb (1999) concludes that the choice of stock repurchases versus special dividends as a one-time cash distribution is related to the level of a firm's accounting disclosures. The results of this study suggest that firms providing more informative accounting disclosures are more likely to announce stock repurchases as a means for one-time cash distribution while firms providing less informative accounting disclosures tend to rely on special dividends for one-time cash distribution. These findings are consistent with prior studies that argue that information costs associated with stock repurchases limit their use as a payout method.

There is also an apparent incentive for firms to shift from dividends to share repurchases³ because capital gains are taxed more favorably than dividend income. Hence, an explanation advanced for the growth in share repurchase is that managers may be taking into consideration shareholders' tax status when deciding whether to use dividends or share repurchases as the payout policy.

It has also be argued that the magnitude of dividend payout is negatively correlated with the magnitude of stock option plans and that share repurchases are positively related to the magnitude of stock option plan⁴. Hence, a residual reason for the growth in the use of share repurchase may be to satisfy corporate stock option requirements.

³ It is also important to investigate whether dividends and share repurchases are indirect payout policy substitutes and whether there is empirical evidence of the relationship between them. Research on total payout policies, such as Miller and Rock (1985) or Bhattacharya (1979), makes no distinction between dividends and share repurchase, implying that dividends and share repurchases may be payout policy substitutes. There are other studies that depend on differential taxation, such as John and Williams (1985). These studies may imply that share repurchases and dividends are separate and distinct payout policies. It has also been argued that while both dividends and share repurchases remove excess cash from the reach of management, share repurchases creates no binding commitment on management. This is because, management may use share repurchases to create temporary financial flexibility such as improvement in earnings per share to reduce the total outstanding shares. Moreover, management has a lot more incentive to repurchase shares than to pay more dividends as a result of the proliferation of stock options to minimize share dilution as stock options are exercised. Grullon and Michaelley (2002) have established a negative correlation between the dividend forecast error and share repurchase activity which may indicate that share repurchases have been partly financed with potential dividend increases. This implies that as firms repurchase more shares, the actual dividend paid becomes lower than the expected dividend. While the results of this study does not validate whether share repurchases and dividends are policy substitutes, it nevertheless provides some empirical support to the notion that the decline in dividends may well be the effect of the growth in share repurchase activity. Finally, Jagannathan, Stephens and Weisbach (2000) found that firms that repurchased their shares tend to have higher variability of operating income relative to firms that only increased dividends. The empirical implication is that firms that experience higher cash flow variability tend to use repurchases while firms with lower cash flow variability tend to use dividends.

⁴ It is equally important to highlight some of the research findings on the role stock options plays in the payout decisions of firms. Fenn and Liang (2001) have observed a negative relationship between stock option plans and dividends. In a sample of 1,100 firms for the period 1993 to 1997, they reported that dividend payouts were negatively correlated with the magnitude of the stock option plan and that share repurchase payout were positively related to the magnitude of the stock option plan. Total payout was also observed to be negatively related to the magnitude of stock option plan. Jolls (1998) reported a positive relationship between share repurchase decision and the magnitude of executive stock option plan, while Weisbenner (2000) found that the larger the executive holding of stock options, the more likely the firm is to reduce dividends and to retain more of its earnings. These studies therefore establish a linkage between executive

The results from the study of dividend and share repurchase patterns of Canadian firms indicate that during the period from 1987 to 2001 when dividends were disappearing, share repurchase expenditures kept increasing. The gaining of prominence of share repurchases as an alternative payout option in Canada is supported by the increase in the proportion of share repurchase to total payout (share repurchase expenditure and dividend payments) from 3.72% in 1991 to 33.04% in 2001 (42.73% in 1996). Over the same period, the proportion of dividends to total payout declined from 96.28% to 66.96%. Moreover, for firms with negative earnings, the proportion of share repurchases to total payout increased from 0.95% in 1987 to 73.94% in 2001, while with respect to firms with positive earnings, the proportion of share repurchases to total payout increased from 3.68% in 1987 to 22.25% in 2001 (33.30% in 2000).

An examination of the characteristics of firms that use share repurchases only compared to those that use dividends and share repurchases reveal that firms using share repurchases only tend to have high earnings volatility, have larger leverage and negative return on assets, thus supporting the substitution hypothesis proposed by

compensation and the method of payout. As stock option programs increase, firms tend to use more repurchases and reduce retained earnings and when top management hold more of stock options, dividends tends to diminish. Jong, Dijk and Veld (2003) also confirmed that dividend payments are significant and negatively related to managerial option plan, and that companies that have managerial option plans are less likely to pay dividends. This observation was in line with their expectation since most managerial option plans are not dividend protected. Murphy (1998) observed that only 1.1% of stock option plans in the U.S. were dividend protected. This means that dividends decrease the value of stock option plans, hence, creating the incentive for management to reduce dividend payments in order to increase the value of their stock options. Dittmar (2000) also found that firms with large amounts of shares held to satisfy employee and management stock options are more likely to engage in share repurchases.

Grullon and Michaely (2002). Additionally, the consistent decline in dividend yield⁵ between 1987 to 2001 and the simultaneous and consistent increase in share repurchase yield over the same period, regardless of whether the sample is just firms with positive earnings only, or firms with negative earnings alone, further supports the hypothesis that share repurchases have been substituting for dividends in Canada.

Furthermore, this study has confirmed for the first time that liquidity plays an important role in the dividend payment decisions of Canadian firms. Based on mean rank liquidity index classification system, this study has concluded that there exists a significant and positive relationship between liquidity and dividend expenditure with a beta estimate of 0.15 and t-statistic of 11.075. Besides, this study has established that least constrained Canadian firms are more sensitive to liquidity when making dividend payment decisions than severely constrained firms.

Finally, from cross-sectional and time-series multiple regression analyses, this study has also documented statistically significant impact of various key variables that explain dividend payment decisions in Canadian firms. From the performance-based variables, Liquidity appears to be the key explanatory variable for dividend decisions, with a t-statistic of 8.863 and a standardized coefficient estimate of 0.243. Return on Assets, as a performance-based variable, is also significant and negatively related to dividend payment decision with a t-statistic of -1.908, and a standardized coefficient estimate of -0.055. Among the characteristics-based variables, domestic-foreign control has the most

⁵ Share repurchase yield as used here is measured by the percentage of total share repurchase expenditure to total market value of shares while dividend yield is measure by the percentage of total dividend expenditure

statistically significant positive effect on dividend decisions, with a t-statistic of 2.619 and a standardized coefficient estimate of 0.073. Size is also statistically significant, and negatively related to dividend decisions with a t-statistic of -2.127 and a standardized coefficient estimate of -0.066. The results from the Tobit analysis also confirm that liquidity remains the most statistically significant variable that explains dividend payout ratios in Canadian firms. The implication of the foregoing is that the disappearance of dividends is partially explained by the changing liquidity situation of the firm, as further evidenced by the heavy turnover of firms with respect to their liquidity index values and the inverse relationship established between the sensitivity of dividend payment behavior of firms and their liquidity constraint situation.

In conclusion, it is important to reiterate that the formally documented decline in dividend payers and the rise in share repurchase activities during the same period of study from 1987 to 2001 may indicate an apparent shift in payout policies of Canadian firms. In addition, the empirical discovery that least-constrained Canadian firms are significantly more sensitive to liquidity than severely-constrained firms, underscores the important role liquidity plays in dividend payout decisions. Finally, the performance, valuation and characteristics-based variables that exhibited statistically significant impact on dividend payment decisions based on the multiple regression results and the Tobit analysis, may play a useful role in dividend-based portfolio construction, asset allocation and rebalancing decisions of mutual funds and investment firms.

to total market value.

1.1 Purpose of the study

Current research points to the fact that dividends are being paid by fewer and fewer firms. However, the question of whether this observed phenomenon is a decline in dividend yield or dividend payout has not been fully resolved in the literature, and it is unclear whether the decline in dividends is the direct result of the growth in share repurchases. There is also sufficient empirical evidence to suggest that liquidity constraint directly impacts the firm's investment decisions and, by intuition, its dividend payout policy. However, the impact of liquidity on payout policy is not fully researched. This study sets out to investigate several dividend policy issues in the Canadian context, with the view to improving understanding of corporate payout behavior. The focus of the study on Canada would provide important contribution to the literature in this domain, because the corporate payout literature is dominated by U.S. studies and that Canada is the only country that can corroborate or contradict the results of the U.S. studies.

Section two of the study explores the theoretical underpinnings of dividend policy, reviews the empirical justification of the various departures from the Modigliani and Miller (M&M) irrelevance proposition, and outlines the current literature on liquidity constraint and its effects on dividend policy. The major changes in Canadian tax laws during the sample period that had impact on the differential tax rate between capital gains tax and dividend tax are also documented, for the purpose of exploring their role in the choice among the payout options. This section also summarizes findings from the literature on whether dividends and share repurchases are indirect payout policy substitutes.

Section three of the study outlines the research themes and highlights the specific research hypotheses to be tested. The liquidity constraint classification system and various research methodologies are explained and tested to validate their efficacy. Statistical significance tests necessary to validate the hypotheses are also explained and tested. Finally, the methodology for selecting the set of matching firms to facilitate the comparison of dividend payment and share repurchase expenditure patterns is also discussed.

Section four of the study describes the data set used and time frame for analysis and investigates the specific hypotheses. This section reports the time trends in dividends in Canada, documents the disappearance of dividends and the growth in the use of share repurchases, and identifies the unique characteristics that explain this phenomenon. This section also documents the impact on dividend and share repurchase patterns of several key corporate finance issues such as dual class share structure, size of the firm, domestic-foreign control, over or under investing, liquidity constraint, and the impact of tax policy changes. This section also investigates the joint impact of various variables on dividend and share repurchase expenditure decisions in Canadian firms by using multiple regression modeling. Some of the variables influencing dividend and share repurchase decisions are performance-based, while others are valuation-based and the remaining variable being reflective of the relatively permanent characteristics of the firm in question. To address the effects of censoring of data, a Tobit analysis is also implemented based on a regression model for left censored data with assumption of normal distribution of the error term.

Section five summarizes the key findings, provides a conclusion, outlines the major implications of the results and offers recommendations for future research.

To further clarify the objective of this study, note the following. Firstly, this study is not about information content of dividend announcements. Secondly, this study does not address the implication of tax regime changes on dividend policy at the micro level, although the tax changes affecting capital gains and dividends will be documented. On the contrary, this study investigates, at the macro level, the extent to which the high inclusion rate of capital gains may have influenced share repurchase activity in Canada. Thirdly, this study does not discuss ex-dividend day changes to price and implications for marginal tax rate. Lastly, this study does not address the valuation implications of dividend changes.

2.0 LITERATURE ON DIVIDEND POLICY

2.1 Theoretical perspective

The foundation of dividend policy debate is credited to the seminal paper by Miller and Modigliani ("M&M") in 1961. Miller and Modigliani (1961) proposed that given a firm's investment policy, the dividend payout policy it chooses to follow would affect neither the current price of its shares nor the total return to its shareholders. This important conclusion is premised on the observation that current dividends can influence the value of the firm directly via the total dividends paid out and inversely via the value of new shares sold to outsiders during a given period. The authors argue that under perfect market conditions, these two effects cancel out leaving the value of the firm or the price of its shares unaffected by the current dividend decision.

While financial economists have been pre-occupied trying to explain whether the Miller and Modigliani (1961) dividend-policy irrelevance proposition is supported by empirical evidence or not, corporations have in the mean time continued to pay dividends. In 2001, Eugene Fama and Kenneth French noted:

Dividends have long been an enigma. Since they are taxed at a higher rate than capital gains, the common presumption is that dividends are less valuable than capital gains. In this view, firms that pay dividends are at a competitive disadvantage since they have higher cost of equity than firms that do not pay. The fact that many firms pay dividends is then difficult to explain

From the M&M dividend policy irrelevance proposition, three major departures are evident in the literature. The tax clientele hypothesis is the first deviation from the dividend irrelevancy argument as a result of the existence of differential treatment of dividends and capital gains at the hand of the investor as well as the existence of taxable and non-taxable investors, in accordance with Miller & Modigliani (1961). Miller and Modigliani conceded that the introduction of taxation into the irrelevancy argument has the tendency to produce different investor clientele with different preference for capital gains or dividend payouts depending on the tax bracket they fall in.

The second departure from the dividend irrelevance argument is the information asymmetry and signaling hypothesis introduced by Bhattacharyya (1979). The principal argument is that dividend policy is relevant because managers use dividends as a mechanism to signal private information to the market. An offshoot of the signaling debate is the introduction of share repurchases as a tax preferred signal. While share repurchases is on the ascendancy, the gradual decline in dividend payout recently confirmed by research may suggest that the decline in dividends may be directly related to the rise in share repurchases. It is also an empirical fact that while dividends and share repurchases are both signaling mechanisms at the disposal of management, the former is often associated with heavier tax burden than the latter because share repurchases attract capital gains tax which tends to be lower than dividend tax. Bernheim and Wantz (1995) equally argue that dividends would have no information effect if it were not for the higher tax rates they impose on shareholders. They found a significantly negative coefficient between change in dividend signal and relative tax burden on dividend income. One of the major

observations of their study was that tax policy makes dividends relatively more attractive than repurchases as signaling device.

The third departure from the dividend irrelevance argument is the agency and free cash flow hypothesis proposed by Easterbrook (1984) and further articulated by Jensen (1986). The main proposition is that dividend is used by shareholders as a mechanism for reducing over-investment by managers. Dividends reduce the free cash flow that would otherwise have been spent by managers on negative-net-present-value investments. By paying dividends, managers are forced to approach capital markets for new investments, which impose extra discipline and reduces the cost of monitoring management⁶. It must be noted that Jensen (1986) did not address the dividend issue directly in his paper. Besides, no explicit models were proposed by Easterbrook or Jensen to explain the agency hypothesis. Bhattacharyya (1998) formally models dividends in a principal-agent paradigm. The model

⁶ There exist in the finance literature extensive work on corporate governance issues such as corporate board composition, ownership structures, executive compensation and potential expropriations, and some of the key papers in this domain are summarized below. Jog and Schaller (1989) summarized the alternative mechanisms for controlling agency costs including the institution of one-share-one-vote rule, alignment of management compensation schemes, operationally efficient labor market for managerial services, external monitors such as securities regulators, monitoring by large shareholder blocks, efficient board systems and an active market for corporate control. Morck, Schleifer and Vishny (1988) suggested that boards of directors in Fortune 500 firms, are on average, not captive to incumbent management and are able to ensure disciplined management that acts in the best interest of shareholders. Jensen and Ruback (1983) also argued that the threat of potential takeover with the possibility of incumbent management team losing their jobs may force management to act in the best interest of shareholders and deter managers from running the firm below its performance potential. Stulz (1988) argued that more equity ownership by managers may increase corporate performance because the managers are more capable of opposing a takeover threat from the market for corporate control. Hart and Holmstrom (1987) also argued that remuneration system that correlate the management's salary with financial performance may motivate them to increase financial performance. Fama (1980) documented that the presence of a well functioning market for management services may deter managers from running the firm below its performance potential since that would make it more likely that they would lose their jobs to other and more performance dedicated managers. Shleifer and Vishny (1997) also observed that large owners or block owners may be more capable of monitoring and controlling the management leading to improvement in corporate performance. Erickson, Park, Reising and Shin (2003) however, observed that greater board independence does not have a positive influence on firm value, although their results confirmed that directors from financial institutions can provide monitoring benefits. Hermalin and Weisbach (1991), Mehran (1995) reported an insignificant relationship between board independence and accounting performance.

assumes that the manager wants to maximize his net wealth, and the principal recognizes this and sets a screening contract (i.e., wage contract) to use the skill of the agent in the productive enterprise. The major conclusion of this model is that, contrary to the findings of the dividend models based on signaling, dividend increases conditioned on earnings (i.e., controlling for earnings) is bad news (i.e., a negative information signal). That is, for a given level of earnings, the lower quality manager declares a higher dividend than that declared by a manager with higher productivity. This conclusion is intuitive because the higher quality manager has higher productivity, and therefore it makes sense for the principal to allow that manager to make higher investment and thus pay lower dividends.

The three departures from the original M&M proposition of dividend policy irrelevance and the contributions by researchers to their further advancement are laid out in Appendix A in the appendix section of this study.

There are two major observations that can be deduced from the afore-mentioned empirical literature review. Firstly, the tax regime of a country in question may influence the kind of payout policies firms operating in that country adopt, and depending on the marginal tax rate, investors may prefer capital gains, resulting from share repurchases, to dividend payments. Secondly, the payout policy of a firm may directly impact its ability to finance investments from internal funds and, depending on the information asymmetry facing the firm in question, may affect its capacity to access external financing. The foregoing observations will partly form the foundation of some of the key empirical assessments in this study.

2.2 Canadian dividends and capital gains tax regime

One of the objectives of this segment of the study is to document the major changes in Canadian tax laws during the sample period of study that may have an impact on differential tax rate between dividends and capital gains, and to contrast it with the experience in the United States of America. As discussed in the first departure from the dividend irrelevancy argument, taxation has the tendency to produce diverse investor clientele with different preference for capital gains or dividends depending on their marginal tax rate. Hence, from the foregoing, taxation may have a role in explaining the payout options and trends in Canada.

Table 1 outlines the significant changes in the tax laws in Canada and its impact on capital gains tax and dividend tax over the period from 1971 to 2001.

Table 1: Significant changes in tax laws in Canada

Canada	Capital Gains Tax	Dividend Tax
1971 Act	The Canadian Income Tax Act of 1971 introduced for the first time the inclusion of one-half (50%) of capital gains/losses in income for the purpose of assessing corporate or personal tax liability, and is considered to be one of the most significant pieces of that reform package	The Canadian Income Tax Act of 1971 proposed that cash dividend received be grossed-up by one-third (33.33%) and a provision of credit on one-third (33.33%) of the grossed-up amount be allowed to the claimant. The gross-up essentially represents the tax paid by corporations, and the credit is a refund of this tax to the individual.
1977 Budget	None	The gross-up rate was increased from 1/3 (33.33%) to 1/2 (50.00%), and the tax credit rate was increased from 1/3 (33.33%) to 1/2 (50.00%), respectively.
1981 Budget	None	The federal dividend tax credit was reduced from 37.5% to 34% such that with the addition of the provincial credit, the combined credit will average the 1/2 (50%) intended under the system.
1986 Budget	None	Effective 1 January 1987, dividend gross-up and dividend tax credit were reduced

		from ½ (50%) to 1/3 (33.33%), respectively of the amount of dividend received by individuals from taxable Canadian corporations.
1987 Budget	Income tax reform in 1987 increased the inclusion rate for capital gains from one-half (50%) to three-quarters (75%).	
1988 Budget	None	The gross-up rate was reduced from 1/3 (33.33%) to ¼ (25.00%), and the tax credit rate was reduced from 1/3 (33.33%) to ¼ (25.00%), respectively of the amount of dividend received by individuals from taxable Canadian corporations.
Feb 28, 2000 Budget	Reduced the capital gains inclusion rate from three-quarters (75%) to two-thirds (66.67%)	None
Oct 18, 2000 Budget Update	Capital gains inclusion rate further reduced from two-thirds (66.67%) to one-half (50%).	None
2001 Budget	None	None

Table 1 clearly shows that between 1971 to October 2000, the capital gains inclusion rate remained at 50% except for the thirteen-year period from 1988 to 2000, during which the inclusion rate was at 75%. Thus, other than the duration from 1988 to 2000 when the effective capital gains tax rate was about 31%, the rate has remained at about 21%⁷ for the rest of the period in question. On the contrary, the dividend gross-up and credit was rather erratic, changing from about 33% in 1971 to 50% in 1977 to 33% in 1986 and finally to 25% in 1988, and remaining at 25% up to the present. Thus, over the period from 1971 to 2001, the effective dividend tax rate has been at a maximum of about 50% of the dividend received and at a minimum of about 25%⁸. It is reasonable to conclude, based on table 1,

⁷ Capital Gains Tax Computation for year 2001

Capital gains received = \$ 5,000
Federal income tax $(0.26 * 0.50 * 5,000) = \650
Ontario tax $(0.58 * 650) = \$377$
Total tax = $\$650 + \$377 = \$1,027$
Capital gains after taxes = $5000 - 1,027 = \$3,973$
Effective tax rate on capital gains = $\$1,027 / \$5,000 = 20.54\%$

⁸ Dividend Tax Computation for year 2001

Dividends received = \$5,000
Gross-up at 25% = \$1,250

that with the exception of the period from 1988 to 2000, when the effective capital gains tax was higher than the effective dividend tax (i.e., 31% versus 25%), the effective dividend tax has tended to be higher than the effective capital gains tax.

Table 2, on the other hand, shows that the top tax rate on capital gains in the U.S. declined from 28% to 20% in 1981, was subsequently increased to 28% in 1986, and finally decreased to 20% in 1997.

Table 2: Significant changes in capital gains tax laws in the United States

Period/Legislation in the U.S.	Capital Gains Tax
The Economic Recovery Tax Act of 1981	The Act reduced the top tax rate on long-term capital gains for individuals from 28% to 20%.
1986 Tax Reform Act	The Act raised the top marginal tax rate on long-term capital gains (assets held for more than one year) from 20% to 28%.
1997 Taxpayer Relief Act.	The Act reduced the maximum tax rate on the net capital gain for individuals from 28% to 20%.

The first observation from tables 1 and 2 is that, capital gains tax has tended to be higher in Canada than in the U.S. over the period of the review⁹.

Taxable dividend = \$5,000 + \$1,250 = \$6,250
 Federal income tax (0.26 * \$6,250) = \$1,625
 Dividend tax credit (0.1333 * 6,250) = \$833
 Federal tax payable = \$1,625 - \$833 = \$792
 Ontario tax (0.58 * \$792) = \$459
 Total tax = \$792 + \$459 = \$1,251
 Dividends after taxes = \$5,000 - \$1,251 = \$3,750
 Effective tax rate on dividends = 25.02%

⁹ Indeed at the end of 2001, the federal-provincial corporate tax rate was 41.5% in Canada and 40% in the U.S. However, as a result of the 2002 budget pronouncements, it was expected that by 2005 Canada's corporate tax would be 34.6% compared to 40% in the U.S, which is 5.4% below the U.S.

The second observation is that the tax differential between dividends and capital gains in Canada over the period of study is within 5% to 7%, which is relatively small and may not facilitate a meaningful investigation of the differential tax implications on payout policy choices over the sample period. However, it may be useful, where data permits, to explore the effect of the increase in the capital gains inclusion rate to 75% on the magnitude of share repurchases activity for the period 1988 to 2001 in comparison with the period prior to 1988.

2.3 Liquidity constraint

As evident from the theoretical hypotheses described above, one central theme in the firm's setting of dividend policy is its ability to raise external financing as and when needed. However, some recent literature indicates that not all firms have equal access to external capital. The objective of the ensuing discussion is not to highlight the merits of the different measures of liquidity constraint but to examine whether the liquidity situation of firms can partially explain changes in dividend payout over time in Canada.

Under the liquidity constraint hypothesis, firms are said to be financially constrained if they face a wedge between the internal and external costs of funds, and firms are considered more financially constrained as the wedge between their internal and external cost of funds increases. Research in this domain of the literature has provided some empirical justification of the sensitivity of investment decisions to the liquidity situation of the firm in question. If liquidity is crucial in investment decisions, then by intuitive linkage, the diminishing dividend phenomenon may well be a function of the extent to which the firm is liquidity-constrained. Dividend payments involve the use of liquid resources which directly impact the ability of the firm to finance investment from internal resources and, depending on the nature of information asymmetry, may affect the ability of the firm to secure external resources to finance the available investment opportunity.

Recent research has however, concluded that market imperfections are the result of asymmetric information, which create a wedge, that is to say, a finance-constraint between the costs of internal and external financing and therefore influence the Modigliani-Miller

separability of investment and financing decisions. The presence of market imperfections also influences the Miller-Modigliani dividend policy irrelevancy argument. Thus, under asymmetric information situation, investment spending of firms should be directly impacted by their liquidity. Besides, financing of investment could be achieved from internal or external resources, the former directly affecting the size of corporate payouts, and hence implying that liquidity constraint do impact a firm's decision to pay cash dividend.

Fazzari, Hubbard and Peterson ("FHP") (1988) were the first to note that liquidity-constrained firms are not in a position to pay out substantial dividends, and that if firms are classified on the basis of their payout behavior, firms that pay low dividends over many years are more likely to be liquidity constrained. That is to say, low-payout firms are more finance-constrained than high-payout firms. As proposed by Schaller (1993), for firms with relatively poor investment opportunities, a small improvement in investment prospects would lead to an increase in retention and reduction in dividends. At the same time, firms with better investment opportunities would increase investment spending and dividends as a result of increases in cash flow. Schaller (1993) further argues that firms with better investment opportunities do not necessarily depend heavily on external financing for their investments due to liquidity constraint resulting from asymmetric information. Chirinko and Schaller (1995) additionally confirm that liquidity matters in investment decisions. They find evidence that the investment spending of mature firms are less finance-constrained than that of young firms. Jog and Schaller (1994) have also concluded that firms that face liquidity constraints will typically be more reluctant to pay dividends, since

dividends directly reduce the resources available for investment. Jagannathan, Stephens and Weisbach (2000) have also hypothesized that dividends represent an ongoing commitment and are used to distribute permanent cash flows, while repurchases are used to pay out cash flows that are potentially temporary. Repurchases thus preserve financial flexibility relative to dividends because they do not implicitly commit the firm to future payouts. The conclusion that can be drawn from Jagannathan, Stephens and Weisbach (2000) is that firms have introduced share repurchases as an alternative to dividend payment since the former is more responsive to potential future liquidity constraints than the latter.

The implication of the concept of liquidity constraint is that a higher cost of raising external funds suggests a higher opportunity cost of dividends, so that dividends are more costly when funds are needed internally for investment purpose. Moreover, while cash flow for investment purpose tends to be multi-period in nature, dividend payment policy tends to be relatively permanent, although share repurchase policy tends to be temporary in nature. Hence, part of the reasons for the apparent switch from dividends to share repurchases is the liquidity flexibility the use of share repurchases affords the firm as it perceives greater future liquidity constraint. It is therefore conceivable that improvement in investment opportunities has the potential to diminish dividend payouts of firms who have previously been overinvesting since the perceived liquidity constraint of such firms would tend to be greater.

In recent years, however, there have been debates on the interpretation of cash flow coefficients in investment equations as measures of liquidity constraint. Kaplan and Zingales (1997) contend that investment-cash flow sensitivities do not provide useful measures of financing constraints. In their study, they observe that firms classified as less financially constrained exhibit greater investment-cash flow sensitivities than those firms classified as more financially constrained. The authors therefore conclude that a greater sensitivity of investment to cash flow is not a reliable measure of the differential cost between internal and external finance. Cleary (1999) examines the sensitivity of firm investment decisions to liquidity status using data of 1,317 U.S. firms from the 1988 to 1994. Firstly, the author concludes that investment decisions of all firms within the sample are very sensitive to firm liquidity. Secondly, investment decisions of firms with high creditworthiness are extremely sensitive to the availability of internal funds, while less creditworthy firms are much less sensitive to internal fund availability. Thus, similar to the Kaplan and Zingales (1997) results, firms that are more creditworthy exhibit greater investment-liquidity sensitivity¹⁰ than those classified as less creditworthy. A puzzling implication of this finding is that managers may choose to rely primarily on internal cash flow for investment, despite the availability of additional low cost external funds.

¹⁰ Fazzari, Hubbard and Peterson (2000) have argued that the Kaplan-Zingales theoretical model fails to capture the approach of most previous research, making the theoretical analysis irrelevant as a criticism of the Fazzari-Hubbard-Peterson model. Secondly, their use of 49 low-dividend firms is criticized as a poor choice for such a study because the selected firms are relatively homogeneous for the purpose of testing for capital-market imperfections, making it extremely difficult to classify these firms finely by degree of financing constraints. Winter (1998) finds that the Kaplan-Zingales indicator is either statistically insignificant or, when significant, has the wrong sign. Kaplan and Zingales (2000), in a counter-response to the defense by Fazzari, Hubbard and Peterson (2000), acknowledge that their findings do not answer the more important question - what causes the observed non-monotonicity in investment-cash flow sensitivity.

An important observation of the ensuing debate over the efficacy of the investment-cash flow sensitivity criterion as a measure of financial constraint is the implicit recognition that dividend payment is influenced by the degree of financial constrain of the firm in question. Secondly, to the extent that managers choose to rely on internal resources for investment despite the availability of external funds, a case can be made that their ability to pay dividends in such circumstances may be hampered. The reason for the conclusion is that firms usually pay dividends from internal cash flow and not from external sources, and internal cash flow is not infinite.

2.4 Empirical evidence

In recent years, cash dividend payment to shareholders has started to diminish at an alarming rate. Could the diminishing dividend payments be the result of a change in a strategy of corporations to finance investments more from retained earnings rather than from external sources, or could it also simply be a change in the payout policy through the use of share repurchase or stock options to compensate shareholders, executives, and employees, respectively? Given the various, and often conflicting, theoretical hypotheses about the role of dividends and dividend policy, there has been a voluminous empirical research done in this area. For example, Fama and French (2001) document that the proportion of firms who were listed on the NYSE, AMEX, and NASDAQ and paying regular dividends fell from 66.5% in 1978 to 20.8% in 1999. Moreover, recent declines in dividend yields appear to be of a longer-term trend. Carlson (2001) documents that average dividend yield of firms on the S&P 500 declined from 5.3% in 1945 to 4.1% in 2000. In fact as at 2000, dividend yield stood at 1.25%, a record low. Carlson (2001) also shows that the decline in dividend yield is mirrored by the decline in the average dividend payout, which has fallen from a pre-war level of 72% to a postwar level of 51%. DeAngelo, DeAngelo & Skinner (2000) also document that special dividends once commonly paid by NYSE firms have gradually disappeared over the last 40 to 50 years and are now a rare phenomenon. They record that 61.7% of dividend-paying NYSE firms paid at least one special dividend, while only 4.9% of the same category of firms paid special dividends during the first half of the 1990s.

Allen and Michaely (2002) also provide a comprehensive literature review on payout policies in the U.S, with respect to the role of taxes, asymmetric information, incomplete contracting possibilities and transaction costs etc. The accumulated evidence from their review indicates that changes in payout policies are not motivated by firms' desire to signal their true value to the market. On the contrary, dividends and repurchases are paid to reduce potential overinvestment by management. The authors also observed that the rise in the popularity of repurchases increased overall payout and increased the firm's financial flexibility. The documented increase in financial flexibility from the use of share repurchases, according to Allen and Michaely (2002), is consistent with the findings of Jagannathan, Stephens and Weisbach (2000). Appendix B below provides a detailed account of the empirical findings of the three theoretical departures from the MM dividend irrelevancy proposition.

From the empirical literature summarized in Appendix B, the following key observations and controversies are evident. Firstly, majority of the empirical research on dividend theory has concentrated on information asymmetry and signaling, and most of the conclusions have confirmed the theoretical proposition that managers use dividends as a means of passing on private information to the marketplace. The empirical findings generally support the view that managers believe that stockholders prefer reasonably stable payout ratio, and that investors tend to interpret current dividends as indication of future earnings. Secondly, existing empirical literature provides support to the agency and free cash flow hypothesis, the key observation being that dividend increases tend to lead to share price increases for over-investing firms and share price decrease for under-investing

firms. The explanation is that more dividends implies less cash for the under-investing firm for positive net present value projects, but also less cash available for the over-investing firm for negative net present value projects. Thirdly, while some empirical studies acknowledge the existence of tax clienteles, there are other studies that conclude that stockholders show no preference between capital gains and dividends. Fourthly, most of the empirical research is dominated by U.S. studies and we know very little about the Canadian environment.

Finally, from the afore-mentioned empirical and theoretical observations, key hypotheses will be developed for empirical assessment with the view to understanding the trends in payout policies in Canada, the role taxation plays in payout policies, and the impact of liquidity constraint on dividend and share repurchase decisions. Other specific research questions will also be tested to ascertain their effect on payout policies in Canada.

3.0 RESEARCH QUESTIONS AND METHODOLOGY

3.1 Research themes and hypotheses

The review of the theoretical and empirical literature has yielded several research themes on dividend policy, which require further investigation in the Canadian context. These research themes are discussed below, and their supporting literature review is summarized in table 3.

Research Question 1: Examine the aggregate patterns of dividend payout ratio and dividend yield, and actual expenditures on share repurchase.

The objective here is to provide fresh evidence on the question of whether dividends have been declining or not, and if they have been declining, the rationale for the decline. The study will use expenditure on share repurchases as a measure of share repurchase activity and contrast it with total expenditure on dividends in order to understand the alternative payout trends in the Canadian market and the characteristics of the firm in question, such as earnings volatility¹¹, age of firm, market capitalization changes, and asset value.

From the existing observation in the literature, this study hypothesizes a decline in the proportion of firms that pay dividends and a rise in the proportion of firms that use share repurchase as payout option over the sample period. Secondly, firms that repurchase shares are expected to have more earnings volatility than those that pay dividends¹².

¹¹ Earnings volatility will be measured by the standard deviation of Return on Assets which is defined as operating income before depreciation divided by the book value of total assets.

¹² Grullon and Michaely (2002) reported that firms that pay dividends and repurchase shares did not have more volatile earnings than firms that only paid dividends. This finding is underscored by the fact that 87.9% of the aggregate expenditure on share repurchases is attributed to firms that pay dividends and repurchase shares, while only 12.1% of the repurchase activity is attributed to firms that only repurchase shares. Hence,

Research Question 2: Examination of the dividend-paying pattern of foreign versus domestic controlled Canadian firms.

This examination will be conducted by classifying firms into Canadian-Controlled and Non-Canadian-Controlled¹³. Canada has strict laws on foreign ownership of Canadian firms in specific industries due to concerns of, among others, foreign domination of the Canadian economy and the consequent repatriation of profits. The objective of this study is to investigate the impact of foreign control on the dividend paying patterns of the firms in the sample, and to determine whether foreign controlled Canadian firms pay less dividends than domestic controlled firms. Based on evidence from the literature, it is expected that in the absence of a foreign investor tax credit on dividends, foreign controlled firms may have a greater propensity to pay less dividends and instead adopt share repurchases as the payout option.

Research Question 3: Investigate the dividend paying patterns of firms with dual-class share structure.

From the existing literature, and to my knowledge, there is no study that has examined the differences between dividend payment patterns of firms with dual-class share structure and those with single-class share structure¹⁴. Under agency theory, the existence of restricted shares leads to separation of ownership from control as holders of restricted shares do not

this study will examine any unique differences between firms that (a) pay only dividend (b) only repurchase shares, and (c) repurchase shares and pay dividends as well.

¹³ A firm is ultimately foreign-controlled if majority of its voting rights is either held by foreign citizens or is held by one or more Canadian companies that are themselves foreign-controlled. The InterCorporate Ownership publication by Statistics Canada will be used to trace ownership of the firms.

¹⁴ Dual-class firms have two classes of common stock with disparate voting rights. One set of common stocks have superior voting rights while the other set of stocks have restrictions on voting rights. On the other hand, most of the publicly-listed shares of single-class firms have restricted voting rights.

have voting rights in the firm, even though they often have the largest claim on cash flow. Asiedu (1996) observed that single-class firms under-perform diversely-held firms and are also perceived to be more risky compared to diversely-held firms. Others such as Jensen & Meckling (1976), Leland and Pyle (1977), Harris and Raviv (1988), DeAngelo and DeAngelo (1985) have equally observed that restricted shares reduces management ownership and increases management control and leads to lower performance. Hence, based on agency theory, firms with dual-class share structure would exhibit a different dividend payment pattern than firms with single-class share structure. It is therefore expected that the proportion of dividend paying firms which have dual-class shares would be higher than single-class firms because dual class firms tend to have higher performance while single-class firms tend to have lower performance.

Research Question 4: Investigate whether overinvesting (growth) firms have different dividend payment pattern than underinvesting (non-growth) firms using market to book value ratios or recent sales growth as proxy.

The objective here is to investigate whether over-investing (growth) firms have different dividend payment pattern than under-investing (non-growth) firms using market-to-book ratios¹⁵ or recent sales growth as proxy measures for growth¹⁶. Lang and Litzenberger (1989) and Fama and French (2002) have observed that more profitable firms and firms with fewer investments have higher dividend payouts, and that firms with more investments have lower long-term dividend payouts. Hence, from the empirical review, over-investing firms are expected to pay less dividends than under-investing firms.

¹⁵ Firms with market-to-book ratios less than 1 are over-investing and firms with market-to-book ratios greater than 1 are under-investing.

¹⁶ Overinvesting firms tend to invest in negative net present value projects.

Research Question 5: Are dividend-paying firms more risky or less risky than non-dividend-paying firms and what the unique risk characteristics are.

The study will determine whether or not dividend-paying firms are more risky than dividend non-paying firms and what the unique risk characteristics are. Fama and French (2002) observed that firms with higher business risk tend not to pay dividends and that business risk is measured as a combination of factors such as size, profitability, cash flow etc. From empirical evidence, it is expected that dividend-paying firms will be less risky than dividend non-paying firms and that the unique risk factors will be a function of the firms' fundamental variables.

Research Question 6: Investigate whether the size of the firm affects the firm's dividend paying pattern.

Empirical findings on the impact of the size of the firm on its dividend paying pattern¹⁷ are inconclusive. Redding (1997) found a positive relationship between size and dividend payments while Keim (1985) found a negative relationship between size and dividend payments. Hence, a priori positive or negative relationship between size and dividend payout cannot be postulated but the direction of the relationship will be a function of the sample in question. On the other hand, the effect of size on dividends is very important since economic rationality would dictate that larger firms with larger cash resources and better investment opportunities would tend to generate higher incomes and pay higher dividends than smaller firms.

¹⁷ Size will be measured by either the natural log of sales, market capitalization, or total assets of the firms.

Research Question 7: Examine the relationship between liquidity constraints and dividend payout-cash flow sensitivities by mimicking the Kaplan and Zingales approach.

This study will examine the relationship between liquidity constraints and dividend payout-cash flow sensitivities by mimicking the Kaplan and Zingales (1997) approach. A similar approach will be employed to examine share repurchase-cash flow sensitivities. This study hypothesizes a negative relationship between liquidity constraint and dividend payment based on arguments discussed in the liquidity constraint section of the study. Secondly, in line with the observation of Jagannathan, Stephens and Weisbach (2000), a positive relationship between liquidity constraint and share repurchases is hypothesized¹⁸.

Research Question 8: Investigate the impact of the 25% increase in the capital gains inclusion rate from 50% to 75% in 1988 on share repurchase activity in the Canadian market.

The reason for the proposed investigation is that an increase in the capital gains inclusion rate leads to a higher capital gains tax, which has the tendency to create disincentiveness to repurchase shares, all things being equal. This study hypothesizes that share repurchase activity during the period of capital gains inclusion rate increase will be lower than the period before the increase.

Table 3 below summarizes the references of specific literature findings, the research hypotheses, the measurement variables, and their expected direction.

¹⁸ The standard t-test will be used to determine the significance of the observed relationship.

Table 3: Hypotheses, measurement variables and expected signs

Study	Hypothesis	Variable	Expected Sign
Fama and French (2001); Grullon and Michaely (2002); DeAngelo, DeAngelo & Skinner (2002); Jagannathan, Stephens and Weisbach (2000) ¹⁹	The proportion of firms paying dividends has declined compared to the proportion of firms using share repurchases. Firms that repurchase shares have more earnings volatility than firms that pay dividends.	<i>Proportion of firms paying dividends versus firms repurchasing shares</i> <i>Earnings volatility of firms repurchasing shares versus firms paying dividends</i>	(-)/(+) (>+)/(<+)
Forbes and Hatem (1998) ²⁰	Positive relationship between market capitalization and dividend payouts. Negative relationship between market capitalization and dividend payout ratio.	<i>Market capitalization and dividend payout</i> <i>Market capitalization and dividend yield</i>	(+) (-)
Liljeblom and Pasternack (2002); Booth (1987) ²¹	Foreign controlled firms will tend to pay less dividends and engage in more share repurchase activities due to the existence of double taxation on dividend payments.	<i>Foreign Control versus Share Repurchases</i> <i>Foreign Control versus Dividend Payment</i>	(+) (-)
Berle and Means (1932) Jensen and Meckling (1976), Grossman and Hart (1988) Claessens et al. (1999) and La Porta et al. (1999) Nenova	Firms with dual-class share structure will tend to pay a higher proportion of dividends than firms with single-class share structure.	<i>Proportion of dividend paying firms which have dual-class structure versus single-class structure</i>	(-)/(+)

¹⁹ Fama and French (2001) reported that the number of firms paying dividends have dramatically declined over the past three decades. Grullon and Michaely (2002) have also reported significant growth in share repurchases over the same period, although they also observed that firms that paid dividends and repurchased shares did not experience more earnings volatility. DeAngelo, DeAngelo & Skinner (2004) reported that dividends paid actually increased in nominal and real terms despite the decline in the number of dividend paying firms. Jagannathan, Stephens and Weisbach (2000) also concluded that firms introduce share repurchases as an alternative to dividend payments because share repurchases are more responsive to potential future liquidity constraints than dividends.

²⁰ Forbes and Hatem (1998) concluded that whereas once only a small proportion of firms - mainly those with a very low stock price and small market capitalization - did not pay dividends, in the 1990's nearly 4 of 10 NYSE and AMEX listed firms paid no dividends.

²¹ Liljeblom and Pasternack (2002) observed a significant positive relationship between foreign ownership and share repurchases and a negative relationship between foreign ownership and dividend payments. They concluded that foreign ownership is, perhaps, the single most important variable associated with share repurchases in Finland. Booth (1987) indicated that an increase in the dividend tax credit would cause Canadian ownership in some sectors to increase.

²² Agency problems stemming from separation of corporate ownership and control have been a focus of research since the seminal work of Berle and Means (1932). Jensen and Meckling (1976), Grossman and Hart (1988) Claessens et al. (1999) and La Porta et al. (1999) maintain that parties in possession of control over a corporation extract private benefits of control at the expense of firm value accruing to dispersed shareholders. As a result, dual-class recapitalization announcements have tended to lead to under-performance of the share price of the firm making the announcement. In Canada, the response of share price to dual-class recapitalization announcement is negative but statistically insignificant. Nenova (2000)

(2000) ²²			
Lang and Litzenberger (1989), Fama and French (2002) ²³	Over-investing (growth) firms will tend to have lower dividend payouts than under-investing (non-growth) firms	Market-to-Book Ratio (M/B) as a proxy M/B <1 (Over investing - growth) M/B >1 (Under investing – non growth)	(-) (+)
Jog and Schaller (1994); Chirinko and Schaller (1995) ²⁴	Mature firms will tend to pay more dividends and maintain continuity of dividend payment than young firms	Maturity of firms Young firms ²⁵	(+) (-)
Fama and French (2002); Claessens, Djankov and Nenova (1999) ²⁶	Dividend-paying firms will be less risky than dividend non-paying firms	Fundamental variables such as debt to capitalization, interest coverage ratio.	(-)/(+)
Redding (1997); Fama and French (2001); Smith and Watts (1992); Keim (1985); Farinha (2002) ²⁷	Larger firms have the tendency to pay higher dividends than smaller firms. A negative relationship between size and dividend payment has been observed. Size will be treated as a control variable	Size (Log of total assets or total sales or market capitalization) Large firms Small firms	(+) (-)
None	This study has hypothesized a negative relationship between liquidity constraint and dividend	Dividend payout-Cash flow coefficient Share repurchase-Cash	(-) (+)

observes a negative relationship between the value of vote and dividend payment where limited-voting class receives higher dividends than the multiple-voting class.

²³ Lang and Litzenberger (1989), Fama and French (2002) observe that more profitable firms and firms with fewer investments have higher dividend payouts, and that firms with more investments have lower long-term dividend payouts, although dividends do not vary to accommodate short-term variation in investment. Dividends are therefore said to be “sticky”, which implies that they do not vary very much in the short run.

²⁴ Jog and Schaller (1994) observe a strong positive correlation between maturity of the firm and its continuous dividend payment pattern, which is consistent with Chirinko and Schaller (1995) who noted that the investment spending of mature firms is less finance-constrained than that of young firms.

²⁵ Classification of maturity will be based on the date of incorporation of the firm. Firms listed on the TSE in 1976 would be considered as mature firms since the analysis focuses on post – 1985 period. Given that liquidity-constrained firms will pay less dividends than firms who are less constrained financially, it is conceivable that mature firms who are usually less liquidity-constrained would pay higher dividends than young firms. This study expects mature firms to pay more dividends than young firms.

²⁶ In the literature, firms facing high business risks do not tend to pay dividends while well-established firms with lower business risk, measured by age, revenue size, and profit levels, etc. tend to establish and maintain dividends. Fama and French (2002) identified that, on average, payers of dividends have six times the assets of non-payers, which are indications of reduced risk. Claessens, Djankov and Nenova (1999) employ several factors to determine the riskiness of corporations in different financial systems among others, leverage, coverage, earnings variability etc.

²⁷ Redding (1997) observes that large investors tend to invest in large corporations because it lowers their transaction costs, and since these institutional investors prefer dividends, the large corporations choose to pay dividends, while the small corporations (owned by individuals) do not usually pay dividends. A positive relationship between size and dividend payments is observed. Fama and French (2001) observe that dividend payers tend to be large firms and firms that have never paid dividends tend to be smaller in size. Smith and Watts (1992) point out that the theoretical basis for the impact of size on dividend policy is not strong, and Keim (1985) observes negative relationships between size and dividend policy, while Farinha (2002) observes a significant negative relationship between firm size and dividend payouts for firms listed on the London Stock Exchange.

	payment, and a positive relationship between liquidity constraint and share repurchases	flow coefficient	
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3.2 Methodology

The key aspects of the methodology for investigating the research questions are outlined sequentially below.

3.2.1. Propensity score matching

The pair matching approach is adopted in this study to create a comparable sub-sample for the purpose of undertaking the dual-singles class and foreign-domestic control analyses²⁸. For each firm in the treatment group²⁹, a comparison firm will be selected from the listed and delisted firms with identical value on each of the explanatory variables. The explanatory variables are those likely to bias the effect of the treatment, by creating prior systematic difference between the treatment group and the matching sample. Empirical finance has, for instance, identified size as a variable that may influence the risk-adjusted market returns of the firm.

In practice, however, pair matching procedure often diminishes to selecting for each firm in the treatment group the nearest comparison firm available. To ensure the inclusion of multiple variables, "propensity score" estimates, a technique proposed by Rosenbaum and Rubin (1983), is employed to supplement the pair matching³⁰. The technique estimates the appropriate vector function $[f(x_i)]$ of the explanatory variables using a linear logistic regression model. From the logistic regression coefficients, propensity scores $[\hat{e}(x_i)]$ for

²⁸ In this study, the matching technique is used solely for the investigation of dividend payment patterns of dual-single class firms and foreign-domestic controlled firms in order to confirm replicability of the findings. The selection of these two effects on dividends is predominantly because they have not been examined in greater detail in the literature.

²⁹ For the purpose of the dual-class and single-class study, dual-class firms are considered the treatment group for each respective year. In terms of foreign-domestic analysis, foreign control firms are considered the treatment group.

³⁰ Thomas (1986) has applied this technique in forming a reference group (comparison group) for evaluating the economic benefits of the IRAP program.

each given firm is estimated and used as a mechanism for selecting the set of matching firms for each respective year³¹.

The explanatory variables used in the calculation of the propensity scores are market capitalization, total assets, total revenue, market-to-book ratio, debt-to-asset ratio, and industry classification. Matched firms fall within the range of -5% and +5% of the propensity score of the treatment firm. Matching is without replacement, i.e., each firm is selected once from the sample of listed and delisted firms to form a matched pair and does not qualify for subsequent matching within the respective year under consideration.

3.2.2 Variables separating non-dividend paying versus dividend paying firms

Special attention will be paid to companies that never paid dividends and what makes them different from those that paid dividends. To identify the variables that differentiate non-dividend paying from dividend paying firms, logistic regression will be used. Logistic regression is a frequently used model for analyzing binary data.

³¹ The estimated propensity score for a given firm is given as:

$$\hat{e}(x_i) = \left[\frac{\exp\{\hat{\alpha} + \hat{\beta}f(x_i)\}}{1 + \exp\{\hat{\alpha} + \hat{\beta}f(x_i)\}} \right] \dots\dots\dots(1)$$

Logistic regression is of the forms:

$$\log\left(\frac{\pi(x)}{1-\pi(x)}\right) = \alpha + \beta x \dots\dots\dots(2)$$

Where x is a quantitative independent variable and $\pi(x)$ is the probability of success.

Logistic regression models are special cases of generalized linear models. The link function that relates the random variable to the set of explanatory variables, the logit, is the natural parameter of the binomial distribution. The fit of the logistic regression model, therefore, helps us to describe the effects of a predictor on a binary response variable. While logistic regression appears to be a potential model for analyzing the factors that distinguish dividend-paying companies from non-dividend paying firms, the model encounters serious problems with fit when the explanatory variables are continuous or near continuous. To address this problem, the Hosmer and Lemeshow (1989) goodness-of-fit test or other similar tests will be employed since it is designed to deal with continuous explanatory variables. It is further conceivable that an analysis of the determination of factors and their influence on non-dividend versus dividend paying firms will involve multiple predictors, which lends itself naturally to the use of multiple logistic regression of the form:

$$\text{Logit}(\pi) = \alpha + \beta_1\alpha_1 + \beta_2\alpha_2 + \dots\dots + \beta_n\alpha_n \dots\dots\dots(3)$$

Where β_1 is the effect of explanatory variable (X_1) on the log odds that a binary response variable $Y=1$, controlling for other X_s .

By incorporating multiple predictor variables, the next theoretical/empirical issue that must be addressed is the nature of interaction between the predictors and the avoidance of redundancies. The loglinear model selection process in SPSS, built on hierarchical principles, will be employed to ascertain the best generating class of variables that provide a scientific approach to identifying the interaction variables. Significance testing for the effect of the predictor-variables (X)³² on the binary response ($Y=1$) for dividend paying or non-dividend paying firms, will be based on the null hypothesis that $H_0: \beta = 0$. The *p-value* of the beta will be used to determine whether the effect is significant or not. In practice however, the payout decision is not simply a binary decision of paying or not paying dividends but rather an application of different payout methods which lends itself to multiple response variables such as the decision to pay dividends only or use share repurchases only, or the decision to use a combination of dividends and share repurchases or neither of the two. To analyze multiple responses, a multinomial SAS GENMOD program based on a cumulative logit link function using size, market-to-book ratio and return on assets as the predictor variables and a four-level response variables will be used.

3.2.3 Multivariate analysis

Since the variables detailed in table 3 above jointly impact the dividend payout policy, it is important to design a functional specification where dividend payout (DP_t) can be a function of certain independent variables. This study proposes a multiple regression function as specified below³³.

³² The variables to be used are those outlined in Table 3 above.

³³ A similar modeling exercise will be undertaken with share repurchases as the dependent variable.

$$DP_i = \beta_1 \text{ liquidity constraint status} + \beta_2 \text{ Control (foreign/domestic)} + \beta_3 \text{ dual class status} + \beta_4 \text{ Risk} + \beta_5 \text{ Age} + \beta_6 \text{ Size} + \beta_7 \text{ Share Repurchase Expenditure} + \beta_8 \text{ slack} + \mu_i \dots (4)$$

Where, liquidity constraint status is defined as the mean rank liquidity constraint index.

To ensure that the results are not confounded, the non-dividend paying firms will be excluded from the multivariate analysis³⁴. When the range of dependent variables is limited, as in cases where the non-dividend paying firms are eliminated, Tobit models are used to analyze the data. The standard Tobit model is defined as:

$$y_i^* = x_i' \beta + \varepsilon_i \dots (5)$$

Where x is a predictor variable, $y_i = \{ y_i^* \text{ if } y_i^* > 0; 0 \text{ if } y_i^* \leq 0 \}$ and $\varepsilon_i \sim \text{ii dN}(0, \sigma^2)$. The log-likelihood function of the standard censored regression model is written as:

$$\ell = \sum_{i \in \{y_i = 0\}} \ln[1 - \Phi(x_i' \beta / \sigma)] + \sum_{i \in \{y_i > 0\}} \ln[\phi(y_i - x_i' \beta) / \sigma] \dots (6)$$

3.2.4 Liquidity constraint classification system

One of the hypotheses of this study is that firms with liquidity constraint will pay less dividends. To validate this hypothesis, firms with liquidity constraint must therefore be isolated from those that are not liquidity constrained. The simplest and most common procedure to categorize firms with liquidity constraint from those without liquidity

³⁴ The elimination of the non-dividend paying firms from the analysis amounts to censoring. The censored normal regression model, also called the Tobit model will be used in this case. The Tobit model will be estimated using the SAS PROC LIFEREG procedure, which provides estimates of the parameters of the distribution of the uncensored data.

constraint is to determine how sensitive cash flow is to investment decisions. The cash flow coefficient is derived by regressing investment on a measure of an investment fundamental such as Tobin's Q^{35} or a proxy thereof such as Market-to-Book Ratio and cash flow. This is expressed as:

$$I/k_{it} = \beta_{M/B} (M/B)_{it} + \beta_{CF/k} (CF/k)_{it} + \mu_{it} \dots\dots\dots (7)$$

Where I represents investment expenditure, k represents beginning-of-period book value of plant and equipment, M/B represents market-to-book ratio, and CF represents cash flow measure such as EBITDA, and β represents the coefficient of the variable in question. According to FHP (1988), firms with high investment-cash flow sensitivities tend to be financially constrained. On the contrary, Kaplan and Zingales (1997, 2000) observe that firms that are least financially constrained exhibit high investment-cash flow sensitivity. The authors therefore conclude that sensitivity of investment to cash flow is not a reliable measure of the differential cost between internal and external finance. The two opposing results suggest the need to improve the methodology of modeling liquidity constraint.

The literature on liquidity constraint categorization identifies certain variables that act as proxies for measuring the differences in the informational position of firms with respect to external markets. The theoretical argument is that liquidity constraint on firms arises from situations where there is asymmetric information between firms and potential providers of

³⁵ Tobin's Q ratio is the market value of a firm's assets divided by its replacement value. This ratio is named after Nobel Economics Laureate James Tobin of Yale University. He hypothesized that the combined market value of all the companies on the stock market should be about equal to their replacement costs. In other

external finance, creating a wedge between the internal and external cost of funds. Table 4 below summarizes the approaches used in the literature to classify firms into various degrees of liquidity constraint. These variables are size, maturity, ownership concentration, collateralized assets, financial ratios, investment-cash flow sensitivities, group membership, and dividend payout³⁶. A significant conclusion from the literature is that it is difficult if not impossible to classify firms into liquidity constraint without referring to a number of variables, which may be qualitative or quantitative³⁷.

This study proposes to classify firms into various deciles ranging from Least Constrained (“LC”) to Severe Constrained (“SC”) in accordance with the firm’s Mean Rank Liquidity Index (MR_{LI}) as shown below.

$$(MR_{LI}) = \sum_{it} (R_{it}) / m \dots \dots \dots (8)$$

Where m represent the number of variables used in the ranking, R_{it} represent the assigned rank for each firms-year for the variable under consideration.

words, the ratio of all the combined stock market valuations to the combined replacement costs should be around one.

³⁶ Other variables that could be used in measuring liquidity constraint are bond ratings of firms, lines of credit availability, bid-ask spread, Analysts recommendations.

³⁷ Appendix D and E displays pictorially the mean and median trends, respectively, of selected liquidity constraint variables used in constructing the Liquidity Constraint Index. The key observation is that the measures of size, price to book, current ratio, investment cash flow ratio, debt ratio and cash flow to debt are reasonably stable over the sample period. However, net profit, interest coverage ratio, gross profit and return on assets show volatility over the sample period.

This approach is non-parametric and has several benefits. Firstly, it is dynamic in that it reflects the changing financial conditions of the firms over the sample period³⁸. Secondly, it uses the full dimension of qualitative and quantitative characteristics of the firm to derive the mean rank index.

Table 4: Liquidity constraint measures

Study	Variable	Proxy Measure	Implication for Ranking
Stiglitz and Weiss (1981); FHP(1988); Audretsch and Elston (2000)	Size ³⁹	Log of total assets or market ⁴⁰ capitalization or total sales	The larger the size measure, the lower the constraint
Schaller (1993) ⁴¹	Maturity ⁴²	Age of the firm	The older the firm, the lower the constraint
	Ownership Concentration ⁴³	Control block % ownership per Stock Guide database	The more concentrated the ownership, the lower the constraint

³⁸ Allowing ranks to change each year does not contradict the idea behind variables such as maturity. It could be argued that once the market learns about a company, the effect of maturity on liquidity constraints should diminish. On the contrary, the market is known to constantly seek new information on old and matured firms and besides, no one single variable can completely define the liquidity constraint status of a firm.

³⁹ Stiglitz and Weiss (1981) noted that the propensity for an enterprise to be subjected to credit rationing is not neutral with respect to firm size. On the contrary, as a result of adverse selection in a market with asymmetric information, the likelihood of credit rationing tends to systematically increase as firm size decreases. Moreover, the amount of information about an enterprise is generally not neutral with respect to size. FHP (1988) also found systematic evidence that liquidity constraints tend to be more binding as firm size decreases. Hence, *ceteri paribus*, the likelihood of a firm experiencing liquidity constraint decreases along with increasing firm size. Audretsch and Elston (2000) examined the link between liquidity constraints and investment behavior for German firms of different sizes from 1970 to 1986. Their results indicated that medium sized firms appear to be more liquidity constrained in their investment behavior than the smallest or largest firms.

⁴⁰ There are several measures of size, the predominant ones being total assets, total sales, and market capitalization. Market capitalization, defined as the product of the beginning of period share price and the outstanding number of common shares, will be used as the measure of size. Due to the fact that the distribution of firm size tends to be positively skewed (i.e., larger firms deviate more from the mean than smaller firms), the natural logarithm of market capitalization will be the unit of measurement of size.

⁴¹ Jog and Schaller (1994) used the three classifications introduced by Schaller (1993) in a study of finance constraint and asset pricing.

⁴² Mature firms are less likely to face informational problems because lenders tend to know more about firms that have been visible for an extended period of time. Moreover, mature firms can credibly enter into repeated relationships with lenders, and such repeated relationships reduce informational problems.

⁴³ Schaller (1993) classified a firm as concentrated if either one shareholder holds 50% or more of the shares or the firm is effectively controlled by a shareholder.

	Collateralized Assets ⁴⁴	Non-manufacturing versus Manufacturing firms	The more marketable the collateral, the lower the constraint
Hoshi, Kashyap and Scharfstein (1991)	Group Membership ⁴⁵	Group versus independent firms as defined in Intercompany Ownership database.	Firms with long-term membership in an Industrial group are likely less constrained than those without.
Kaplan and Zingales (1997) ⁴⁶ ; Cleary (1999) ⁴⁷	Financial Ratios for liquidity, leverage, coverage, profitability, growth and slack ⁴⁸	Current or Quick ratio, Debt Ratio, Fixed Charge Coverage Ratio, Net Income Margin, Sales Growth, cash and unused lines of credit	The higher the liquidity, coverage, profitability and growth, the lower the constraint. The higher the leverage, the higher the constraint.
	Investment-cash flow sensitivities	Investment to cash flow ratio; Investment to sales ratio	The higher the investment ratio, the lower the constraint.

To determine the mean rank liquidity index⁴⁹ of the firm in year (t), the following steps are required. Firstly, several common measures in the literature which describe whether a firm is constrained by liquidity or not have been identified and outlined in table 4 above.

⁴⁴ Schaller (1993) classified firms based on prediction of asymmetric information models of debt that the availability of collateral reduces the cost wedge between retentions and debt financing. Schaller (1993) noted that because manufacturing firms rely largely on specialized assets for which resale markets are often thin, their financing costs should rise more steeply with leverage than those of non-manufacturing firms with less specialized assets that can more readily serve as collateral.

⁴⁵ Hoshi, Kashyap and Scharfstein (1991) further introduced a classification system based on membership in an industrial group. The authors noted that entrance into long-term relationships, such as membership of a major Japanese "Keiretsu", created reputational effects that allowed members to communicate private information about the quality of individual projects to other members of the group. Group membership therefore reduces the effects of asymmetric information on the firm in question.

⁴⁶ Kaplan and Zingales (1997) used the qualitative information of management's discussion of liquidity and capital resource requirements of the firm in annual reports and quantitative information in the financial statements and notes, to classify each firm-year into five groups of varying liquidity constraint. The firm-year classification was based on a combination of factors such as dividend initiations or increase in cash dividends, repurchased stocks, explicit statements in the annual reports on liquidity of the firm, and debt covenant violations.

⁴⁷ Cleary (1999) employed a financial constraint index based on several proxies for liquidity, leverage, profitability, and growth, which define a firm's financial status.

⁴⁸ Slack is included as a proxy for cash and unused line of credit, a measure of liquidity. The calculation is based on traditional credit line arrangements that enable firms to establish lines of credit up to 50% of inventory and 75% of accounts receivable. Slack is defined as $\text{Cash} + \text{short term investments} + (0.50 * \text{inventory}) + (0.70 * \text{accounts receivable}) - \text{short term loans}$.

⁴⁹ The mean rank liquidity index is a newly proposed methodology for classifying firms into different classes of liquidity constraint.

Secondly, using the measures in table 4 above, each year firms are assigned a rank with the best rank (1 = best rank) representing the least constrained⁵⁰. Thirdly, for each firm-year, the ranking of the variables are summed to determine the total rank of the firm. The mean rank of each firm is derived by dividing the total rank of each firm by the number of ranks used. Fourthly, using the mean rank as the measure of liquidity constraint, the firms are categorized into deciles. Fifthly, the above process is repeated for each year over the sample period.

An alternative ranking may be necessary to reflect the impact of industry membership on liquidity constraint. Although there is in a sense no direct connection between the industry the firm is in and liquidity constraint, it is arguable that access to the capital market is easier in some industries than others. It is also noted that although collateralized assets may be a good proxy for industry membership, it only classifies firms into manufacturing and non-manufacturing⁵¹.

3.2.5. Liquidity constraint and dividend payout-cash flow sensitivities.

The first segment of the analysis will involve separating the sample into financially constrained and non-financially constrained firms and regressing dividend payout (DP_t) on liquidity (or an acceptable cash flow measure (CF)) and Market-to-Book Ratio (M/B)⁵².

⁵⁰ Tied measurements will be assigned a rank based on the average of the ranks they would receive if they were unequal but occurred in successive order.

⁵¹ To control for industry membership, an industry normalization technique may be employed. Although this technique is not developed in this study, industry classification as a variable is used in the ranking process.

⁵² Market-to-Book ratio controls for or captures any effects of investment opportunities available to the firm.

The second segment of the analysis will regress share repurchase expenditure on cash flow and a measure of Tobin's Q. The regression to be used will be similar to equation (7) above. The significance of the difference between the two groups will be tested using the p-value based on simulation.⁵³

3.2.6. Capital gains tax effect on share repurchase activity

The research question to investigate is whether share repurchase activity is similar over the two sub-periods, 1980 to 1987 and 1988 to 2001, respectively⁵⁴. The test will be based on various measures of share repurchase activity. Examples of these measures are share repurchase expenditure to total payout, and share repurchase expenditure to dividend expenditure. The null hypothesis will be tested using the Wald statistic ("W").

$$W = (\mu_1 - \mu_2)^2 / (\delta_1^2 + \delta_2^2) \dots\dots\dots(9)$$

Where μ_1 (μ_2) is the mean value of the variable of interest over the period 1980 to 1987(1988 to 2001), δ_1^2 (δ_2^2) is the sample variance of μ_1 (μ_2), and total payout is the sum of total share repurchase expenditure and dividend expenditure.

⁵³ The standard test of differences may be inappropriate because the variance of the error term of panel data will usually violate the Gauss-Markov conditions. Hence a simulation of the empirical *p-value* is the preferred approach. The null and alternate hypotheses to be tested are as follows. Hypothesis: Null Hypothesis: $H_0: d=0$ (ii) Alternative Hypothesis: $H_1: d>0$ (one tailed test). To implement the simulation, several steps are required: (i) Run the regression for the two groups and determine the actual observed difference between the two (actual sample difference (d_{actual})). (ii) For each year, randomly assign observations of the two groups under study into two arbitrary groups, group 1 and group 2. (iii) Using the regression equation, calculate the coefficient of each group and determine the difference between the calculated coefficients (simulated sample difference ($d_{simulated}$)). (iv) Repeat process (ii) and (iii) for say 5000 times. The empirical p-value is the percentage (%) of simulations where the difference between coefficient estimates exceeds the actual observed difference in coefficient estimates. For example a p-value of 0.002 implies that only 10 out of 5000 simulated outcomes exceed the actual sample results, which implies that the sample difference is significant.

⁵⁴ During the period 1980 to 1987, the capital gains inclusion rate was 50%. The 1987 budget however, increased the capital gains inclusion rate to 75%.

4.0 RESULTS AND DISCUSSION

4.1 Sample description and selection

The sample for this study is derived principally from the Canadian Stock Guide database⁵⁵. To avoid survivorship bias in the analysis, the study uses all currently listed and previously delisted Canadian firms found in the Stock Guide⁵⁶. The study covers a period of fifteen years from 1987 to 2001 inclusive, as shown in table 5 below⁵⁷. Amounts in table 5 are in nominal dollars, and all financial variables used in this study are also shown in Appendix C of the study.

There are 1889 firms in the sample, comprising 1073 listed firms (57%) and 816 delisted firms (43%). Of the 1889 firms, 1689 firms (89%) are either currently listed on or previously delisted from the Toronto Stock Exchange ("TSE"), 141 firms (7%) from the Vancouver Stock Exchange, 34 firms (2%) from the NASDAQ and 25 firms (1%) from the Montreal Stock Exchange. The 1889 sample of firms contains 28,335 firm-year observations over the period 1987 to 2001.

⁵⁵ The data is collected from official documents filed with the Ontario Securities Commission and /or the Quebec Securities Commission in the form of annual reports, interim reports, proxy and management information circular and annual information form. Stock Guide also requests reports directly from all companies and subscribes to microfiche service covering most reports that are filed with the Securities Commission.

⁵⁶ Survivorship bias is the tendency for failed companies to be excluded from performance studies due to the fact that they no longer exist. Survivorship bias causes the results of such studies to skew higher because only companies which were successful enough to survive until the end of the period are included. Survivorship bias results in an overestimation of past performance and may create an overly optimistic prediction of future performance.

⁵⁷ The use of 1987 as the starting period of the analysis is due to completeness restrictions imposed by the database, whereas the use of 2001 as the ending period of the analysis is due to the availability of the data at the time of the thesis.

The 1889 firms are represented by nine major industry classifications, namely: Materials (25%), Industrials (15%), Consumer (14%), Energy (12%), Information Technology (12%), Healthcare (8%), Financials (7%), Utilities (5%), and Telecommunication Services (3%). In 1987, the total assets of the sample was Cdn. \$764 billion, the total revenue was Cdn. \$277 billion, and the total market capitalization was Cdn. \$224 billion. By 2001, total assets was Cdn. \$3,173 billion, total revenue was Cdn. \$985 billion, and market capitalization was Cdn. \$1,016 billion. Financial institutions as shown in table 5 panel D represent 7% of the total sample while non-financial institutions represent 93% of the sample size. In 1987 financial institutions in the sample had total asset base of Cdn. \$32 billion (4%) and non-financial institutions had Cdn. \$732 billion (96%) of assets. By 2001, the asset base of financials had grown to Cdn. \$159 billion (5%) while non-financials was at Cdn. \$3,012 billion (95%).

Table 5 further displays the sizes of the firms within the sample over the fifteen-year period, using nominal dollars. Using the classification of small, medium and large firms based on total assets, each class experienced growth in the number of firms from 1987 to 2001 due to new listing of firms. However, the proportion of small, medium and large firms has remained relatively unchanged over the sample period regardless of the basis of classification. On average, 16% of the firms in the sample are small firms, while 41% are medium firms, and 43% are large firms. On the basis of market capitalization 19% of firms are, on average, small firms, while 42% are medium firms, and 39% are large firms. The revenue-based classification is, however, slightly different in that 27% of the firms are small firms, while 35% are medium and 37% are large firms. It is important to note that

size categories, using total assets or market capitalization, are approximately the same in terms of the proportion of firms classified as small, medium and large, respectively. However, size categories using revenue are different from size categories using assets or market capitalization because the proportion of small firms in the revenue-based category is about 10% higher than the other categories.

Table 5 also displays the count of firms who actually paid dividends over the period 1987 to 2001 as well as the count of firms that repurchased common and preferred shares over the same period. The share repurchase expenditure file is derived from the Compustat Canadian database, however, only firms that are also in the Stock Guide database are used in the share repurchase analysis. While the count of dividend payers and share repurchases have both increased over the sample period, the percentage growth between the start of 1987 and the peak year are however different. Firms repurchasing shares experienced 364% growth in count while firms paying dividends experienced 83% growth in count showing that proportionately more firms engage in share repurchase activity than dividend payment activity. It is important, however, to note that many companies may be repurchasing shares for option payment or some other management compensation activities. In terms of dollars, the share repurchase amount is, however, small compared to the dividend amount. In 1987 the total dividend declared was Cdn. \$7.41 Billion while the corresponding share repurchases was Cdn. \$1.87 Billion. By 2001, total dividends declared was Cdn. \$19.06 Billion and share repurchases was Cdn. \$12.23 Billion. The interesting observation, however, is that the growth in share repurchase amount over the fifteen-year period to 2001 was 554% and exceeded the 157% growth in dividends declared. In fact in

1996, the total amount of cash spent on dividends exceeded cash spent on share repurchases by just Cdn. \$1.49 billion.

Table 5: Sample description (in nominal dollars)

A. Description	Observations	Percentage	B. Industry	Observations	Percentage
Montreal	25	1%	Materials	470	25%
NASDAQ	34	2%	Energy	218	12%
Toronto	1689	89%	Industrials	285	15%
Vancouver	141	8%	Consumer	270	14%
Total	1889	100%	Utilities	90	5%
			Telecommunication Services	53	3%
Listed	1073	57%	Information Technology	225	13%
Delisted	816	43%	Financials	134	7%
Total	1889	100%	Healthcare	144	8%
			Total	1889	100%

C. Size based on Assets	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Small <\$10 million – count	52	58	65	88	140	165	142	140	208	214	188	211	232	179	159
Medium >\$10mln <\$100 million	130	144	172	219	277	340	403	429	460	532	557	549	526	499	435
Large >\$100 million	143	176	207	254	295	327	365	422	449	496	536	569	573	565	528
Small	16%	15%	15%	16%	20%	20%	16%	14%	19%	17%	15%	16%	17%	14%	14%
Medium	40%	38%	39%	39%	39%	41%	44%	43%	41%	43%	43%	41%	40%	40%	39%
Large	44%	47%	47%	45%	41%	39%	40%	43%	40%	40%	42%	43%	43%	45%	47%
D. Size based on Market Value	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Small <\$10 million – count	44	71	94	149	193	186	122	140	126	129	160	226	223	202	225
Medium >\$10mln <\$100 million	123	148	176	216	229	274	366	411	403	472	480	483	489	501	459
Large >\$100 million	122	131	155	171	209	251	330	351	390	477	502	463	494	475	432
Small	15%	20%	22%	28%	31%	26%	15%	16%	14%	12%	14%	19%	18%	17%	20%
Medium	43%	42%	41%	40%	36%	39%	45%	46%	44%	44%	42%	41%	41%	43%	41%
Large	42%	37%	36%	32%	33%	35%	40%	39%	42%	44%	44%	40%	41%	40%	39%
E. Size based on Revenue	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Small <\$10 million – count	71	92	109	142	200	238	247	275	335	389	368	358	372	303	263
Medium >\$10mln <\$100 million	117	120	145	179	236	274	319	352	381	422	464	476	462	440	381
Large >\$100 million	130	158	179	228	260	294	319	341	369	397	422	451	458	463	442
Small	22%	25%	25%	26%	29%	30%	28%	28%	31%	32%	29%	28%	29%	25%	24%
Medium	37%	32%	33%	33%	34%	34%	36%	36%	35%	35%	37%	37%	36%	36%	35%
Large	41%	43%	41%	42%	37%	36%	36%	35%	34%	33%	34%	35%	35%	38%	41%

F. Totals	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Assets (Cdn. \$Blns)	764	1,044	1,125	1,303	1,419	1,484	1,297	1,525	1,711	1,956	2,316	2,781	2,854	3,163	3,173
Revenue (Cdn. \$Blns)	277	350	396	458	474	434	406	470	506	557	654	778	846	1,014	985
Market Value (Cdn. \$Blns)	224	273	288	293	327	296	347	383	443	603	748	789	1,132	1,372	1,016
Share Repurchase (Cdn. \$Blns)	1.87	2.71	1.90	1.17	0.86	1.87	2.24	2.84	5.49	9.17	8.01	5.33	7.90	14.23	12.23
Dividends (Cdn. \$Blns)	7.41	9.95	9.86	10.57	11.82	8.14	7.53	8.93	9.23	10.66	12.28	14.18	14.79	16.99	19.06

G. Financials & non-financials															
Description	Observations					Percentage (%)									
Financials	134					7%									
Non-Financials	1,755					93%									
Total	1,889					100%									
Size based on Assets	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Financials (Cdn. \$Blns)	32	207	194	241	277	339	119	133	141	138	157	174	185	152	159
%	4%	20%	17%	19%	20%	23%	9%	9%	8%	7%	7%	6%	6%	5%	5%
Non-Financials (Cdn. \$Blns)	732	837	931	1,061	1,142	1,144	1,179	1,392	1,570	1,817	2,159	2,608	2,668	3,010	3,012
%	96%	80%	83%	81%	80%	77%	91%	91%	92%	93%	93%	94%	94%	95%	95%
Size based on Market Value	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Financials (Cdn. \$Blns)	23	47	57	44	55	56	54	54	63	96	156	157	162	249	249
%	10%	17%	20%	15%	17%	19%	16%	14%	14%	16%	21%	20%	14%	18%	24%
Non-Financials (Cdn. \$Blns)	202	226	231	249	272	239	292	329	380	508	592	632	970	1,123	768
%	90%	83%	80%	85%	83%	81%	84%	86%	86%	84%	79%	80%	86%	82%	76%
Size based on Revenue	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Financials (Cdn. \$Blns)	54	95	113	125	124	119	82	88	104	110	136	192	209	231	243
%	19%	27%	29%	27%	26%	27%	20%	19%	21%	20%	21%	25%	25%	23%	25%
Non-Financials (Cdn. \$Blns)	224	255	283	333	351	315	324	382	401	448	518	586	638	782	742
%	81%	73%	71%	73%	74%	73%	80%	81%	79%	80%	79%	75%	75%	77%	75%

4.2 Time trends in dividends and share repurchases

The objective here is to investigate the changes in the incidence of dividend payers among all listed and delisted Canadian firms. To accomplish this objective, the study examines the total number of listed and delisted firms each year and the number of firms that pay dividends, do not pay dividends, never paid dividends, and formerly paid dividends. The sample includes all TSE, Vancouver, Montreal listed, and delisted Canadian firms. A firm must have market equity data (i.e., price of share, shares outstanding) for December of year t to be included in the sample. “Payers” are defined as those who pay dividends in year t , and “non-payers” are defined as those who do not pay dividends in year t . The non-payers group is further subdivided into two sub groups, namely, “Never Paid” and “Former Payers”. The Never paid sub group represents firms that have never paid dividends over the sample period, and the Former Payers subgroup represents firms that do not pay dividends in year t but did pay dividends in a previous year.

The 310% growth in the combined listed and delisted firms of dividend payers and non-payers from 324 firms in 1987 to 1,122 firms in 2001 is mainly attributed to the cumulative effect of new listings during that period of economic expansion. However, the proportion of new listings to the total sample declined from 12.96% in 1987 to 0.45% in 2001 when the recent down-cycle commenced.

It is equally important to note in table 6 Panel A that the population of dividend payers increases steadily from 175 firms in 1987 to 320 firms in 1996 which is an 83% increase and drops to 259 firms in 2001, which represents a 19% decline. Dividend payers are lost

from the dividend-payer sample when firms either stop paying dividends or become delisted and it is possible that firms that stop paying dividends have a higher probability of being delisted. Dividend payers are added to the sample of payers when former payers resume dividend payment or firms that never paid dividends initiate dividend payment or new firms pay dividends in the year of listing. Much of the growth in dividend payers during the period from 1987 to 1996 is attributed to firms that never paid dividends initiating dividend payment, or former payers resuming dividends, or new firms that pay dividend in the year of listing.

Table 7 provides an outline of the change in the number of payers. The rate at which dividend payers are lost from the sample due to terminations (Stop Paying) and delistings (Delist), rises from 6.29% per year in 1988 to 18.06% per year in 2001. Much of the growth in the rate at which dividend payers are lost is reflected in the increase in the firms that delisted. The rate at which dividend payers terminate dividends appears to have two peaks. It starts at 6.29% in 1988 and peaks at 12.86% in 1992, the start of the 1993 economic recession. The second peak of the rate of termination of dividend payers occurs in 2001 at 10.42%, the start of the recent bear market. On average, there is a sturdy rate of termination of 8.32% through out the period from 1988 to 2001, which appears consistent with the findings of DeAngelo and DeAngelo (1992) that only distressed firms with strong negative earnings terminate dividends. The rate at which dividend payers delist reaches the peak at 8.9% in 2000 from 2.86% in 1992.

Although dividend payers shrink and disappear at increasing rate during the period from 1988 to 2001, an equally important variable in the decline of the payers is the failure of

new payers to replace those that are lost. All non-payers which consists of Never Paid and Former Payers resume dividends at the rate of 10.07% per year in 1988, but this rate falls sharply to 4.66% in 1992 and continues to fall steadily thereafter to 2.2% in 2001. At the same time, New Lists starts to increase from 1987 but the proportion that pays dividends in the year of listing declines from 49.02% in 1988 to 3.13% in 1999. Moreover, Non-payers delist at a slightly higher rate of 5.07% on average (10.99% in 2001) than Payers at a rate of 3.9% on average (7.64% in 2001). Hence, delistings actually reduce the number of firms paying dividends but may increase the percentage of firms paying dividends.

Fig. 1. The Proportion of Delisted and Listed Firms in Different Dividend Groups

Fig. 1. The percent of firms in the different dividend groups. The sample includes all TSE, Vancouver, Montreal listed and delisted Canadian firms. A firm must have market equity data (i.e., price of share, shares outstanding) for December of year t to be in the sample. Payers pay dividends in year t , non-payers do not pay dividends in year t . The non-payers group is subdivided into two groups, namely, Never Paid and Former Payers. Never paid represent firms that have never paid dividends over the sample period and the second subgroup represent Former Payers. Former payers represent firms that do not pay dividends in year t but did pay dividends in a previous year.

Figure 1 and table 6 Panel A show that the proportion of listed and delisted Canadian firms paying dividends fell sharply from 54.01% in 1987 to 30.19% in 1993 and steadily declined thereafter. In 2001, only 23.08% of firms paid dividends. Thus, over the 15-year period, the proportion of dividend payers fell by 30.93%. The Canadian results are consistent with the findings of Fama and French (2001) which documented that the proportion of firms listed on the NYSE, AMEX, and NASDAQ and paying regular dividends fell from 66.5% in 1978 to 20.8% in 1999. Dividends are therefore disappearing in the Canadian market.

Figure 1 also provides a view of the potential factors that may explain the decline in the percent of firms paying dividends. Terminations and resumptions usually determine the population of the sample of former payers. The proportion of former payers declines by 8.22% between 1987 and 2001. Moreover, the proportion of firms who never paid dividends increased by 39.15% from 1987 to 2001. Hence, the decline in the proportion of firms paying dividends, from 54.01% in 1987 to 23.08% in 2001, and which represents a 30.93% decline, coupled with the 8.22% decline in the firms who formerly paid dividends, matches the 39.15% growth, i.e., 27.16% in 1987 to 66.31% in 2001, of the proportion of firms that have never paid dividends. From the foregoing, the number of New Lists that feed into the sample and the increasing proportion of New Lists that never become dividend payers may significantly explain the decline in the number of payers and the increase of the overall sample of firms.

Table 6 Panel B shows a classification of listed and delisted Canadian firms into various groups of payouts namely, those firms that used dividends only, firms that used a

combination of dividends and share repurchases, firms that used share repurchases only and a matched sample of firms that used neither dividends nor share repurchases. There are several observations that lend further support to the disappearance of dividends. Firstly, only a small percentage of dividend payers also engaged in share repurchases at the same time. Secondly, the percentage of firms using dividends only declined by 36.8% from 68% in 1987 to 31.2% in 2001. When dividend payers are considered, including dividend paying firms who engage in the use of share repurchases, the proportionate decline in the number firms of that class is 35%. Thirdly, while the count of the firms using share repurchases increased over the sample period, the percentage of share repurchase users to the total sample increased only slightly by 1.78% although, the dollars expended on share repurchases increased significantly over the sample period.

The key observation in the foregoing discussion is that the proportion of dividend paying firms declined sharply from 54.01% in 1987 to 23.08% in 2001. The proportionate decline in dividends is steady regardless of the sample classification used. These results are consistent with the Fama and French (2001) results and highlight the fact that dividends are disappearing in Canada. The decline in the percent of firms paying dividends may significantly be explained by the number of New Lists feeding into the sample of firms and the growing proportion of firms that never become dividend payers. The documentation of the decline in the proportion of firms that paid dividends in Canada over the sample period, is a confirmation of one of the key hypothesis of this study.

Table 6 Panel A: Count and percent of listed and delisted Canadian firms in different dividend groups.

Payers pay dividends in year t , non-payers do not pay dividends in year t . The non-payers group is subdivided into two groups namely Never Paid and Former Payers. Never paid represent firms that have never paid dividends over the sample period. Former payers represent firms that do not pay dividends in year t but did pay dividends in a previous year. A New List is a firm that first appears on Stock Guide database in year t . New List that pay is the percentage of newly listed firms that pay in year t .

Count of Firms	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All firms	324	377	443	560	709	826	901	982	1108	1236	1280	1328	1330	1243	1122
Non-payers	149	173	215	300	429	550	629	698	806	916	972	1022	1038	955	863
Never paid	88	110	147	212	303	393	455	530	647	759	808	861	886	837	744
Former payers	61	63	68	88	126	157	174	168	159	157	164	161	152	118	119
Payers	175	204	228	260	280	276	272	284	302	320	308	306	292	288	259
New Lists	42	51	66	115	145	132	99	127	205	189	125	132	96	34	5
New Lists that pay	1	25	25	42	38	20	10	15	23	26	9	8	3	5	2
Percent of Firms	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Non-payers	45.99	45.89	48.53	53.57	60.51	66.59	69.81	71.08	72.74	74.11	75.94	76.96	78.05	76.83	76.92
Never paid	27.16	29.18	33.18	37.86	42.74	47.58	50.50	53.97	58.39	61.41	63.13	64.83	66.62	67.34	66.31
Payers	54.01	54.11	51.47	46.43	39.49	33.41	30.19	28.92	27.26	25.89	24.06	23.04	21.95	23.17	23.08
Former payers	18.83	16.71	15.35	15.71	17.77	19.01	19.31	17.11	14.35	12.70	12.81	12.12	11.43	9.49	10.61
New Lists	12.96	13.53	14.90	20.54	20.45	15.98	10.99	12.93	18.50	15.29	9.77	9.94	7.22	2.74	0.45
New Lists that pay	2.38	49.02	37.88	36.52	26.21	15.15	10.10	11.81	11.22	13.76	7.20	6.06	3.13	14.71	40.00

Table 6 Panel B: Count and percent of firm for different payout groups

Number of firms that (A) used dividends only (B) used share repurchases and dividends together (C) used share repurchases only (D) used neither share repurchases nor dividends.

Count of firms	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Dividends Only (A)	166	194	220	246	274	269	263	267	280	289	268	261	236	228	221
Dividend and Share Repurchase (B)	9	10	8	14	6	7	9	17	22	31	40	45	56	60	38
Repurchases Only (C)	48	64	55	62	56	51	60	72	87	94	106	137	174	194	140
Neither (D)	21	16	26	28	44	51	76	115	176	221	256	361	431	375	309
Dividend Payers (A+B)	175	204	228	260	280	276	272	284	302	320	308	306	292	288	259
Share Repurchasers (B+C)	57	74	63	76	62	58	69	89	109	125	146	182	230	254	178
A+B+C+D = E	244	284	309	350	380	378	408	471	565	635	670	804	897	857	708

Percent of firms	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Dividends Only (A)÷(E)	68	68	71	70	72	71	64	57	50	46	40	32	26	26	31
Dividend and Share Repurchase (B)÷(E)	3	3	3	4	2	2	2	4	4	5	6	6	6	7	5
Repurchases Only (C)÷(E)	20	23	18	18	14	14	15	15	15	14	16	17	20	23	20
Neither (D)÷(E)	9	6	8	8	12	13	19	24	31	35	38	45	48	44	44
Dividend Payers (A+B)÷(E)	72	72	74	74	74	73	67	60	53	50	46	38	33	34	37
Share Repurchasers (B+C)÷(E)	23	26	20	22	16	15	17	19	19	20	22	23	26	30	25
Repurchases Only (C)÷(B+C)	84	86	87	82	90	88	87	81	80	75	73	75	76	76	79
Dividend and Share Repurchase (B)÷(B+C)	16	14	13	18	10	12	13	19	20	25	27	25	24	24	21
A+B+C+D	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 7: What happens in year t to Canadian firms that do and do not pay dividends in year $t-1$

Firms that "Continue to Pay" pay dividends in year $t-1$ and t . Firms that "Stop Paying" pay dividends in $t-1$ and not in t . Delist includes all other firms delisted in year t .

What happens in year t to firms that pay dividends in year $t-1$ (percent)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Continue to pay	93.71	92.65	91.67	87.69	84.29	86.96	87.87	87.32	88.08	85.63	89.61	86.27	85.27	81.94
Stop paying	6.29	7.35	8.33	12.31	12.86	8.70	7.72	6.34	7.28	9.06	6.82	7.19	5.82	10.42
Delist	0.00	0.00	0.00	0.00	2.86	4.35	4.41	6.34	4.64	5.31	3.57	6.54	8.90	7.64
Number of Firms	175	204	228	260	280	276	272	284	302	320	308	306	292	288

What happens in year t to firms that do not pay dividends in year $t-1$ (percent)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Start paying	10.07	8.09	4.19	4.67	4.66	3.82	4.45	4.30	3.23	2.73	2.16	2.45	3.28	2.20
Do not pay	89.93	91.91	95.81	95.33	92.77	92.36	89.03	86.25	90.57	90.28	90.02	90.31	87.28	86.81
Delist	0.00	0.00	0.00	0.00	2.56	3.82	6.52	9.46	6.20	6.99	7.82	7.24	9.44	10.99
Number of firms	149	173	215	300	429	550	629	698	806	916	972	1022	1038	955

Percent of non-payers in year $t-1$ that start paying in year t

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All non-payers in $t-1$	10.07	8.09	4.19	4.67	4.66	3.82	4.45	4.30	3.23	2.73	2.16	2.45	3.28	2.20

4.2.1 Trends in aggregate dividend payout ratios and dividend yields

The dividend payout ratio and dividend yield experience on the Canadian market is shown in table 8 and table 9 respectively and covers a fifteen-year period from 1987 to 2001. The data excludes all zero and undefined yield and payout information for all listed and delisted firms, and the results are derived using percentiles.

Starting from 1987 with an average dividend payout ratio of 48.81% for all listed and delisted firms in Canada (Table 8 – Panel A), the reported average dividend payout ratio increases sharply to 118% in 1991 and declines gradually to 62.48% in 2000 (86.38% in 2001), with the median dividend payout ratio following the same pattern. In 1987, the median dividend payout was 28.88%, and, thereafter, it increases steeply to 58.2% by 1991. Subsequently, the median dividend payout declines gradually to 27.36% (34.13% in 2001). The results in Table 8 – Panel B are similar to Panel A with the exception that the payout ratios are smaller due to the fact that Panel A excludes all zero and undefined payout ratios from the analysis. It is important to note that given that the Canadian market is smaller in comparison to the U.S. market, and the period of study much shorter than the U.S. study, the effect of market cycles on aggregate dividend payouts is likely to be more pronounced. The uniqueness of the Canadian market notwithstanding, the decline in average dividend payout ratios and median dividend payout ratios, respectively, from 1991 to 2001 mirrors the findings in the U.S. market.

The trends in aggregate dividend yields in Canada are impacted by market cycles as higher stock market prices tends to lead to higher market capitalizations and subsequently lower dividend yields, all things being equal. From 1987 in Table 9 – Panel A, the average dividend yield rises gradually from 3.27% to 5.05% in 1991, thereafter, the average dividend yield bottoms out at 2.76% in 1993. From the low of 2.76% in 1993, dividend yield continue its gradual increasing trend, albeit relatively stable, until it reaches 4.43% in 1999 after which the average dividend yield increases very sharply to 7.94% in 2000 (6.72% in 2001). Although Table 9 – Panel B does not exclude zeros and undefined yield data, the results are equally instructive in that the mean dividend yield declines from its peak of 2.11% in 1991 to as low as 1.55% in 2001, following a rise from 1.86% in 1987. While the mean yields in Table 9 – Panel B are smaller than in Table 9 – Panel A, the trend is however, the same.

Fig 2 (i) and (ii) below shows the negative relationship between average stock price (year-close) and average dividend yield over the sample period. From the period of 1987 to 1991 when market price falls, average dividend yield by definition rises. As stock market price rise sharply, average dividend yields drop precipitously to 1993. Thereafter, average market price remains relatively stable and is mirrored by the yields until 1999 when dividend yield rises sharply as average prices begin to fall. The relationship between yield and price is further analyzed using the median yield since the median yield line in figure 2(i) is fairly stable and the median yield may be a better indicator than the mean yield as prices may be very volatile. From 1987 to 1990, as market price fell, the median yield rose.

Thereafter, the median yield continued a falling trend as market prices experienced a rising trend.

The major observation from the Canadian data is that over the period from 1987 to 2001, the median dividend yield has declined in most periods. With the exception of the period from 1987 to 1990 when the median yield increased from 2.5% to 3.72%, the median yield has generally declined to 2.27% as at 2001. The median dividend payout ratio has also experienced a decline from 58.20% in 1991 to 34.13% in 2001. Consistent with the Canadian results, Carlson (2001) documented that average dividend payout of firms on the S&P 500 have declined from pre-second war level of 72% to a postwar level of 51% and have mirrored the decline in dividend yield from 5.3% in 1945 to 4.1% in 2000. DeAngelo, DeAngelo & Skinner (2000) also showed that special dividends once commonly paid by NYSE firms have gradually disappeared over the last 40 to 50 years from 61.7% of dividend-paying NYSE firms to 4.9% during the first half of the 1990s. The decline in dividend payout ratio in the Canadian market has equally mirrored the decline in the dividend yield, and the Canadian results are therefore consistent with the findings in the U.S. market.

Fig 2(i) Dividend Yield

Fig 2(ii) Share Price

Table 8 Panel A: Dividend payout quintiles 1987-2001 - listed and delisted firms in stock guide database - excluding zeros and undefined (percent)

Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Entire sample mean	48.81	61.14	73.68	91.35	118.36	89.73	75.94	68.13	57.08	70.53	70.47	74.49	68.05	62.48	86.38
83.33 Percentile	62.70	64.83	74.18	109.24	165.33	106.59	86.01	81.28	88.83	100.37	93.81	94.07	96.60	96.72	114.59
66.67	41.59	45.96	48.78	58.76	84.11	61.61	53.76	45.54	42.55	52.50	55.49	49.37	52.30	45.12	62.40
50	28.88	35.02	35.34	43.46	58.20	46.77	36.51	32.36	28.68	30.10	31.54	32.18	31.17	27.36	34.13
33.33	21.74	23.23	24.69	30.43	38.64	30.59	23.35	20.04	21.39	19.88	19.78	20.39	20.65	20.32	21.06
16.67	13.53	15.47	18.33	19.06	22.64	16.87	15.25	13.54	14.57	13.20	12.99	14.23	13.49	11.31	14.28
No. of Observations	166	180	193	208	203	213	238	258	274	284	285	257	266	262	230

Table 8 Panel B: Dividend payout quintiles: 1987-2001 - listed and delisted firms in stock guide database (percent)

Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Entire sample mean	36.33	48.70	67.72	84.45	109.21	82.73	65.96	61.03	50.29	63.79	63.76	72.25	66.06	54.57	63.89
83.33 Percentile	51.53	58.10	71.52	105.93	158.00	99.37	80.73	76.83	81.71	97.30	90.68	91.81	95.27	84.63	97.11
66.77	31.33	40.39	45.69	55.62	81.14	59.48	47.05	41.43	38.28	45.96	46.94	48.89	51.31	40.76	40.00
50.00	21.27	27.51	33.81	38.77	50.01	43.80	31.32	26.20	25.58	27.28	27.47	30.90	30.56	23.67	20.96
33.33	9.41	15.25	22.19	24.93	33.84	26.28	17.54	16.86	17.89	17.92	17.08	19.93	19.46	15.84	10.44
16.67	0.00	0.00	13.85	15.91	15.83	11.55	6.56	8.96	6.70	8.11	7.36	13.45	12.58	7.22	0.00
No. of Observations	223	226	210	225	220	231	274	288	311	314	315	265	274	300	311

Table 9 Panel A: Dividend yield quintiles 1987-2001 - listed and delisted firms in stock guide database - excluding zeros or undefined (percent)

Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Entire sample mean	3.27	4.16	4.07	4.39	5.05	4.44	2.76	3.39	3.15	3.97	3.21	4.01	4.43	7.94	6.72
83.33 Percentile	5.22	5.31	5.27	6.56	5.45	5.72	4.27	4.74	4.70	4.69	4.00	4.98	5.94	7.35	8.31
66.67	3.54	3.88	3.83	4.70	4.00	3.91	2.84	3.24	3.34	3.02	2.56	2.99	3.32	3.68	3.44
50.00	2.50	2.91	2.93	3.72	3.05	2.54	1.80	2.06	2.27	2.00	1.75	1.89	2.15	2.54	2.27
33.33	1.81	2.19	2.05	2.48	2.00	1.75	1.22	1.40	1.51	1.36	1.22	1.45	1.47	1.65	1.56
16.67	1.05	1.34	1.25	1.52	1.31	1.17	0.80	1.04	1.02	1.00	0.80	0.87	0.94	1.02	0.95
No. of Observations	165	194	220	246	260	249	248	266	274	301	292	290	283	279	257

Table 9 Panel B: Dividend yield quintiles 1987-2001 - listed and delisted firms in stock guide database (percent)

Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Entire sample mean	1.86	2.31	2.12	2.03	2.11	1.58	0.85	1.01	0.95	1.11	0.82	1.00	1.04	1.89	1.55
83.33 Percentile	3.91	4.09	3.92	4.43	3.64	2.67	1.66	1.74	2.00	1.56	1.29	1.44	1.33	1.55	1.28
66.67	2.19	2.43	2.14	2.14	1.44	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	0.90	0.96	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No. of Observations	290	349	423	532	622	702	809	893	911	1074	1137	1168	1201	1173	1111

4.2.2 Trends in corporate payout

To examine the corporate payout trends in Canada, aggregate data is generated by calendar year on dividend expenditures, share repurchase expenditures, total earnings, and total market value of equity. The results in Table 10 are based on all firm-year observations in the Stock Guide database over the period 1987 to 2001 with available information on the following variables: REPO, DIV, EARN, MV, and TPAY.

REPO is the expenditure on the purchase of common stocks. This data was originally sourced from Compustat and matched to the Stock Guide. DIV is the total dollar amount of dividends declared on common stocks. EARN is the earnings before extraordinary items and includes only firms with positive earnings. MV is the market value of common stocks comprising the product of common shares at close of year and market price at close of year. TPAY is the sum of the total dollar amount of common dividends and the total expenditure on the purchase of common stocks. The data sample contains 28,335 firm-year observations and the summation ($\sum_i$) represents the aggregation of data by calendar year in millions of dollars.

Over the fifteen year period from 1987 to 2001, the prominence of dividends as a payout option has dwindled in the Canadian market while the use of share repurchases has grown significantly.

Table 10 Panel A: Aggregate cash distribution to equity holders

Year	Σ_i EARN	Σ_i MV	Σ_i DIV	Σ_i REPO	Σ_i TPAY	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{EARN}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{EARN}}$ %	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{MV}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{DIV}}$ %	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{TPAY}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{TPAY}}$ %
1987	16,883	224,370	7,412	1,287	8,699	43.90	7.62	3.30	17.36	85.21	14.79
1988	23,443	272,891	9,952	2,286	12,239	42.45	9.75	3.65	22.97	81.31	18.68
1989	19,931	287,561	9,864	1,437	11,300	49.49	7.21	3.43	14.57	87.29	12.72
1990	21,641	292,787	10,572	776	11,348	48.85	3.59	3.61	7.34	93.16	6.84
1991	13,693	326,598	11,822	457	12,279	86.34	3.34	3.62	3.86	96.28	3.72
1992	12,324	295,528	8,143	835	8,978	66.08	6.77	2.76	10.25	90.70	9.30
1993	12,415	346,638	7,532	1,497	9,029	60.67	12.06	2.17	19.87	83.42	16.58
1994	23,807	382,841	8,927	1,693	10,620	37.50	7.11	2.33	18.97	84.06	15.94
1995	33,256	442,653	9,232	3,866	13,098	27.76	11.63	2.09	41.88	70.48	29.52
1996	32,835	603,471	10,660	7,953	18,613	32.47	24.22	1.77	74.60	57.27	42.73
1997	39,794	747,609	12,276	6,882	19,157	30.85	17.29	1.64	56.06	64.08	35.92
1998	45,448	789,000	14,175	4,719	18,894	31.19	10.38	1.80	33.29	75.02	24.98
1999	48,656	1,132,376	14,789	5,384	20,173	30.39	11.07	1.31	36.40	73.31	26.69
2000	67,871	1,372,222	16,992	10,919	27,911	25.04	16.09	1.24	64.26	60.88	39.12
2001	49,341	1,016,074	19,062	9,406	28,468	38.63	19.06	1.88	49.35	66.96	33.04

The table 10 Panel A reports annual information on aggregate cash distributions to equity holders of all listed and delisted Canadian firms using aggregate data for MV, DIV and REPO except EARN that uses only positive earnings. The sample comprises all firm-year observations in the Stock Guide database over the period 1987 to 2001 with available information on the following variables: REPO, DIV, EARN, MV and TPAY. REPO is the expenditure on the purchase of common stocks (Data was originally sourced from Compustat and matched to the Stock Guide). DIV is the total dollar amount of dividends declared on common stocks, EARN is the earnings before extraordinary items and includes all firms. MV is the market value of common stocks comprising the product of common shares at close of year and market price at close of year. TPAY is the sum of the total dollar amount of common dividends and the total expenditure on the purchase of common stocks. The data sample contains 28,335 firm-year observations. Σ_i represents the aggregation of data by calendar year in millions of dollars.

As shown in Table 10 Panel A above, in 1987, share repurchase represented 7.62% of earnings while dividends represented 43.9%. Since then, the share repurchase program has gained prominence as a viable payout option. Starting from 1991 when the proportion of dividends to earnings peaked at 86.34% and the proportion of share repurchases to earnings bottomed at 3.34%, the dollar amount distributed through dividends has declined steadily to 38.63% as at 2001 while the dollar amount distributed through share repurchases has grown steadily to 19.06% as at 2001. Over the period from 1991 to 2001, the dollar amount distributed through dividends, as a proportion of earnings before extraordinary items, dropped by a significant 47.7%.

The pattern of inverse relationship between dividend and share repurchase activity is further depicted in figure 3(a) and 3(b) below. While dividend payouts have declined over the 15-year period, share repurchase payout ratios have shown appreciable growth at the same time. The discernible negative correlation between dividend payout ratios and share repurchase payout ratios over the sample period is a further evidence of the substitutability of dividends with share repurchases as a payout policy in Canadian corporations. Table 10 Panel A further shows that while the proportion of total payout attributable to dividends has declined from the peak of 96.28% in 1991 to 66.96% in 2001, the proportion of share repurchases to total payout has increased from the bottom of 3.72% in 1991 to 33.04% in 2001. At the same time, share repurchase as a proportion of dividends has increased from 3.86% in 1991 to 49.35% as at 2001.

Table 10 Panel B analyzes the changes in the pattern of share repurchase expenditures and cash dividends for negative earnings firms. For each year, only firms with negative earnings before extraordinary items are included in the sample of firms. Starting from 1987, the percentage of cash dividends to total payout was 99.5% and the percentage of share repurchase expenditure to total payout was 0.95%. However, by 2001, the proportion of cash dividends to total payout had dwindled to 26.06% while the proportion of share repurchase to total payout had grown to 73.94%. In dollar terms, the prominence of share repurchases is evidenced by the fact that in 1987 only Cdn. \$0.004 billion was spent on share repurchases by negative earnings firms while Cdn. \$0.437 billion was spent on dividends. However, by 2001 Cdn. \$3.13 billion was spent on share repurchases and only Cdn. \$1.104 billion was spent on cash dividends by the sample of firms. Thus, consistent with the positive earnings firms, Canadian firms with negative earnings have

substituted share repurchases for dividends as an alternative payout option over the period from 1987 to 2001.

Table 10 Panel B: Aggregate cash distribution to equity holders (negative earn)

Year	Σ_i EARN	Σ_i MV	Σ_i DIV	Σ_i REPO	Σ_i TPAY	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{MV}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{MV}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{DIV}}$ %	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{TPAY}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{TPAY}}$ %
1987	(1,053)	9,021	437	4	441	4.84	0.05	0.96	99.05	0.95
1988	(992)	6,664	194	60	254	2.91	0.89	30.72	76.50	23.50
1989	(1,336)	9,788	350	111	461	3.58	1.13	31.65	75.96	24.04
1990	(4,620)	17,462	554	119	673	3.17	0.68	21.53	82.28	17.72
1991	(11,493)	114,075	4,422	131	4,553	3.88	0.11	2.96	97.13	2.87
1992	(10,303)	70,684	2,016	35	2,050	2.85	0.05	1.71	98.32	1.68
1993	(8,032)	81,590	1,918	292	2,210	2.35	0.36	15.22	86.79	13.21
1994	(2,972)	30,029	141	84	225	0.47	0.28	59.41	62.73	37.27
1995	(4,729)	38,642	119	911	1,030	0.31	2.36	765.30	11.56	88.44
1996	(6,119)	62,835	318	3,464	3,781	0.51	5.51	1090.75	8.40	91.60
1997	(11,885)	92,799	1,245	2,174	3,419	1.34	2.34	174.68	36.41	63.59
1998	(18,206)	140,600	1,155	2,165	3,320	0.82	1.54	187.47	34.79	65.21
1999	(14,620)	332,911	1,464	1,032	2,497	0.44	0.31	70.50	58.65	41.35
2000	(22,476)	430,667	780	2,500	3,281	0.18	0.58	320.33	23.79	76.21
2001	(151,411)	213,012	1,104	3,131	4,235	0.52	1.47	283.66	26.06	73.94

The table 10 Panel B reports annual information on aggregate cash distributions to equity holders of all listed and delisted Canadian firms using only firms with negative earnings. The sample comprises all firm-year observations in the Stock Guide database over the period 1987 to 2001 with available information on the following variables: REPO, DIV, EARN, MV and TPAY. REPO is the expenditure on the purchase of common stocks (Data was originally sourced from Compustat and matched to the Stock Guide). DIV is the total dollar amount of dividends declared on common stocks. EARN is the earnings before extraordinary items and includes only firms with negative earnings. MV is the market value of common stocks comprising the product of common shares at close of year and market price at close of year. TPAY is the sum of the total dollar amount of common dividends and the total expenditure on the purchase of common stocks. The data sample contains 28,335 firm-year observations. Σ_i represents the aggregation of data by calendar year in millions of dollars.

Table 10 Panel C below is an analysis of dividends and share repurchases for only firms that have positive earnings. In contrast to Panel C, firms with positive earnings generally spend a greater proportion of cash to pay dividends than expenditure on share repurchases. Cash dividends as a proportion of total payout was 96.32% in 1987 and decreased to 77.5% in 2001, representing 18.57% decline, while share repurchase expenditure as a proportion to total payout increased from 3.68% in 1987 to 22.25% in 2001, representing 18.57% growth.

Table 10 Panel C: Aggregate cash distribution to equity holders (positive earn)

Year	Σ_i EARN	Σ_i MV	Σ_i DIV	Σ_i REPO	Σ_i TPAY	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{MV}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{MV}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{DIV}}$ %	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{TPAY}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{TPAY}}$ %
1987	16,883	215,316	6,975	266	7,241	3.24	0.12	3.82	96.32	3.68
1988	23,443	266,210	9,759	139	9,897	3.67	0.05	1.42	98.60	1.40
1989	19,931	277,744	9,513	450	9,963	3.43	0.16	4.73	95.48	4.52
1990	21,641	275,296	10,018	198	10,216	3.64	0.07	1.98	98.06	1.94
1991	13,693	212,494	7,400	20	7,419	3.48	0.01	0.27	99.73	0.27
1992	12,324	224,828	6,128	309	6,436	2.73	0.14	5.04	95.20	4.80
1993	12,415	265,048	5,614	522	6,136	2.12	0.20	9.30	91.49	8.51
1994	23,807	352,811	8,786	564	9,350	2.49	0.16	6.42	93.97	6.03
1995	33,256	404,011	9,113	2,207	11,320	2.26	0.55	24.22	80.50	19.50
1996	32,835	540,525	10,343	3,416	13,758	1.91	0.63	33.03	75.17	24.83
1997	39,794	654,783	11,031	3,674	14,705	1.68	0.56	33.30	75.02	24.98
1998	45,448	648,400	13,021	2,407	15,427	2.01	0.37	18.48	84.40	15.60
1999	48,656	799,255	13,325	4,341	17,665	1.67	0.54	32.58	75.43	24.57
2000	67,871	941,677	16,211	8,059	24,270	1.72	0.86	49.71	66.80	33.20
2001	49,341	803,062	17,958	5,138	23,096	2.24	0.64	28.61	77.75	22.25

The table 10 Panel C reports annual information on aggregate cash distributions to equity holders of all listed and delisted Canadian firms using only firms with positive earnings. The sample comprises all firm-year observations in the Stock Guide database over the period 1987 to 2001 with available information on the following variables: REPO, DIV, EARN, MV and TPAY. REPO is the expenditure on the purchase of common stocks (Data was originally sourced from Compustat and matched to the Stock Guide). DIV is the total dollar amount of dividends declared on common stocks, EARN is the earnings before extraordinary items and includes only firms with positive earnings. MV is the market value of common stocks comprising the product of common shares at close of year and market price at close of year. TPAY is the sum of the total dollar amount of common dividends and the total expenditure on the purchase of common stocks. The data sample contains 28,335 firm-year observations. Σ_i represents the aggregation of data by calendar year in millions of dollars.

The 18.57% decline in the proportion of dividend to total payout of firms with positive earnings is important given that firms which are generally predisposed to pay dividends are those which generate positive earnings. The documented decline in dividend payments of firms with positive earnings is therefore a further confirmation of the dividend disappearance hypothesis. It is equally important to note that the 18.57% increase in the proportion of share repurchase to total payout of firms with positive earnings mirrors the decline in dividend to total payout ratio and provides further credence to the substitution of share repurchase for dividends hypothesis.

Table 10 Panel D: Mean cash distribution to equity holders (positive earn)

Year	MEARN	MMV	MDIV	MREPO	MTPAY	MDIV/ MMV %	MREPO/ MMV %	MREPO/ MDIV %	MDIV/ MTPAY %	MREPO/ MTPAY %
1987	64	882	27	6	32	3.01	0.64	21.35	82.40	17.60
1988	85	1,024	35	3	38	3.45	0.30	8.72	91.98	8.02
1989	68	978	32	10	42	3.32	1.00	30.12	76.85	23.15
1990	63	839	29	4	33	3.47	0.44	12.82	88.64	11.36
1991	36	634	19	0	20	3.06	0.07	2.38	97.68	2.32
1992	25	530	12	4	17	2.33	0.83	35.77	73.65	26.35
1993	20	471	9	5	14	1.90	1.05	54.99	64.52	35.48
1994	34	538	12	3	16	2.30	0.62	26.93	78.78	21.22
1995	44	615	12	9	21	1.95	1.44	73.83	57.53	42.47
1996	40	732	13	12	25	1.72	1.64	95.37	51.18	48.82
1997	48	877	13	11	25	1.52	1.29	85.11	54.02	45.98
1998	59	944	17	6	23	1.80	0.64	35.62	73.74	26.26
1999	62	1,095	17	9	26	1.56	0.78	49.99	66.67	33.33
2000	91	1,319	22	18	39	1.65	1.33	80.58	55.38	44.62
2001	83	1,361	30	16	46	2.22	1.19	53.61	65.10	34.90

The table 10 Panel D reports annual information on mean cash distributions to equity holders of all listed and delisted Canadian firms using only firms with positive earnings. The sample comprises all firm-year observations in the Stock Guide database over the period 1987 to 2001 with available information on the following variables: MREPO, MDIV, MEARN, MMV and MTPAY. MREPO is the mean expenditure on the purchase of common stocks (Data was originally sourced from Compustat and matched to the Stock Guide). MDIV is the mean dollar amount of dividends declared on common stocks, MEARN is the mean earnings before extraordinary items and includes only firms with positive earnings. MMV is the mean market value of common stocks comprising the product of common shares at close of year and market price at close of year. MTPAY is the mean total dollar amount of common dividends and total expenditure on the purchase of common stocks. The data sample contains 28,335 firm-year observations. M represents the mean of data by calendar year in millions of dollars.

Table 10 Panel D and figure 4(a) and 4(b) show the mean payout trends for firms with positive earnings only. Consistent with table 10 Panel C, table 10 Panel D shows that the mean dividend paid as a proportion of mean total payout declined by 17.3% from 82.4% in 1987 to 65.1% in 2001, while the mean share repurchase as a proportion of mean total payout grew by 17.3% from 17.6% in 1987 to 34.9% in 2001. Table 10 Panel D further confirms that firms with positive earnings experienced disappearance of dividends and may likely have substituted dividends with share repurchases.

To further validate the noticeable substitution of share repurchases for dividends in Canada, we examine the differences in characteristics of firm which use share repurchases only and those that use dividends and share repurchases in terms of their size, volatility in profitability, investment opportunity, profitability and leverage⁵⁸. As noted by Grullon and Michaely (2002), the apparent substitution effect of share repurchases for dividends could be caused only by differences in firm characteristics. They argue that firms may decide to repurchase shares after experiencing an increase in earnings volatility, and that the resulting spurious correlation between the dividends forecast error and share repurchase activity may be driven by such differences in the firm characteristics. Hence, from the foregoing argument, it is expected that firms who are substituting share repurchase for dividends would have greater earnings volatility and weaker financial strength than firms who pay dividends.

Table 10 Panel E shows the characteristics of firms using share repurchases only versus a combination of share repurchase and dividend paying firms, selected in accordance with Grullon and Michaely (2002). Several observations are apparent. Firstly, even after smoothing the size measure by taking the natural log of market capitalization, the size of firm tends to be smaller on average for firms using share repurchase only than firms using share repurchase and dividends. Secondly, share repurchase only firms have mean negative return on assets and mean negative net profit ratio for all the years of the study except 1987, whereas the mean return on assets for firms using dividends and share repurchases are positive for all periods from 1987 to 2001 and the

⁵⁸ Lintner (1956) documented that a firm's dividend policy is a function of its targeted payout ratio and the speed of adjustment of current dividends. If firms are substituting share repurchase for dividends, then we should observe a negative correlation between the dividend forecast errors i.e., actual dividends minus expected dividends, and share repurchase activity. Share repurchase activity is measured by share repurchase yield which is defined as total repurchase expenditure divided by market capitalization value. The Lintner model is not implemented in this study, rather, this study uses the implications of the characteristics of firms to confirm the substitution of share repurchases for dividends.

mean net profit ratio are only negative in 1991 and 1992. This implies that firms using only share repurchases tend to have high earnings volatility and it is therefore not surprising that they resort to the use of share repurchases since the use of share repurchases preserves financial flexibility relative to dividends, according to Jagannathan, Stephens and Weisbach (2000). Thirdly, firms that use share repurchases have larger leverage than those that use share repurchase and dividends. Fourthly, firms using share repurchases only have larger investment opportunities, measured by the high mean market-to-book ratio, in comparison with firms that use share repurchases and dividends. This implies that firms that tend to use share repurchases only are under-investing in nature while firms using dividends tend to be over-investing.

From the foregoing, the negative relationship between firms which use share repurchases only and firms using share repurchases and dividend, in terms of measures such as earnings volatility, leverage and investment opportunities, supports the substitution hypothesis. Moreover, the substitution of share repurchases for dividends is further revealed by a comparison of share repurchase yield, measured by the percentage of share repurchase expenditure to total market value and dividend yield, measure by the percentage of dividend expenditure to total market value. Table 10 panel A to D reveal a consistent decline in dividend yield between 1987 to 2001 and a simultaneous and consistent increase in share repurchase yield over the same period, regardless of whether the sample is just firms with positive earnings only, or firms with negative earnings alone.

Table 10 Panel E: Mean characteristics of firms using repurchases only versus those using dividends

Repurchases only															
Mean	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Size	9.68	9.88	9.23	9.30	10.56	10.28	11.06	11.26	11.22	11.32	11.09	10.88	11.05	11.25	10.94
Return on Assets	4.35	-13.11	-4.50	-9.97	-10.92	-1.42	-3.71	-12.47	-1.78	-9.13	-23.36	-15.20	-10.91	-5.44	-13.35
Debt Ratio	0.27	0.30	0.36	0.35	0.41	0.39	0.36	55.86	0.42	16.21	12.22	17.23	6.33	18.23	28.04
Net Profit Ratio	11.16	-73.57	-2.88	-38.38	-34.21	-45.97	-37.99	-83.55	-39.96	-86.60	-101.80	-90.96	-86.00	-43.57	-63.20
Market-to-Book Ratio	167.92	8.51	112.34	64.32	144.63	4.33	86.43	102.80	57.51	81.66	68.61	88.28	80.80	59.50	67.95
Dividends only															
Mean	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Size	12.18	12.11	12.10	11.93	12.07	12.23	12.48	12.41	12.44	12.69	12.98	13.04	13.00	12.88	13.19
Return on Assets	6.88	5.36	4.88	2.57	0.41	1.53	4.29	4.93	5.17	4.84	5.12	3.48	4.69	6.69	4.24
Debt Ratio	0.24	0.26	0.29	0.29	0.30	0.30	0.26	0.27	0.28	0.28	0.29	0.29	0.30	0.29	0.30
Net Profit Ratio	10.31	5.37	7.84	2.44	-5.17	-4.83	3.96	6.09	6.32	16.00	9.98	5.81	10.01	9.48	10.70
Market-to-Book Ratio	2.24	1.87	2.26	1.42	9.42	5.81	6.11	9.54	5.70	1.88	6.03	6.03	1.93	1.85	6.48
Dividend payers who also repurchase shares															
Mean	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Size	12.21	12.13	12.13	11.97	12.09	12.26	12.50	12.46	12.51	12.70	12.99	12.99	13.01	12.96	13.26
Return on Assets	6.84	5.35	4.77	2.57	0.45	1.58	4.19	4.88	5.17	4.93	5.22	3.65	4.55	6.05	4.52
Debt Ratio	0.25	0.26	0.29	0.29	0.30	0.30	0.27	0.28	0.28	0.28	0.29	0.29	0.30	0.30	0.30
Net Profit Ratio	10.52	10.60	7.60	2.50	-4.69	-4.57	3.97	6.33	6.61	15.64	11.50	6.25	10.32	9.51	12.30
Market-to-Book Ratio	2.19	1.85	6.72	1.41	9.23	5.68	5.95	9.07	5.42	1.90	5.57	5.43	1.86	8.98	5.79

From the foregoing discussion, the pattern of share repurchases expenditures and cash dividends paid to shareholders on the Canadian market are similar to the findings of Grullon and Michaely (2002) on the U.S. market. Grullon and Michaely (2002) have argued that on the basis of sources and uses of funds identity, share repurchases and dividends should be substitute payout methods. They provide evidence that corporations have indeed been substituting share repurchases for dividends. Using the Lintner's (1956) dividend model to generate expected future dividend payments, they find that dividend forecast errors are negatively correlated with share repurchase activity, further confirming that share repurchases and dividends are substitutes. This study has used the analysis of firm characteristics to provide further support to the observation that Canadian firms have substituted share repurchases for dividends over the sample period.

The key observation from the trends in corporate payout in Canada is that share repurchase activities have gained prominence during the period from 1987 to 2001. During this period, the proportion of share repurchase to total payout generally increased from 3.72% in 1991 to 33.04% in 2001 (42.73% in 1996) while the proportion of dividends to total payout has declined from 96.28% in 1991 to 66.96% in 2001 (57.27% in 1996). These results are also consistent with the declining dividend payout ratios and dividend yields, respectively. The growth in the proportionate use of share repurchases to total payout from 0.95% in 1987 to 73.94% in 2001 instead of dividends as a payout option by firms with negative earnings is equally consistent with the findings of Jagannathan, Stephens and Weisbach (2000). The authors concluded that firms with worse operating income paid less dividends while firms with higher standard deviation of operating income had a higher probability of utilizing share repurchases, further demonstrating that share repurchase is often used as a way of preserving financial flexibility.

It is equally important to note that although firms with positive earnings tend to pay higher dividends than share repurchases over the sample period, the proportion of share repurchase expenditure to total outlay grows from 3.68% in 1987 to 22.25% in 2001 (33.20% in 2000). The growth in the proportion of share repurchase to total payout of 18.57% mirrors the decline in dividend as a proportion of total payout of firms with positive earnings. The same conclusion is equally drawn from the mean-based payout analysis of firms with positive earnings.

The results discussed above have confirmed that as the proportion of share repurchased to total payout in Canada increased over the sample period, the proportion of dividends to total payout declined at the same time because share repurchase and dividends appear to be used as payout substitutes by Canadian firms.

Fig 3(a) Cash distribution to equity holders. The figure displays the average dividend payout ratio, average repurchase payout ratio and total payout ratio for the sample of Canadian firms. Each is derived by taking the proportion of the total dollar amount of payout to the total dollar amount of earnings before extraordinary items. The sample comprises all firm-year observations in the Stock Guide database over the period 1987 to 2001 with available information on the following variables: REPO, DIV, EARN, and TPAY. REPO is the expenditure on the purchase of common stocks (Data was originally sourced from Compustat and matched to the Stock Guide). DIV is the total dollar amount of dividends declared on common stocks. EARN is the earnings before extraordinary items and includes only firms with positive earnings. TPAY is the sum of the total dollar amount of common dividends and the total expenditure on the purchase of common stocks

Fig. 3(b) Payout Trends

Fig 3(b). Trends in Payout Options. Repurchase to Total Payout represents the proportion of the total dollar amount of share repurchases to Total Payout, while Dividends to Total Payout represents the proportion of the total dollar amount of dividends declared to Total Payout. The sample comprises all firm-year observations in the Stock Guide database over the period 1987 to 2001 with available information on the following variables: REPO, DIV, and TPAY. REPO is the expenditure on the purchase of common stocks (Data was originally sourced from Compustat and matched to the Stock Guide). DIV is the total dollar amount of dividends declared on common stocks, TPAY is the sum of the total dollar amount of common dividends and the total expenditure on the purchase of common stocks.

Fig 4(a) Mean Cash Distribution of firms with positive earnings

Fig 4(b) Mean Payout Trends of firms with Positive Earnings

4.2.3 Characteristics of dividend payers and share repurchase activity

The objective of this segment of the study is to analyze the key characteristics of dividend paying firms and share repurchase firms. The selection of the characteristics is based on the results from similar empirical studies conducted by Fama and French (2001), Grullon and Michaely (2002). This segment of the study will also provide an assessment of the impact of earnings volatility on dividends and share repurchases.

4.2.3.1 Key firm characteristics

Table 11 and table 12 provide a summary of the key characteristics of the firms that do pay dividends and those that do engage in share repurchase activities, respectively. For the purpose of determining the characteristics of firms that do pay dividends, only firms that declare dividends in the year in question are used in the analysis. In the same way, only firms that engage in share repurchase expenditure activity in the particular year are used in the analysis for determining the characteristics of the firms. Fama and French (2001) examined the characteristics of dividend payers in the U.S. market based on profitability, investment opportunities, and size but not earnings volatility. They concluded that dividend payers have higher measured profitability than non-payers and are much larger in size than non-payers. However, in terms of investment opportunities, firms that never paid dividends have better growth opportunities than dividend payers. Grullon and Michaely (2002) also confirmed that dividend-paying firms are much larger and more profitable than firms that do not pay dividends. They further confirmed that firms that pay dividends have lower variability of return on assets than firms that do not pay dividends. Consistent with Jagannathan et al (2000), Grullon and Michaely (2002) found that firms that only repurchase shares have higher earnings volatility than firms that only pay dividends.

Profitability

First, the average return on assets of the firms that engage in share repurchase activity is consistently negative throughout the sample period with a maximum average returns of -13.77% in 1997 and an average over the period of -4.28%. On the contrary, firms that pay dividends have positive return on assets throughout the sample period. The maximum average returns is 6.84% in 1987 and the average over the sample period is 4.32%. Consistent with the findings in the US market, earnings volatility, measured by the standard deviation of return on assets, are higher in the case of firms that engage in share repurchase activity than those that pay dividends. Whereas the maximum earnings volatility of firms engaged in share repurchase activity was 62.37 in 1997, with an average volatility over the entire sample period of 27.88, earnings volatility was a lot lower in the case of firms that pay dividends, i.e., maximum of 17.42 in 1991 and overall average of 10.91. The Canadian results are therefore consistent with the findings on the US market, and validate the empirical and theoretical hypothesis that firms that repurchase shares do experience more volatility than those that pay dividends⁵⁹.

Investment Opportunities

Investment opportunities are measured by the ratio of market price of share to book value. Higher price-to-book ratios are symptomatic of growth potential while lower price-to-book ratios indicate non-growth potential. Consistent with the findings of Fama and French (2001), the average price-to-book ratio for firms engaged in share repurchase activity was 54.69% with the maximum average price-to-book ratio of 92.39% in 1991, while the average price-to-book ratio over the entire sample period for firms that pay dividends was 5.14% with the maximum average price-to-

⁵⁹ Using the paired sample test, the mean paired difference in earnings volatility for firms that repurchase shares and firms that pay dividends is 16.97 and the difference is statistically significant at t-statistic of 3.558.

book ratio of 9.23% in 1991. The implication of this finding is that firms that engage in dividend payments have lower growth potential than those that engage in share repurchase.

Size

Consistent with the findings of Fama and French (2001), Grullon and Michaely (2002), firms that pay dividends are much larger than firms that engage in share repurchase activity. Using market capitalization, total assets and total revenue as size measures, the average market capitalization, total assets and total revenue for firms that pay dividend were Cdn. \$1,675 million, Cdn. \$2,972 million and Cdn. \$1,729 million, respectively. On the contrary, the size measure for firms who engage in share repurchase activity were a lot smaller i.e., Cdn. \$911 million, Cdn. \$ 1,086 million, and Cdn. \$1,104 million, respectively.

Cash Flow

The Canadian sample also indicates that firms that pay dividends tend to have higher cash balances and generate greater positive cash flow from operations than firms that engage in share repurchase activity. Over the sample period, firms that pay dividends have an average cash balance of Cdn. \$357 million and generate Cdn. \$205 million from operations. On the other hand, firms that engage in share repurchase activity have average cash balance of Cdn \$132 million and generate Cdn \$149 million cash from operations. The implication is that firms that pay dividends are more liquid than those that engage in share repurchases. The foregoing observation is consistent with the findings of Jagannathan, Stephens and Weisbach (2000) who concluded that firms use share repurchases instead of dividend payment because it is more responsive to

potential future liquidity constraints than dividend payments. Repurchases thus preserve financial flexibility relative to dividends because it does not implicitly commit the firm to future payouts.

Table 11: Characteristics of firms that repurchase shares in the year in question

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Mean															
Return on Assets	5.40	-5.47	-0.71	-3.87	-6.62	-0.42	-1.45	-6.65	0.57	-4.18	-13.77	-9.26	-6.77	-2.87	-8.08
Market Capitalization	911,052	639,828	970,443	770,413	981,954	651,338	983,809	1,081,305	1,161,702	902,774	1,191,664	574,586	803,764	1,217,320	833,143
Price to Book Ratio	67.96	5.95	106.54	33.77	92.39	36.60	58.21	64.87	36.73	51.55	45.81	61.11	57.96	51.53	49.30
Total Assets	443,951	911,414	980,293	888,337	444,522	1,265,367	379,074	430,712	717,491	439,496	850,009	2,293,262	1,925,941	1,782,036	2,533,09
Cash	27,324	16,245	23,025	303,766	32,900	19,308	230,232	538,795	256,205	51,027	68,845	43,748	145,437	133,753	96,776
Total Revenue	1,904,784	1,150,940	1,892,647	1,376,226	1,049,501	1,159,133	1,026,042	1,155,085	925,305	710,862	805,630	726,107	688,905	1,017,368	980,290
Cash From Operations	241,041	136,080	220,241	196,495	192,107	158,335	160,185	178,619	150,374	75,804	118,552	80,228	80,624	148,805	102,997
Capital Expenditures	(225,370)	(146,097)	(221,207)	(151,223)	(177,609)	(144,831)	(137,024)	(108,013)	(102,340)	(75,564)	(110,357)	(103,252)	(62,719)	(99,626)	(81,966)
Median															
Return on Assets	5.26	2.00	1.25	0.77	-1.28	1.59	3.00	3.91	3.81	3.40	1.58	1.55	2.35	2.52	1.46
Market Capitalization	162,298	29,436	30,684	58,015	105,503	56,655	167,977	149,337	179,357	129,057	119,436	74,902	92,494	105,838	91,169
Price to Book Ratio	1.41	1.35	1.34	1.06	1.01	1.43	1.84	1.77	1.79	1.93	2.26	1.63	1.70	1.85	1.58
Total Assets	33,257	103,982	238,756	262,387	78,423	70,007	97,873	62,519	58,722	47,080	80,282	68,951	65,531	66,516	66,366
Cash	11,262	2,551	2,833	2,142	2,244	1,432	640	818	2,361	2,721	3,751	1,943	3,371	4,485	6,386
Total Revenue	86,572	27,498	79,049	42,005	38,587	38,291	50,399	72,905	71,352	54,216	66,156	72,889	79,609	81,018	88,460
Cash From Operations	6,533	3,330	2,503	8,097	1,372	2,956	4,933	10,079	8,545	5,714	4,787	5,598	7,775	7,664	8,517
Capital Expenditures	(8,087)	(4,271)	(6,126)	(4,853)	(4,293)	(3,512)	(9,236)	(9,018)	(7,130)	(3,724)	(6,319)	(4,002)	(5,195)	(6,652)	(6,497)
Stan Dev of ROA	3.84	24.07	14.18	14.14	15.42	11.86	25.60	58.32	17.33	35.13	62.37	37.38	38.55	26.48	33.52
Sample Size	15	24	20	32	25	34	40	56	75	96	126	171	228	233	150

Table 12: Firms that declare dividends in the year in question

Mean	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Return on Assets	6.84	5.35	4.77	2.57	0.45	1.58	4.19	4.88	5.17	4.93	5.22	3.65	4.55	6.05	4.52
Market Capitalization	1,292,182	1,344,629	1,232,817	1,095,621	1,109,678	979,455	1,032,868	1,030,842	1,167,795	1,486,157	1,972,031	2,112,432	3,006,562	3,255,647	3,015,04
Price to Book Ratio	2.19	1.85	6.72	1.41	9.23	5.68	5.95	9.07	5.42	1.90	5.57	5.43	1.86	8.98	5.79
Total Assets	2,567,008	4,300,085	3,268,244	3,305,522	3,147,922	3,038,887	1,943,120	1,779,887	2,238,917	2,436,040	2,755,738	3,378,213	3,312,644	3,400,341	3,702,00
Cash	391,144	350,043	288,950	278,356	271,320	268,237	238,667	312,155	357,148	347,711	423,479	394,862	460,090	446,268	523,872
Total Revenue	1,516,900	1,655,313	1,652,794	1,659,430	1,494,664	1,326,370	1,137,320	1,264,061	1,338,808	1,400,690	1,634,537	1,909,596	2,157,693	2,759,650	3,026,93
Cash From Operations	176,986	204,256	188,760	189,431	162,416	165,139	128,615	152,081	167,468	177,784	206,340	224,113	253,099	361,429	319,907
Capital Expenditures	(104,074)	(127,377)	(134,164)	(131,976)	(120,249)	(92,366)	(80,160)	(85,856)	(96,197)	(118,648)	(142,691)	(179,558)	(178,962)	(206,060)	(280,006)
Median	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Return on Assets	5.96	4.48	4.08	3.53	1.63	2.80	3.69	4.50	4.42	4.57	4.15	4.19	4.06	4.61	3.89
Market Capitalization	169,495	164,348	153,905	143,483	168,832	218,216	269,877	268,830	271,830	324,000	482,067	473,586	477,841	420,000	633,896
Price to Book Ratio	1.48	1.32	1.40	1.10	1.22	1.31	1.58	1.49	1.34	1.48	1.64	1.53	1.41	1.39	1.51
Total Assets	171,509	219,519	199,126	257,649	271,734	235,304	212,197	175,616	138,800	162,525	200,008	154,683	126,330	114,655	120,947
Cash	7,184	6,364	5,231	5,100	5,215	8,349	7,022	8,840	8,036	12,249	19,543	17,597	13,074	16,506	20,008
Total Revenue	220,036	257,461	256,551	241,112	213,398	237,452	247,275	289,213	281,841	290,380	349,878	396,681	448,527	483,994	610,899
Cash From Operations	15,956	18,531	18,581	17,608	14,445	19,254	23,090	28,587	30,096	35,199	50,586	46,091	54,193	61,777	71,608
Capital Expenditures	(10,232)	(11,395)	(11,298)	(12,228)	(9,751)	(10,234)	(11,325)	(14,282)	(16,925)	(19,442)	(23,812)	(29,915)	(28,114)	(19,286)	(30,657)
Stan Dev of ROA	7.72	9.54	8.75	13.93	17.42	17.09	8.09	7.39	10.15	9.69	7.47	9.80	9.14	14.78	12.63
Sample Size	175	204	228	260	280	276	272	284	302	320	308	306	292	288	259

The Canadian evidence suggests that the four fundamental factors – profitability, investment opportunities, size, and cash flow - are important factors that influence the decision to pay dividends or the decision to repurchase shares. Firms who engage in the use of share repurchases are less profitable, have greater investment growth potential, tend to be smaller in size, and generate lower cash flow. On the contrary, firms who pay dividends are more profitable, have lower investment opportunities, tend to be larger in size, and generate higher cash flow from operations. These results are consistent with Fama and French (2001).

4.2.3.2 Earnings volatility analysis

The examination of the relationship between earnings volatility and the payout policy adopted by the firm is important given the possibility that firms with higher earnings volatility may tend to pay out more using share repurchases than dividends. As noted by Jagannathan, Stephens and Weisbach (2000), firms with worse operating income paid less dividends while firms with higher standard deviation of operating income had a higher probability of utilizing share repurchases as a means of preserving financial flexibility. Grullon and Michaely (2002) use the Return on Assets as the measure of profitability and the standard deviation of Return on Assets as the proxy for earnings volatility.

This study uses the Grullon and Michaely (2002) approach to earnings volatility by segregating the Canadian sample of listed and delisted firms into three five-year periods of 1987 to 1991, 1992 to 1996, and 1997 to 2001, respectively, using the standard deviation of Return on Assets⁶⁰. For each five year period, the standard deviation of the return on assets of each firm is calculated and used to segregate the firms into two equal groups of low earnings volatility firms and high earnings volatility firms.

A review of table 13, table 14 and figure 5 reveal a consistent pattern of disappearance of dividends with respect to high earnings volatility firms and low earnings volatility firms. What is, striking however, is that over the period of the sample study when dividends are declining, the low earnings volatility firms tend to experience proportionately higher

⁶⁰ The segregation of the data into 5-year time period was done partly for analytical convenience and partly to correspond to typical 5-year economic cycles.

dividend payers compared to high earnings volatility firms and the rate of decline is much greater for high earnings volatility firms. For instance, whereas the proportion of dividend payers of firms with low earnings volatility declines from 69% in 1987 to 40% by 2001, the proportion of dividend payers for firms with high earnings volatility declines from 40% to 7%, respectively.

The economic rationale behind the proportionately higher decline in dividends in firms with higher earnings volatility is premised on the very nature of corporate dividend policy. Corporate dividend policy tends to be a relatively permanent commitment to shareholders to pay dividends, based on reasonable predictability of earnings. Corporate dividends however, tends to be “sticky”, according to Fama and French (2002), in that it does not vary much in the short run, although it does vary in the long run. Dividends are also paid from excess profits and firms with higher earnings volatility have less predictability of earnings. Hence, firms with high earnings volatility have a greater difficulty keeping dividend commitments than firms with lower earnings volatility. It is therefore not surprising that firms with higher earnings volatility experienced proportionately greater decline in dividends.

Table 13: Count of dividend payers and non payers based on earnings volatility

Low Volatility (Count)	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Payers	109	124	138	173	164	189	200	207	220	213	247	250	237	232	213
Non-Payers	50	57	73	107	116	213	249	277	330	311	370	422	403	354	316
All	159	181	211	280	280	402	449	484	550	524	617	672	640	586	529
High Volatility (Count)	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Payers	66	80	90	87	78	75	72	77	82	79	50	56	55	56	44
Non-Payers	99	116	142	193	202	316	380	421	476	441	526	600	634	601	543
All	165	196	232	280	280	391	452	498	558	520	576	656	689	657	587

Table 14: Proportion of dividend payers and non payers based on earnings volatility

Low Volatility (Percent)	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Proportion of Payers	0.69	0.69	0.65	0.62	0.59	0.47	0.45	0.43	0.40	0.41	0.40	0.37	0.37	0.40	0.40
Proportion of Non Payers	0.31	0.31	0.35	0.38	0.41	0.53	0.55	0.57	0.60	0.59	0.60	0.63	0.63	0.60	0.60
High Volatility (Percent)	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Proportion of Payers	0.40	0.41	0.39	0.31	0.28	0.19	0.16	0.15	0.15	0.15	0.09	0.09	0.08	0.09	0.07
Proportion of Non Payers	0.60	0.59	0.61	0.69	0.72	0.81	0.84	0.85	0.85	0.85	0.91	0.91	0.92	0.91	0.93

Fig 5. Proportion of Payer of Dividends based on Earnings Volatility

With respect to Panel A of table 15, it is observed that low earnings volatility firms tend to pay higher dividends in terms of mean dividend paid, have higher mean dividend yields, and usually spend higher amount of funds on share repurchases. On the other hand, high earnings volatility firms in Panel B of Table 15 tend to spend less on dividends, have lower dividend yields, and spend considerably less on share repurchases. The foregoing observation in the Canadian market is consistent with the U.S. market in that Grullon and Michaely (2002) observed that firms that pay dividends have a lower variability of return on assets regardless of their repurchase policy. Moreover, the authors observed that firms that only repurchase shares have higher earnings volatility than firms that only pay dividends.

Finally, Panels A and B of Table 16 and figures 6 and 7 show the aggregate cash distribution to equity-holders of low earnings volatility firms and high earnings volatility firms, respectively. There are several key observations from the tables and figures. Firstly, low earnings volatility firms spend a considerably higher amount of their scarce resource on dividends while high earnings volatility firms spend a considerably lower amount on dividends. The same conclusion is drawn with respect to funds spent on share repurchases. Over the period from 1987 to 2001, low earnings volatility firms spent Cdn. \$144.6 billion on dividends and Cdn. \$29.5 billion on share repurchases while high earnings volatility firms spent on Cdn. \$24.1 billion on dividends and Cdn. \$ 22.8 billion on share repurchases. Secondly, the proportion of dividends to total payout have declined over the study period, however, the decline is more pronounced with respect to high earnings volatility firms than low earnings volatility firms. For instance, the dividend to

total payout ratio for the low earnings volatility firms was 92.37% in 1987 and declined to 75.25% by 2001, whereas the same ratio was 62.82% for high earnings volatility firms in 1987 and declined to 39.24% by 2001. Thirdly, the proportion of share repurchases to total payout increased over the study period for low earnings volatility and high earnings volatility firms, however, the magnitude of increase was higher in the latter than the former. The proportion of share repurchases to total payout for low earnings volatility firms increased from 7.63% in 1987 to 24.75% by 2001 (31.29% in 2000) while, with respect to high earnings volatility firms, the proportion of share repurchase to total payout increased from 37.18% in 1987 to 60.76% in 2001 (71.23% in 1996). Hence, high earnings volatility firms tend to spend proportionately a higher percentage of the payout amount on share repurchases instead of dividends, while low earnings volatility firms spend a considerably higher percentage of their payout amount on dividends instead of share repurchases. It is, however, noted that share repurchases generally have gained prominence in terms of the proportion of the payout amount allocated to it over the study period regardless of whether the firms in question are either low or high earnings volatility in nature.

In summary, low earnings volatility firms in Canada are bigger dividend payers than higher earnings volatility firms, regardless of the share repurchase policy they pursue. Low earnings volatility firms tend to have positive and stable earnings and larger market capitalization and therefore can afford to follow established dividend policy. On the other hand, high earnings volatility firms tend to experience periodic negative earnings, have relatively lower market capitalization, and tend to spend relatively higher proportion of

their payout amount on share repurchases rather than on dividends. These observations in the Canadian market are consistent with the U.S. market.

Table 15 Panel A: Characteristics of low earnings volatility firms paying dividends and repurchasing shares

Low Earnings Volatility	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Dividend Paid \$mln (Mean)	42.90	43.40	41.88	33.84	35.52	14.99	14.30	15.94	14.26	16.28	16.59	17.54	19.17	24.55	31.11
Dividend Yield % (Mean)	2.16	2.92	2.95	2.56	2.55	1.81	1.12	1.35	1.29	1.18	1.04	1.25	1.44	1.45	1.80
Dividend Payout % (Mean)	39.41	54.35	74.83	81.55	94.40	83.99	71.10	58.83	54.27	55.96	56.65	72.80	64.35	52.19	72.06
Share Repurchase \$mln (Mean)	19.44	2.83	11.04	6.05	2.83	6.25	7.11	7.06	4.80	16.18	10.43	7.09	9.96	15.94	15.38
Dividend Paid \$mln (Total)	6,821	7,855	8,836	9,476	9,947	6,028	6,421	7,716	7,843	8,529	10,238	11,785	12,269	14,384	16,456
Share Repurchase \$mln (Total)	564	91	364	230	102	569	846	1,009	840	2,960	3,128	2,637	4,235	6,550	5,412
Earnings \$ mln	14,069	19,250	15,521	18,591	6,385	6,410	7,936	16,555	20,186	22,544	31,085	32,024	34,860	51,674	38,403
Market Capitalization \$mln	190,450	238,533	243,382	250,754	259,409	187,553	253,723	271,503	310,033	410,213	575,671	601,841	685,712	841,011	777,965

Table 15 Panel B: Characteristics of high earnings volatility firms paying dividends and repurchasing shares

High Earnings Volatility	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Dividend Paid \$mln (Mean)	3.58	10.70	4.43	3.91	4.30	2.66	2.46	2.43	2.49	2.59	3.38	3.64	3.66	3.97	4.37
Dividend Yield % (Mean)	1.55	1.74	1.38	1.51	1.75	1.36	0.57	0.68	0.60	0.49	0.65	0.73	0.66	2.29	1.29
Dividend Payout % (Mean)	46.52	56.80	57.37	93.70	130.82	87.59	64.85	78.83	48.83	46.32	122.41	74.98	79.73	86.65	80.97
Share Repurchase \$mln (Mean)	8.97	10.99	6.50	1.94	1.07	0.60	4.23	1.28	14.32	19.83	13.20	5.93	2.76	11.04	12.23
Dividend Paid \$mln (Total)	591	2,098	1,027	1,096	1,203	1,040	1,111	1,211	1,389	1,346	1,947	2,391	2,520	2,607	2,568
Share Repurchase \$mln (Total)	350	473	293	87	48	44	432	166	2,278	3,332	3,747	2,039	1,144	4,362	3,975
Earnings \$ mln	1,760	3,201	3,074	(1,570)	(5,090)	(5,506)	(3,553)	4,280	8,341	1,665	(2,082)	(4,782)	(825)	(6,279)	(140,429)
Market Capitalization \$mln	33,919	34,358	44,179	42,033	45,509	63,093	92,914	111,338	132,621	155,523	156,411	187,160	446,475	531,335	237,836

Table 16 Panel A: Aggregate cash distribution to equityholder based on low earnings volatility

	Σ EARN	Σ MV	Σ DIV	Σ REPO	Σ TPAY	Dividend Payout Ratio	Repurchase Payout Ratio	Σ DIV/ Σ MV	Σ REPO/ Σ MV	Σ REPO/ Σ DIV	Total Payout Ratio	DIV/TPAY	Repo /TPAY
1987	14,069	190,450	6,820.8	563.8	7,384.6	48.48	4.01	3.58	0.30	8.27	52.49	92.37	7.63
1988	19,250	238,533	7,854.6	90.6	7,945.2	40.80	0.47	3.29	0.04	1.15	41.27	98.86	1.14
1989	15,521	243,382	8,836.5	364.3	9,200.7	56.93	2.35	3.63	0.15	4.12	59.28	96.04	3.96
1990	18,591	250,754	9,475.7	229.9	9,705.6	50.97	1.24	3.78	0.09	2.43	52.21	97.63	2.37
1991	6,385	259,409	9,946.8	102.0	10,048.8	155.77	1.60	3.83	0.04	1.03	157.37	98.98	1.02
1992	6,410	187,553	6,027.9	568.5	6,596.4	94.04	8.87	3.21	0.30	9.43	102.90	91.38	8.62
1993	7,936	253,723	6,421.3	845.5	7,266.8	80.91	10.65	2.53	0.33	13.17	91.57	88.36	11.64
1994	16,555	271,503	7,715.6	1,009.0	8,724.5	46.61	6.09	2.84	0.37	13.08	52.70	88.44	11.56
1995	20,186	310,033	7,842.6	840.2	8,682.8	38.85	4.16	2.53	0.27	10.71	43.01	90.32	9.68
1996	22,544	410,213	8,528.7	2,960.2	11,488.9	37.83	13.13	2.08	0.72	34.71	50.96	74.23	25.77
1997	31,085	575,671	10,238.0	3,127.8	13,365.8	32.93	10.06	1.78	0.54	30.55	43.00	76.60	23.40
1998	32,024	601,841	11,784.8	2,637.3	14,422.1	36.80	8.24	1.96	0.44	22.38	45.04	81.71	18.29
1999	34,860	685,712	12,269.3	4,235.1	16,504.4	35.20	12.15	1.79	0.62	34.52	47.34	74.34	25.66
2000	51,674	841,011	14,384.2	6,549.6	20,933.9	27.84	12.67	1.71	0.78	45.53	40.51	68.71	31.29
2001	38,403	777,965	16,456.1	5,412.1	21,868.2	42.85	14.09	2.12	0.70	32.89	56.94	75.25	24.75

Table 16 Panel B: Aggregate cash distribution to equityholders based on high earnings volatility

	$\Sigma_1 \text{EARN}$	$\Sigma_1 \text{MV}$	$\Sigma_1 \text{DIV}$	$\Sigma_1 \text{REPO}$	$\Sigma_1 \text{TPAY}$	Dividend Payout Ratio	Repurchase Payout Ratio	$\Sigma \text{DIV} / \Sigma_1 \text{MV}$	$\Sigma \text{REPO} / \Sigma_1 \text{MV}$	$\Sigma \text{REPO} / \Sigma_1 \text{DIV}$	Total Payout Ratio	DIV / TPAY	$\text{Repo} / \text{TPAY}$
1987	1,760	33,919	591	350	941	33.59	19.87	1.74	1.03	59.17	53.46	62.82	37.18
1988	3,201	34,358	2,098	473	2,570	65.54	14.76	6.11	1.38	22.53	80.31	81.61	18.39
1989	3,074	44,179	1,027	293	1,320	33.41	9.52	2.32	0.66	28.49	42.93	77.82	22.18
1990	(1,570)	42,033	1,096	87	1,183	(69.82)	(5.56)	2.61	0.21	7.96	-75.38	92.63	7.37
1991	(5,090)	45,509	1,203	48	1,252	(23.64)	(0.95)	2.64	0.11	4.00	-24.59	96.15	3.85
1992	(5,506)	63,093	1,040	44	1,084	(18.89)	(0.80)	1.65	0.07	4.25	-19.69	95.92	4.08
1993	(3,553)	92,914	1,111	432	1,543	(31.27)	(12.15)	1.20	0.46	38.85	-43.42	72.02	27.98
1994	4,280	111,338	1,211	166	1,378	28.30	3.89	1.09	0.15	13.74	32.19	87.92	12.08
1995	8,341	132,621	1,389	2,278	3,667	16.65	27.31	1.05	1.72	163.97	43.96	37.88	62.12
1996	1,665	155,523	1,346	3,332	4,678	80.80	200.10	0.87	2.14	247.64	280.90	28.77	71.23
1997	(2,082)	156,411	1,947	3,747	5,694	(93.50)	(179.99)	1.24	2.40	192.50	-273.49	34.19	65.81
1998	(4,782)	187,160	2,391	2,039	4,430	(50.00)	(42.64)	1.28	1.09	85.29	-92.64	53.97	46.03
1999	(825)	446,475	2,520	1,144	3,664	(305.28)	(138.68)	0.56	0.26	45.43	-443.96	68.76	31.24
2000	(6,279)	531,335	2,607	4,362	6,969	(41.53)	(69.47)	0.49	0.82	167.28	-111.00	37.41	62.59
2001	(140,429)	237,836	2,568	3,975	6,543	(1.83)	(2.83)	1.08	1.67	154.83	-4.66	39.24	60.76

Fig. 6 Dividends and Share Repurchase of Low Earnings Volatility Firms

Fig 7. Dividends and Share Repurchases of High Earnings Volatility Firms

4.3 Logit regression confirmation of dividend payers and share repurchasers

Having examined the fundamental factors that affect the decisions to pay dividends and to engage in share repurchase activity, as well as an in-depth analysis of earnings volatility and its impact on different payout options, it is important to document more formally the marginal effect of the impact of these fundamental factors on the likelihood that a firm pays dividends or repurchase shares. The logit regression enables us to make inferences about the roles of the fundamental factors in the payout decisions. The variables used in the regression are one year prior to the dividend year to ensure consistency with the Likelihood regression process.

Table 17 panels A and B document the annual logit regressions for each year t of the period 1987 to 2001 and explain the marginal effect of size, investment opportunities, and profitability on the likelihood that a firm pays dividends or repurchase shares, respectively⁶¹. The proxy measure for size is the natural log of the market capitalization of the firm (“LNMW”). Market capitalization is the product of total outstanding shares of the firm at year end and market closing price of shares at year end. The proxy for investment opportunities is price-to-book (“PRBV”), and is measured by the ratio of the closing stock market price at the last day of the year to book value per share. The proxy for profitability is the return on assets (“ROYE”), and is measured as the ratio of net income to total assets at year end. The dependent variable (binary variable) is 1.0 in year t if a firm pays dividend or repurchase shares and 0.0 if the firm does not pay dividends or does not repurchase shares. Tables 17 panels A and B also display across-year binary

⁶¹ The choice of variables was purposely made to replicate Fama and French (2001).

logistic regression intercept, the t-statistics for the average coefficients, and the significance of the coefficients for 1987 to 2001. The table also shows across-firm average regression coefficients, t-statistics, and the significance for each of the years from 1988 to 2001.

In table 17 Panel A, the combined period (1987-2001) coefficients confirm the observation about the impact of size, investment opportunities, and profitability in the decision to pay dividends. From Table 17 Panel A, larger firms are more likely to pay dividends based on the fact that the average coefficient of the size measure, LNMW, is 0.57617, with a positive and significant t-statistic of 43.19. Moreover, more profitable firms are likely to pay dividends, with average coefficient of ROYE of 0.0246 and a t-statistic of 14.15. However, firms with greater investment opportunities are less likely to pay dividends based on the observation that the average coefficient of PRBV is -0.00263 with a t-statistic of -6.72.

For each of the years from 1988 to 2001, the marginal effect of size on dividend payment decision is positive. Moreover, the marginal effect of profitability on dividend payment is equally positive throughout the period from 1988 to 2001, while the marginal effect of investment opportunities on dividend decisions is negative for all the years from 1988 to 2001. It is, however, equally important to note that the negative effect of investment opportunities on decisions is somewhat weaker in six out of the fifteen years while the positive effect of profitability on dividend decision is only weaker in one out of fifteen years.

From table 17 Panel B, size (LNMW) positively influences the decision to repurchase shares with t-statistic of 9.16 and average coefficient of 0.13519. However, compared to the size-based coefficients of Panel A, the coefficients of size (LNMW) of firms that engage in share repurchase are smaller in magnitude although positive and significant. The implication is that the repurchase probability is less sensitive to size, whereas the dividend payout probability is more sensitive to size. The indirect conclusion from Table 17 Panel B is that smaller firms are more likely to repurchase shares than pay dividends as a payout option. However, the likelihood that profitable firms, measured by ROYE, will repurchase shares is insignificant with t-statistic of 0.60 and an average coefficient of 0.0004. It is important to note that six of the fifteen years had negative t-statistic for profitability, with t-statistic of -2.58 for 1988 and -1.62 for 1997 being significant.

Table 17 Panel A: Logit regressions to explain which firms pay dividends

Year	Average Coefficient				t-statistic				Significance			
	LNMW	PRBV	ROYE	Constant (Intercept)	LNMW	PRBV	ROYE	Constant (Intercept)	LNMW	PRBV	ROYE	Constant (Intercept)
1987-2001	0.57617	-0.00263	0.02460	-7.35705	43.19	-6.72	14.45	-46.52	0.0000	0.0000	0.0000	0.0000
1988	0.99337	-0.01946	0.07869	-10.48366	8.19	-0.29	3.69	-8.18	0.0000	0.7694	0.0002	0.0000
1989	0.79738	-0.00178	0.03797	-8.47741	8.78	-1.16	2.80	-8.66	0.0000	0.2462	0.0051	0.0000
1990	0.77277	-0.25135	0.03749	-7.88091	10.11	-3.25	3.48	-9.76	0.0000	0.0011	0.0005	0.0000
1991	0.73096	-0.00107	0.00153	-8.09203	11.53	-1.37	0.86	-11.61	0.0000	0.1703	0.3900	0.0000
1992	0.70853	-0.00142	0.01072	-8.31599	11.51	-1.26	1.69	-11.86	0.0000	0.2075	0.0914	0.0000
1993	0.70089	-0.00228	0.04245	-8.88620	11.79	-1.89	4.40	-12.52	0.0000	0.0584	0.0000	0.0000
1994	0.66431	-0.00139	0.03030	-8.51410	12.04	-1.51	3.65	-13.04	0.0000	0.1314	0.0003	0.0000
1995	0.59585	-0.00226	0.02995	-7.74027	11.46	-1.81	3.82	-12.52	0.0000	0.0698	0.0001	0.0000
1996	0.72650	-0.56068	0.07842	-8.44781	12.90	-7.32	6.28	-13.13	0.0000	0.0000	0.0000	0.0000
1997	0.66335	-0.00192	0.04890	-8.95222	13.08	-1.60	5.84	-14.33	0.0000	0.1104	0.0000	0.0000
1998	0.66190	-0.00351	0.02675	-8.78039	13.60	-2.25	4.68	-14.77	0.0000	0.0246	0.0000	0.0000
1999	0.74569	-0.42867	0.04033	-9.09341	14.00	-6.89	4.66	-14.86	0.0000	0.0000	0.0000	0.0000
2000	0.49883	-0.00288	0.01046	-6.97807	12.62	-1.95	3.35	-14.31	0.0000	0.0517	0.0008	0.0000
2001	0.64888	-0.00159	0.04342	-8.77750	13.38	-1.37	6.45	-14.56	0.0000	0.1692	0.0000	0.0000

Table 17 Panel B: Logit regressions to explain which firms repurchase shares

Year	Average Coefficient				t-statistic				Significance			
	LNMW	PRBV	ROYE	Constant (Intercept)	LNMW	PRBV	ROYE	Constant (Intercept)	LNMW	PRBV	ROYE	Constant (Intercept)
1987-2001	0.13519	0.00050	0.00040	-3.80876	9.16	3.35	0.60	-21.70	0.0000	0.0008	0.5458	0.0000
1987	0.11048	0.00150	0.01591	-4.30040	0.80	1.22	0.63	-2.62	0.4223	0.2241	0.5275	0.0087
1988	-0.01175	-0.00764	-0.03296	-2.54046	-0.10	-1.18	-2.58	-1.95	0.9196	0.2378	0.0099	0.0507
1989	0.04426	0.00164	0.00617	-3.75805	0.36	1.82	0.75	-2.69	0.7155	0.0687	0.4525	0.0071
1990	0.04339	-0.00028	0.00239	-3.25332	0.49	-0.25	0.37	-3.28	0.6237	0.8012	0.7115	0.0010
1991	0.16425	0.00096	-0.00009	-5.27034	1.58	1.11	-0.02	-4.31	0.1139	0.2665	0.9819	0.0000
1992	0.04004	-0.00366	0.00526	-3.57295	0.43	-0.70	0.49	-3.36	0.6708	0.4819	0.6217	0.0008
1993	0.15179	0.00067	-0.00339	-4.92604	1.61	0.85	-0.63	-4.39	0.1079	0.3934	0.5319	0.0000
1994	0.27020	0.00110	-0.00120	-6.08655	3.43	1.53	-0.64	-6.34	0.0006	0.1249	0.5254	0.0000
1995	0.22897	0.00067	0.00010	-5.38178	3.15	0.83	0.01	-6.11	0.0016	0.4049	0.9893	0.0000
1996	0.16349	0.00095	-0.00035	-4.43639	2.70	1.65	-0.12	-6.06	0.0070	0.0994	0.9057	0.0000
1997	0.14237	0.00032	-0.00334	-3.87715	2.80	0.57	-1.62	-6.34	0.0052	0.5694	0.1046	0.0000
1998	0.06687	0.00060	0.00260	-2.70491	1.56	1.53	1.01	-5.39	0.1187	0.1260	0.3124	0.0000
1999	0.09316	0.00060	0.00383	-2.64962	2.58	1.63	1.64	-6.20	0.0098	0.1036	0.1001	0.0000
2000	0.14152	0.00033	0.00123	-3.09657	4.14	0.93	1.03	-7.55	0.0000	0.3504	0.3040	0.0000
2001	0.10632	0.00012	0.00369	-3.05817	2.66	0.27	1.56	-6.38	0.0079	0.7849	0.1196	0.0000

Hence, although the overall effect of profitability on share repurchases is insignificant, for specific periods, there is the likelihood that less profitable firms will utilize share repurchases than pay dividends as a payout option. Panel B of table 17 further confirms that firms with greater investment opportunities are more likely to engage in share repurchase activities with average coefficient of 0.0050 based on a t-statistic of 3.35 for PRBV. The marginal effect of investment opportunities on share repurchase decisions is therefore positive and significant. It is further noted that the volatility and some insignificance of the profitability and investment opportunity coefficients on dividend and repurchase decisions for individual years, is simply a reflection of the volatility of the financial health of the firms. In the case of size, this problem does not arise because the size of firms does not vary very much from year to year.

In addition to determining the marginal effect of firm characteristics on the likelihood that a firm pays dividends or repurchase shares as highlighted in the preceding discussion, it is equally important to examine the joint impact of these factors on likelihood that a firm use dividends only, or use dividends and share repurchase only, or use share repurchases only or use neither dividends nor share repurchases, as a payout option. The motivation of the ensuing analysis is that decisions on the payout method used by the firm are not made in isolation of other competing methods of payout. While some firms may choose to pay dividends only, others may use only share repurchases while there are some who may also use a combination of the two, and yet still, there are others who may use neither share repurchases nor dividends. Hence, a multinomial approach that incorporates the various forms of payout options is a closer representation

to what happens in the firm's payout decision process than the binomial decision process of paying or not paying dividends.

Table 17 Panel C below is the output report of a multinomial SAS GENMOD program based on a cumulative logit link function using size, market-to-book ratio and return on assets as the predictor variables and a four-level response variables using the classification in Table 6 Panel B⁶². In addition to the fact that the combined model (1987-2001) and each of the individual-year models, respectively, converged, the combined model also displays a strong goodness-of-fit based on the log likelihood ratio test⁶³. It is further observed that size has a positive influence of 0.3383 on the likelihood of firms using the different payout options with a *p-value* of <0.0001. In addition, although the

⁶² The SAS GENMOD codes for running the multinomial logit without and with full interaction is as shown:

```
proc import datafile = 'c:\documents and settings\samuel\my documents\combiney.xls'
out=work.xyz;
getnames=yes;
run;
proc contents data=work.xyz;
run;
data work.xyz;
set work.xyz;
if divonly eq 1 then response=1;
else if divrepo eq 1 then response=2;
else if repoonly eq 1 then response=3;
else if neither eq 1 then response=4;
proc genmod data=work.xyz;
class response;
model response=lnmw prbv roye / dist=mult link=cumlogit;
run;
proc genmod data=work.xyz;
class response;
model response=lnmw prbv roye lnmw*prbv lnmw*roye prbv*roye lnmw*prbv*roye / dist=mult;
run;
```

⁶³ From the normal model displayed in Table 17 Panel C with no interaction and 6 parameters, the log likelihood value is -7041.5093, while from the saturated model (not reported here), with full interaction between the predictor variables and 10 parameters, the log-likelihood value is -7102.1522. The $-2(L_{normal} - L_{saturated})$ Chi-Squared transformation results into a Chi-Squared estimate of 121.2858 with 4 degrees of freedom, and suggests a strong goodness-of-fit at approximately <0.0001.

magnitude of influence of investment opportunity on payout decisions is small and negative at -0.0006, it is nevertheless significant at a *p-value* of 0.0002. Lastly, the impact of return on assets on payout decisions is positive at 0.0174 and significant with a *p-value* of <0.0001. It is further noted that across most of the fifteen sample years, size and return on assets display significant marginal effect on the decision of the firms to use either of the payout options discussed above, although market-to-book ratio only demonstrates significance in three out of the fifteen years.

Table 17 Panel C: Multinomial logit result of selected firm characteristics on payout decision

Year	Response Variables						Predictor Variables					
	Intercept 1	p-value	Intercept 2	p-value	Intercept 3	p-value	lnmw	p-value	prbv	p-value	roye	p-value
1987-2001	-3.9601	<.0001	-3.7092	<.0001	-3.1104	<.0001	0.3383	<.0001	-0.0006	0.0002	0.0174	<.0001
1987	-2.5601	0.1021	-2.0549	0.1882	-1.5752	0.3124	0.3186	0.0189	-0.0013	0.3748	0.117	0.0012
1988	-3.1722	0.0326	-2.7505	0.0631	-1.5119	0.311	0.4337	0.0012	-0.0053	0.1518	0.0342	0.0302
1989	-2.4376	0.0521	-2.0979	0.0934	-1.6162	0.1951	0.3606	0.0014	-0.0019	0.0412	0.0558	0.0066
1990	-2.1991	0.0356	-1.7501	0.0930	-1.0190	0.3285	0.3335	0.0004	-0.0031	0.0071	0.0271	0.0052
1991	-3.9278	0.0003	-3.7623	0.0005	-3.3030	0.0022	0.4930	<.0001	-0.0010	0.1643	0.0045	0.5468
1992	-3.9763	<.0001	-3.8082	<.0001	-3.2186	<.0009	0.4675	<.0001	-0.0025	0.0375	0.0085	0.3349
1993	-4.205	<.0001	-4.0465	<.0001	-3.5696	<.0001	0.4289	<.0001	-0.0007	0.4397	0.0347	0.0135
1994	-4.8895	<.0001	-4.683	<.0001	-4.2498	<.0001	0.4613	<.0001	-0.0003	0.7415	0.0038	0.4537
1995	-4.3359	<.0001	-4.1213	<.0001	-3.6928	<.0001	0.3864	<.0001	-0.0011	0.2107	0.0215	0.004
1996	-5.2892	<.0001	-5.0213	<.0001	-4.5507	<.0001	0.4384	<.0001	-0.0006	0.4085	0.0175	0.0085
1997	-5.7937	<.0001	-5.4719	<.0001	-4.837	<.0001	0.4552	<.0001	-0.0003	0.5997	0.0046	0.1493
1998	-6.0785	<.0001	-5.7575	<.0001	-5.0055	<.0001	0.4609	<.0001	0.0000	0.9636	0.0091	0.0048
1999	-5.2648	<.0001	-4.8833	<.0001	-3.9996	<.0001	0.3612	<.0001	-0.0001	0.8493	0.0131	0.0002
2000	-4.8098	<.0001	-4.3929	<.0001	-3.4284	<.0001	0.3172	<.0001	0.0000	0.9828	0.0191	<.0001
2001	-5.6294	<.0001	-5.302	<.0001	-4.4695	<.0001	0.4084	<.0001	-0.0002	0.7452	0.0159	<.0001

Multinomial logit results of the effects of size, profitability and investment opportunity on the decision to use dividends only, dividends and share repurchases together, share repurchases only and neither of the payout methods. Size (lnmw) is measured by the natural log of market capitalization. Investment opportunity (prbv) is measured by the ratio of market price to book price. Profitability (roye) is measured by the Return on Assets which is net operating profit dividend by total assets. Intercept 1 represents decision to use dividends only (divonly). Intercept2 represents decision to use dividends and share repurchases only (divrepo). Intercept3 represents decision to use share repurchases only (repoonly). SAS PROC GENMOD is used to model the probabilities of levels of response having lower ordered values in the response profile table based on a cumulative logit link function using multinomial distribution. There is also convergence in the model for both the combined years and the individual years. The p-values indicate the degree of significance of the estimate.

In summary, the binomial logit regressions provide an indirect confirmation that larger firms are more likely to pay dividends while smaller firms are more likely to repurchase shares. Moreover, more profitable firms are likely to pay dividends while less profitable firms may find share repurchase a more preferable payout option. Finally, firms with greater investment opportunities are less likely to pay dividends but more likely to repurchase shares as a payout option. Firms with greater investment opportunity tend to be under-investing in nature, and therefore they require funds to take advantage of the available investment opportunity. One approach to conserve cash resources is to pay lower proportion of dividends, and another approach is to adopt share repurchases. Although share repurchases amounts to a cash outflow, it is nevertheless not a relatively permanent commitment to shareholders and is implemented only if and when it is financially convenient to do so.

The multinomial logit results also confirm that the above mentioned predictors have significant joint impact on the likelihood that a firm will use either dividends only, dividends and share repurchases, share repurchases only, or neither of the payout methods discussed, as its payout policy. The results from Canadian dividend payment activities are consistent with the findings from the U.S. market. Fama and French (2001) concluded that larger firms are more likely to pay dividends with beta of 5.03 and t-statistic of 37.84. Consistent with the Canadian findings, Fama and French (2001) also observed a negative beta of -0.83 and a t-statistic of -16.93 with respect to the effect of investment opportunities on dividend payments and a positive beta of 10.47 with a t-statistic of 12.20 of the effect of profitability on dividend payment. The observations

from Canadian share repurchase activities are consistent with the observation of the U.S. market. Jagannathan, Stephens, and Weisbach (2000) found that firms that pay dividends have more stable earnings than do firms that use share repurchases. Grullon and Michaely (2002) also observed that firms that repurchase shares tend to be small in size, with high market-to-book ratios (high investment opportunities) with high earnings volatility. Sections 4.1 to 4.3 above provided a detailed description of the data as well as a detailed discussion of the time trends in dividends and share repurchases. The subsequent sections provide a discussion of various specific research questions of this study.

4.4 Dividend payment pattern of firms with dual-class share structure

From the extant literature, no study has examined the differences between the dividend payment pattern of firms with dual-class structure and those with single-class structure. However, the conclusion drawn from the literature on agency theory is that firms with dual-class share structure will tend to pay more dividends than firms with single-class share structure. To examine the differences between dual-class and single-class share structure and to test the significance of the differences, the sample of firms is simply divided into single-class structure and dual-class structure. Subsequently several analyses are conducted including the proportion of payers of dividends, dividend yield, dividend payout ratios, as well as aggregate cash distributions based on dividend payments and share repurchase expenditures. To ensure consistency of results, a matched sample of single-class firms is separately created based on propensity score technique developed in Rosenbaum and Rubin (1983) and applied in Thomas (1986) for replication of analysis. The independent variables used in the propensity score calculation are market capitalization, total assets, total revenue, market-to-book ratio, debt-to-asset ratio, and industry classification.

4.4.1 Proportion of dividend payers for dual-class and single-class firms

Table 18 panel A below displays a comparison of the proportion of firms with dual-class and single-class share structure, the respective sample sizes of firms actually paying dividends, and the percentage of firms that pay dividends. Figure 8 also displays a pictorial representation of the proportion of firms that pay dividends from 1987 to 2001.

The major observation is that both share classes experience a decline in the proportion of firms that pay dividends over the sample period. With respect to dual-class shares, the proportion of firms that pay dividends declined from 67.09% in 1987 to 50% in 2001. Similarly, the proportion of single-class firms paying dividends declined from 49.80% in 1987 to 18.01% in 2001. What distinguishes the dual-class from the single-class shares is that the disappearance of dividend payments is more pronounced in the single-class shares than the dual-class shares. The proportionate decline of dual-class firms over the fifteen year period from 1987 to 2001 was 17.09% while the single-class firms experienced a 31.79% decline over the same period. This observation confirms the conclusion from agency theory that dual-class firms will tend to pay more dividends than single-class firms. Hence, even as dividends have been disappearing, the rate of disappearance is more pronounced with single-class firms than with dual-class firms.

Table 18 Dividend payers, dividend yield and dividend payout of dual and single-class shareholders

Year	Panel A Proportion of Payers				Panel B Dividend Yields		Panel C Dividend Payout	
	Duals %	Sample Duals	Singles %	Sample Singles	Duals %	Singles %	Duals %	Singles %
1987	67.09	53	49.80	122	1.95	1.83	31.69	37.93
1988	69.77	60	49.48	144	2.37	2.30	38.94	52.14
1989	67.03	61	47.44	167	2.05	2.14	59.99	70.26
1990	64.29	72	41.96	188	2.91	1.81	91.81	81.83
1991	56.25	72	35.80	208	2.78	1.94	119.32	105.93
1992	49.65	71	30.01	205	1.93	1.49	60.45	89.87
1993	48.32	72	26.60	200	1.58	0.69	75.12	62.63
1994	45.73	75	25.55	209	1.65	0.88	65.27	59.67
1995	45.61	78	23.91	224	1.36	0.86	58.05	47.65
1996	50.52	98	21.31	222	1.73	0.99	82.18	55.94
1997	51.52	102	19.04	206	2.02	0.59	94.17	48.77
1998	48.06	99	18.45	207	2.67	0.68	67.66	74.34
1999	48.50	97	17.26	195	3.16	0.66	88.81	55.12
2000	50.80	95	18.28	193	3.67	1.57	65.36	49.64
2001	50.00	89	18.01	170	3.33	1.21	75.95	59.05

Fig 8. Proportion of Payers of Dividends

4.4.2 Dividend yield and dividend payments for dual-class and single-class firms

Panel B of table 18 and fig. 9 shows a comparison of mean dividend yield for dual-class firms and single-class firms from 1987 to 2001. Panel C of table 18 and figure 10 also show a comparison of dividend payout ratios of dual-and single-class share firms from 1987 to 2001. The key observation with respect to dividend yield is that dual-class firms tend to have a higher mean dividend yield than single-class firms over the period from 1987 to 2001. In 1987 the mean dividend yield for dual-class firms was 1.95% while in the case of single-class firms it was 1.83%. By 2001, mean dividend yield for dual-class firms was 3.33% while single-class firm mean dividend yield was 1.21%. Both share classes are affected by market cycles but the dividend yield of dual-class firms is higher than single-class firms. The mean dividend yield for dual-class firms of 2.34% for the period 1987 to 2001 is higher and statistically significant than the mean dividend yield of 1.31% for single-class firms over the same period⁶⁴.

In terms of dividend payout ratio, Panel C of table 18 and figure 10 show that, in ten out of fifteen years, the mean dividend payout ratio of dual-class firms was higher than single-class firms. Starting from 1991 both dual-class and single-class firms experienced a decline in mean dividend payout ratio, however, the decline has been more pronounced in the single-class firms than in the dual-class firms. As at 2001, the mean dividend payout for dual-class firms was 75.95% while the mean dividend payout for single-class firms was 59.05%. The mean dividend payout ratio for dual-class firms of 71.65% for the

⁶⁴ Based on Wilcoxon Signed Rank Test with z-score of -3.294.

period 1987 to 2001 is higher and statistically significant than the mean dividend payout ratio of 63.38% for single-class firms over the same period⁶⁵.

⁶⁵ Based on Wilcoxon Signed rank Test with z-score of -1.647.

Fig 10. Dividend Payout Ratio

4.4.3 Trends in corporate payout for dual-class and single-class firms

Table 19 shows the actual expenditure of dividends and share repurchases from 1987 to 2001 and Panels A and B represent firms with only positive earnings in the relevant year. Total repurchases to total payout represented by cash dividends and share repurchases increased from 6.06% in 1987 to 44.20% in 2001 for dual-class firms while the same ratio for single-class firms also increased from 3.58% in 1987 to 14.02% in 2001. While it is evident that share repurchases have replaced dividend payments as a payout option, the impact is more pronounced with dual-class firms than single-class firms. During periods of positive earnings, dual-class firms use more of share repurchases and less of dividends as a payout option while single-class firms use less of repurchases and more of dividends as a payout option.

Table 19 Panels C and D represent firms with only negative earnings within the relevant year. Total repurchases to total payout for dual-class firms generally declined from 67.34% in 1990 to 35.06% in 2001, while the same ratio for single-class firms increased from 0.98% in 1987 to 76.59% in 2001. During the periods of negative earnings, dual class firms use less of share repurchases and more of dividend payments as a payout option, while firms with single-class shares use more of share repurchases and less of dividends as a payout option.

In summary, dual-class firms exhibit a different dividend pattern than single-class firms over the period from 1987 to 2001. The disappearance of dividends is more prominent in the single-class firms than in the dual-class firms, confirming the conclusions from

agency theory, as discussed in section 3.1 above, that dual firms will tend to pay more dividends than single-class firms. Dual-class firms tend to have higher dividend yields and dividend payout ratios than single-class firms.

Table 19 Panel A: Aggregate cash distribution to dual-class equityholders (positive earnings only)

Year	$\Sigma_i \text{EARN}$	$\Sigma_i \text{MV}$	$\Sigma_i \text{DIV}$	$\Sigma_i \text{REPO}$	$\Sigma_i \text{TPAY}$	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{EARN}}$ N %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{EARN}}$ %	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{MV}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{MV}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{DIV}}$ %	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{TPAY}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{TPAY}}$ %
1987	957	13,173	260	17	276	27.11	1.75	1.97	0.13	6.46	93.94	6.06
1988	1,367	15,346	333	16	349	24.38	1.18	2.17	0.10	4.83	95.40	4.60
1989	2,068	18,730	351	269	620	16.97	13.00	1.87	1.44	76.59	56.63	43.37
1990	1,273	15,543	468	103	571	36.79	8.08	3.01	0.66	21.96	82.00	18.00
1991	934	16,132	328	10	337	35.06	1.06	2.03	0.06	3.01	97.08	2.92
1992	1,424	23,877	395	30	425	27.73	2.11	1.65	0.13	7.59	92.94	7.06
1993	1,712	29,588	558	158	716	32.59	9.20	1.89	0.53	28.25	77.97	22.03
1994	2,745	36,623	749	265	1,014	27.28	9.64	2.05	0.72	35.33	73.89	26.11
1995	3,332	39,089	855	329	1,184	25.67	9.87	2.19	0.84	38.44	72.23	27.77
1996	3,856	57,693	1,148	341	1,488	29.76	8.83	1.99	0.59	29.68	77.11	22.89
1997	5,759	75,892	2,023	1,482	3,505	35.13	25.73	2.67	1.95	73.25	57.72	42.28
1998	6,037	79,259	1,831	809	2,640	30.33	13.41	2.31	1.02	44.21	69.34	30.66
1999	7,830	100,433	2,170	2,087	4,257	27.71	26.66	2.16	2.08	96.20	50.97	49.03
2000	9,341	104,026	3,173	1,517	4,690	33.97	16.24	3.05	1.46	47.81	67.65	32.35
2001	7,145	114,727	3,513	2,783	6,296	49.17	38.95	3.06	2.43	79.23	55.80	44.20

Table 19 Panel B: Aggregate cash distribution to single-class equityholders (positive earnings only)

Year	$\Sigma_i \text{EARN}$	$\Sigma_i \text{MV}$	$\Sigma_i \text{DIV}$	$\Sigma_i \text{REPO}$	$\Sigma_i \text{TPAY}$	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{EARN}}$ N %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{EARN}}$ %	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{MV}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{MV}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{DIV}}$ %	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{TPAY}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{TPAY}}$ %
1987	15,925	202,143	6,716	249	6,965	42.17	1.57	3.32	0.12	3.71	96.42	3.58
1988	22,076	250,864	9,425	123	9,548	42.69	0.56	3.76	0.05	1.30	98.72	1.28
1989	17,863	259,013	9,162	181	9,344	51.29	1.01	3.54	0.07	1.98	98.06	1.94
1990	20,368	259,753	9,550	95	9,645	46.89	0.47	3.68	0.04	1.00	99.01	0.99
1991	12,758	196,362	7,072	10	7,082	55.43	0.08	3.60	0.01	0.14	99.86	0.14
1992	10,900	200,951	5,733	279	6,011	52.59	2.56	2.85	0.14	4.86	95.36	4.64
1993	10,703	235,460	5,056	364	5,420	47.24	3.40	2.15	0.15	7.21	93.28	6.72
1994	21,062	316,188	8,037	299	8,336	38.16	1.42	2.54	0.09	3.73	96.41	3.59
1995	29,925	364,922	8,257	1,878	10,136	27.59	6.28	2.26	0.51	22.75	81.47	18.53
1996	28,979	482,832	9,195	3,075	12,270	31.73	10.61	1.90	0.64	33.45	74.94	25.06
1997	34,035	578,891	9,008	2,192	11,200	26.47	6.44	1.56	0.38	24.33	80.43	19.57
1998	39,411	569,141	11,190	1,597	12,787	28.39	4.05	1.97	0.28	14.27	87.51	12.49
1999	40,825	698,821	11,155	2,253	13,408	27.32	5.52	1.60	0.32	20.20	83.19	16.81
2000	58,530	837,651	13,038	6,542	19,580	22.28	11.18	1.56	0.78	50.17	66.59	33.41
2001	42,196	688,335	14,445	2,355	16,800	34.23	5.58	2.10	0.34	16.30	85.98	14.02

Table 19 Panel C: Aggregate cash distribution to dual-class equityholders (negative earnings only)

Year	Σ_i EARN	Σ_i MV	Σ_i DIV	Σ_i REPO	Σ_i TPAY	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{MV}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{MV}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{DIV}}$ %	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{TPAY}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{TPAY}}$ %
1987	(82)	1,241	13	-	13	1.01	0.00	0.00	100.00	-
1988	(55)	713	19	-	19	2.73	0.00	0.00	100.00	-
1989	(423)	1,140	41	84	125	3.59	7.41	206.14	32.66	67.34
1990	(832)	2,881	67	1	67	2.32	0.02	0.75	99.26	0.74
1991	(1,191)	10,924	180	110	290	1.65	1.01	61.26	62.01	37.99
1992	(1,710)	8,590	184	24	208	2.14	0.28	13.05	88.46	11.54
1993	(674)	11,100	86	226	312	0.78	2.04	263.07	27.54	72.46
1994	(525)	9,999	27	39	65	0.27	0.39	145.59	40.72	59.28
1995	(570)	7,766	3	181	184	0.04	2.33	5181.22	1.89	98.11
1996	(1,312)	8,954	68	90	158	0.75	1.01	133.49	42.83	57.17
1997	(2,077)	9,965	34	2	36	0.34	0.02	6.42	93.96	6.04
1998	(2,331)	14,192	315	189	504	2.22	1.33	59.89	62.54	37.46
1999	(2,264)	22,818	228	44	272	1.00	0.19	19.50	83.68	16.32
2000	(1,726)	15,128	79	38	117	0.52	0.25	48.43	67.37	32.63
2001	(4,424)	31,054	176	95	271	0.57	0.31	53.98	64.94	35.06

Table 19 Panel D: Aggregate cash distribution to single-class equityholders (negative earnings only)

Year	Σ_i EARN	Σ_i MV	Σ_i DIV	Σ_i REPO	Σ_i TPAY	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{MV}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{MV}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{DIV}}$ %	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{TPAY}}$ %	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{TPAY}}$ %
1987	(971)	7,780	424	4	429	5.46	0.05	0.99	99.02	0.98
1988	(937)	5,951	174	60	234	2.93	1.00	34.15	74.55	25.45
1989	(914)	8,648	309	26	336	3.58	0.31	8.54	92.13	7.87
1990	(3,788)	14,581	487	119	606	3.34	0.81	24.38	80.40	19.60
1991	(10,303)	103,151	4,242	21	4,263	4.11	0.02	0.48	99.52	0.48
1992	(8,593)	62,094	1,832	11	1,843	2.95	0.02	0.58	99.43	0.57
1993	(7,358)	70,490	1,832	66	1,898	2.60	0.09	3.58	96.55	3.45
1994	(2,446)	20,031	114	45	160	0.57	0.23	39.39	71.74	28.26
1995	(4,159)	30,876	115	730	845	0.37	2.36	631.97	13.66	86.34
1996	(4,807)	53,881	250	3,373	3,623	0.46	6.26	1349.32	6.90	93.10
1997	(9,808)	82,834	1,210	2,172	3,382	1.46	2.62	179.44	35.79	64.21
1998	(15,875)	126,408	840	1,976	2,816	0.66	1.56	235.32	29.82	70.18
1999	(12,357)	310,093	1,236	988	2,224	0.40	0.32	79.90	55.59	44.41
2000	(20,750)	415,539	701	2,462	3,163	0.17	0.59	350.98	22.17	77.83
2001	(146,987)	181,958	928	3,036	3,964	0.51	1.67	327.22	23.41	76.59

4.4.4 Matched analysis of dual-class and single-class firms

Panel A of table 20 and Figure 11 show a comparison of the proportion of firms with dual-class and single-class share structure based on a matched sample using propensity scores. Matched single-class firms are selected by matching the computed propensity score estimates of the dual-class and single-class firms. Propensity scores matching allows for the selection of unbiased sample of single-class firms on the basis of several dimensions as discussed in section 3.2.1⁶⁶. Consistent with the preceding observations, both dual-class firms and single-class firms experience gradual decline in the proportion of firms paying dividends but the decline is more pronounced in the single-class shares than dual-class shares. With the exception of 1988 and 1990 when the proportion of dividend payers of single-class firms marginally exceeded the dual-class firms, the proportion of single-class payers is consistently lower than dual-class firms.

Table 20: Matched analysis of dual and single-class shareholders

Year	Panel A Proportion of Payers				Panel B Dividend Yields		Panel C Dividend Payout	
	Matched Duals %	Matched Sample Duals	Matched Singles %	Matched Sample Singles	Matched Duals %	Matched Singles %	Matched Duals %	Matched Singles %
1987	58.33	14	50.00	12	1.84	0.96	52.12	15.71
1988	50.00	12	52.38	11	2.23	1.86	75.41	128.88
1989	47.37	9	36.36	8	1.73	1.50	35.93	53.67
1990	46.67	14	50.00	16	2.21	2.66	124.70	46.86
1991	48.48	16	40.00	20	2.57	1.41	159.05	52.08
1992	38.89	14	36.17	17	2.18	1.49	138.99	61.90

⁶⁶ The rationale for matching is to minimize prior systematic differences between dual class and single class firms, thus ensuring that the differences between the treatment and comparison group are relatively uncontaminated. If the differences in the unmatched sample are the same as the differences in the matched sample, it serves to further validate the results and enhances its replication.

1993	26.19	11	22.73	10	0.82	0.43	106.84	66.61
1994	27.03	10	14.89	7	0.74	0.50	31.16	26.04
1995	29.55	13	17.91	12	0.88	0.77	36.86	38.65
1996	26.79	15	27.27	15	1.01	0.71	51.40	38.78
1997	28.17	20	23.94	17	1.01	0.37	67.73	36.20
1998	30.85	29	12.28	7	1.28	1.13	72.56	82.79
1999	30.39	31	16.67	9	1.60	1.07	76.58	78.35
2000	29.79	28	25.64	20	1.40	0.93	42.11	34.76
2001	31.11	28	24.19	15	1.29	1.35	34.27	43.10

Fig 11 Proportion of Payers of Dividends using Matching Sample

Panel B of table 20 and figure 12 also show a comparison of dividend yields of matched dual-and single-class firms. With the exception of 1990 and 2001 when the dividend yield of single-class firms exceeded dual-class firms, mean dividend yield of 1.52% for dual-class firms over the period from 1987 to 2001 is higher and statistically significant⁶⁷ than the mean dividend yield of 1.14% for single-class firms over the same period.

Panel C of table 20 and figure 13 show that in nine out of fifteen years, the mean dividend payout ratio of dual-class firms were higher than single-class firms. Over the fifteen year period the mean dividend payout for the matched dual-class sample was 73.71% compared to 53.63% for matched single-class firms with statistically significant⁶⁸ difference. It is also important to emphasize that the matched sample is much smaller in terms of the number of observations compared to the unmatched sample, and is explained by the effects of the propensity score matching process.

Table 21 Panel A and B shows the actual expenditure of dividends and share repurchases for the matched sample based on positive earnings alone. Consistent with the non-matching sample, actual expenditure on dividends have declined while the use of share repurchases have increased over the study period. Share repurchase as a proportion of total payout was 34.73% for the dual class and 8.42% for the single-class firms which further confirms the observation that dual-class firms have tended to use more share repurchases and less dividends as a payout option. Table 21 Panel C and D shows actual payout expenditures based on negative earnings alone. It is evident that dual class firms

⁶⁷ Based on Wilcoxon Sign Rank Test with Z score of -2.84.

spent 97.39% of the total payout on share repurchases while single-class firms spent only 42.13% of the total payout on share repurchase activity.

The conclusion from the matched dual-class and single-class sample analysis is that the results are not different from the non-matched sample. Moreover, the proportion of dividend payers who are dual-class firms is consistently higher than the single-class firms. Dividend yield and dividend payout of dual-class firms are consistently higher than single-class firms. Finally, over the period of the study dual-class firms have spent consistently higher proportion of their payout funds on share repurchase activity than single-class firms regardless of the degree of earnings variability.

⁶⁸ Based on Wilcoxon Sign Rank Test with Z score of -1.48.

Fig 12 Dividend Yield using Matching Sample

Fig 13 Dividend Payout Ratio using Matching Sample

Table 21 Panel A: Aggregate cash distribution to dual-class equityholders (positive earnings only)

Year	$\sum_i \text{EARN}$	$\sum_i \text{MV}$	$\sum_i \text{DIV}$	$\sum_i \text{REPO}$	$\sum_i \text{TPAY}$	$\frac{\sum_i \text{DIV}}{\sum_i \text{EARN}}$ N %	$\frac{\sum_i \text{REPO}}{\sum_i \text{EARN}}$ %	$\frac{\sum_i \text{DIV}}{\sum_i \text{MV}}$ %	$\frac{\sum_i \text{REPO}}{\sum_i \text{MV}}$ %	$\frac{\sum_i \text{REPO}}{\sum_i \text{DIV}}$ %	$\frac{\sum_i \text{DIV}}{\sum_i \text{TPAY}}$ %	$\frac{\sum_i \text{REPO}}{\sum_i \text{TPAY}}$ %
1987	7,215.1	94,126.9	3,596.5	2.7	3,599.2	49.85	0.04	3.82	0.00	0.07	99.93	0.07
1988	195.6	2,011.0	55.3	-	55.3	28.25	-	2.75	0.00	0.00	100.00	-
1989	205.6	1,686.1	50.6	-	50.6	24.60	-	3.00	0.00	0.00	100.00	-
1990	396.5	3,709.2	163.2	-	163.2	41.15	-	4.40	0.00	0.00	100.00	-
1991	420.4	5,025.1	194.4	-	194.4	46.24	-	3.87	0.00	0.00	100.00	-
1992	336.6	4,554.0	109.4	97.9	207.3	32.51	29.09	2.40	2.15	89.48	52.78	47.22
1993	359.4	6,553.9	110.6	100.7	211.4	30.78	28.03	1.69	1.54	91.05	52.34	47.66
1994	341.2	4,835.5	59.4	0.0	59.4	17.40	0.00	1.23	0.00	0.01	99.99	0.01
1995	641.7	11,222.2	176.8	1,239.5	1,416.3	27.54	193.14	1.58	11.05	701.20	12.48	87.52
1996	1,184.6	24,477.7	203.0	6.2	209.2	17.14	0.52	0.83	0.03	3.05	97.04	2.96
1997	2,530.1	36,120.5	386.2	1,029.7	1,415.9	15.26	40.70	1.07	2.85	266.65	27.27	72.73
1998	3,186.0	44,650.1	565.7	91.6	657.3	17.76	2.88	1.27	0.21	16.20	86.06	13.94
1999	3,065.2	42,793.5	660.8	1,524.2	2,185.0	21.56	49.73	1.54	3.56	230.65	30.24	69.76
2000	3,279.4	50,234.1	909.2	162.2	1,071.3	27.72	4.95	1.81	0.32	17.84	84.86	15.14
2001	3,685.3	50,808.4	816.2	33.4	849.6	22.15	0.90	1.61	0.07	4.09	96.07	3.93

Table 21 Panel B: Aggregate cash distribution to single-class equityholders (positive earnings only)

Year	$\sum_i \text{EARN}$	$\sum_i \text{MV}$	$\sum_i \text{DIV}$	$\sum_i \text{REPO}$	$\sum_i \text{TPAY}$	$\frac{\sum_i \text{DIV}}{\sum_i \text{EARN}}$ N %	$\frac{\sum_i \text{REPO}}{\sum_i \text{EARN}}$ %	$\frac{\sum_i \text{DIV}}{\sum_i \text{MV}}$ %	$\frac{\sum_i \text{REPO}}{\sum_i \text{MV}}$ %	$\frac{\sum_i \text{REPO}}{\sum_i \text{DIV}}$ %	$\frac{\sum_i \text{DIV}}{\sum_i \text{TPAY}}$ %	$\frac{\sum_i \text{REPO}}{\sum_i \text{TPAY}}$ %
1987	509	5,460	1,248	83	1,330	245.11	16.25	22.85	1.51	6.63	93.78	6.22
1988	241	2,630	931	0	932	386.79	0.10	35.40	0.01	0.03	99.97	0.03
1989	726	9,776	4,192	-	4,192	577.11	-	42.88	0.00	0.00	100.00	-
1990	322	4,329	1,348	5	1,353	419.32	1.44	31.15	0.11	0.34	99.66	0.34
1991	1,205	13,102	5,263	-	5,263	436.81	-	40.17	0.00	0.00	100.00	-
1992	428	5,763	2,117	98	2,214	494.33	22.87	36.73	1.70	4.63	95.58	4.42
1993	426	19,842	4,467	101	4,568	1,047.52	23.62	22.51	0.51	2.26	97.79	2.21
1994	671	4,687	687	98	784	102.33	14.58	14.65	2.09	14.25	87.53	12.47
1995	1,022	10,154	1,214	537	1,751	118.79	52.54	11.96	5.29	44.23	69.33	30.67
1996	1,942	27,324	5,903	1	5,904	303.96	0.05	21.61	0.00	0.02	99.98	0.02
1997	2,052	26,644	1,974	352	2,326	96.21	17.14	7.41	1.32	17.82	84.88	15.12
1998	689	10,724	1,297	170	1,467	188.40	24.67	12.10	1.58	13.09	88.42	11.58
1999	3,042	41,407	7,658	92	7,749	251.77	3.01	18.49	0.22	1.20	98.82	1.18
2000	3,415	40,655	7,532	300	7,832	220.53	8.79	18.53	0.74	3.98	96.17	3.83
2001	941	14,531	3,377	2,691	6,068	358.82	285.90	23.24	18.52	79.68	55.66	44.34

Table 21 Panel C: Aggregate cash distribution to dual-class equityholders (negative earnings only)

Year	$\Sigma_i \text{EARN}$	$\Sigma_i \text{MV}$	$\Sigma_i \text{DIV}$	$\Sigma_i \text{REPO}$	$\Sigma_i \text{TPAY}$	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{MV}} \%$	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{MV}} \%$	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{DIV}} \%$	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{TPAY}} \%$	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{TPAY}} \%$
1987	(66.3)	391.5	8.8	-	9	2.25	0.00	0.00	100.00	-
1988	(89.7)	504.0	4.7	1.0	6	0.92	0.19	20.59	82.93	17.07
1989	(54.3)	464.4	0.2	-	0	0.04	0.00	0.00	100.00	-
1990	(447.9)	571.0	4.4	18.1	23	0.77	3.18	412.74	19.50	80.50
1991	(229.0)	1,281.3	20.9	-	21	1.63	0.00	0.00	100.00	-
1992	(290.9)	329.6	7.2	-	7	2.18	0.00	0.00	100.00	-
1993	(71.5)	399.8	-	-	-	0.00	0.00	-	-	-
1994	(34.7)	761.7	-	-	-	0.00	0.00	-	-	-
1995	(31.7)	715.3	-	236.0	236	0.00	32.99	-	-	100.00
1996	(132.6)	1,375.8	-	3,088.7	3,089	0.00	224.51	-	-	100.00
1997	(757.4)	2,286.7	-	1,021.2	1,021	0.00	44.66	-	-	100.00
1998	(1,557.0)	6,460.4	31.9	178.0	210	0.49	2.76	558.40	15.19	84.81
1999	(983.1)	5,834.7	48.8	76.5	125	0.84	1.31	156.86	38.93	61.07
2000	(792.2)	5,689.5	-	7.4	7	0.00	0.13	-	-	100.00
2001	(1,237.9)	5,636.7	2.8	210.7	214	0.05	3.74	7525.79	1.31	98.69

Table 21 Panel D: Aggregate cash distribution to single-class equityholders (negative earnings only)

Year	$\Sigma_i \text{EARN}$	$\Sigma_i \text{MV}$	$\Sigma_i \text{DIV}$	$\Sigma_i \text{REPO}$	$\Sigma_i \text{TPAY}$	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{MV}} \%$	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{MV}} \%$	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{DIV}} \%$	$\frac{\Sigma_i \text{DIV}}{\Sigma_i \text{TPAY}} \%$	$\frac{\Sigma_i \text{REPO}}{\Sigma_i \text{TPAY}} \%$
1987	(41.3)	158.7	-	-	-	0.00	0.00	-	-	-
1988	(30.0)	257.0	3.1	53.4	57	1.22	20.77	1696.41	5.57	94.43
1989	(91.2)	183.6	-	21.1	21	0.00	11.48	-	-	100.00
1990	(410.9)	2,022.0	118.2	4.0	122	5.85	0.20	3.39	96.72	3.28
1991	(516.0)	3,362.3	53.3	-	53	1.59	0.00	0.00	100.00	-
1992	(334.9)	1,143.4	3.5	1.4	5	0.30	0.13	41.78	70.53	29.47
1993	(273.5)	1,216.9	-	-	-	0.00	0.00	-	-	-
1994	(203.4)	1,379.3	14.3	-	14	1.04	0.00	0.00	100.00	-
1995	(455.5)	4,071.7	-	-	-	0.00	0.00	-	-	-
1996	(521.1)	1,761.9	0.4	-	0	0.02	0.00	0.00	100.00	-
1997	(1,085.4)	3,527.7	21.7	0.1	22	0.61	0.00	0.35	99.66	0.34
1998	(266.9)	823.3	-	10.6	11	0.00	1.28	-	-	100.00
1999	(291.3)	7,447.7	48.8	2.8	52	0.65	0.04	5.83	94.49	5.51
2000	(934.7)	5,513.6	28.9	93.7	123	0.52	1.70	324.34	23.57	76.43
2001	(3,723.0)	13,292.0	18.8	39.3	58	0.14	0.30	209.41	32.32	67.68

4.5 Size-based analysis

The objective of this segment of the analysis is to determine the impact of size on dividend payments and share repurchases. Previous sections of this study have highlighted the role of size in the decision of firms to make or not make payouts. However, this section of the study formally explores the different measures of size in the literature and their role in payout decisions and, more importantly, how size affects the amount of cash expenditures made by corporations on dividends and share repurchases. Size is one of the relatively permanent characteristics of the firm and, three measures of size are used for the ensuing analysis. Size has traditionally been measured by the sales, market capitalization, or total assets of the firm. First, each firm-year size measure is converted into a natural log to smooth the data. Subsequently, the mean of the natural log is used as a measure of distinguishing large firms from small firms. Firms with sizes below the mean are classified as small and those above the mean are classified as large.

By observation of Table 22 Panels A and B the trends in dividends, using the three measures of size namely, market capitalization, total sales, and total assets produces consistent results across all periods from 1987 to 2001. In terms of the dollar amount of dividends paid, one of the key observations, regardless of the size measure used, is that larger firms pay higher amounts of dividends than smaller firms. For large firms, using total sales as a size measure, the total amount of dividend paid in 1987 was Cdn \$7,342 million in 1987 and, by 2001, the amount had grown to Cdn \$18,771 million. However, for small firms, the total amount of dividends paid in 1987 was Cdn \$70 million and, by 2001, it was only Cdn \$289 million.

In terms of dividend payout ratio, the observation is, however, reversed. Over the fifteen year period from 1987 to 2001, the mean dividend payout ratio of smaller firms, based on total sales as the size measure, exceeded those of the larger firms in all years except in 1989. On average, the dividend payout ratios of the smaller firms were 25% higher than those of the large firms over the fifteen year period, considering that the average dividend payout was 91% for small firms and 66% for large firms. In terms of dividend yield, large firms have higher average dividend yield than small firms over each of the years from 1987 to 2001. The minimum yield for large firms was 1.16% in 1997 and the maximum mean yield was 3.39% in 1988. For small firms, the minimum yield was 0.03% in 1998 and 1999 and the maximum yield was 1.22% in 1991. Moreover, average yield for large firms over the sample period was 2.13%, while the average yield for small firms was 0.74%. Hence, by observation, the average yield for large firms was 1.39% higher than small firms over the sample period.

It is equally interesting to examine the share repurchase expenditure of large and small firms. Using total assets as the size measure, the total amount spent on share repurchase activities was Cdn \$ 24,688 million for small firms over the period from 1987 to 2001, which barely exceeded the total amount of Cdn \$ 23,140 million spent by large firms on share repurchase activities over the same period. Moreover, in eight out of the fifteen years, the total amount spent by small firms on share repurchase activities exceeded the total amount spent on share repurchases by large firms. On average the cash expenditure on share repurchase activities by small Canadian firms was only 7% higher than large

Canadian firms over the period from 1987 to 2001. The main conclusion from the foregoing analysis is that share repurchase activities of small and large firms are not significantly different. This finding is very important although not surprising given that firms that use proportionately more share repurchases tend to have lower market capitalization as well as high earnings volatility and do experience periodic negative earnings. These firms would typically be small firms with lower financial flexibility.

Table 22 Panel A: Size-base analysis of dividend trends (large firms)

Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Market Value-based (large firms)															
Dividend paid (total) \$ Millions	7,317	9,845	9,615	10,352	11,495	7,920	7,391	8,723	9,013	10,243	11,654	12,603	14,031	16,269	18,877
Dividend paid (Mean) \$ Million	52.26	62.71	47.13	40.75	37.32	22.37	19.30	20.29	20.53	19.93	21.46	23.00	24.70	30.52	36.23
Share Repurchase (total) \$ Millions	173	20	113	140	49	207	475	479	636	2,668	2,383	2,003	3,748	7,072	4,506
Share Repurchase (Mean) \$ Millions	5.95	0.64	2.82	3.19	0.99	3.51	5.40	4.10	4.00	13.21	9.61	6.14	8.90	18.13	13.87
Dividend payout (%) – Mean	41.20	70.72	62.97	77.91	114.19	85.23	76.41	66.91	52.86	65.96	67.92	66.73	66.89	51.87	82.65
Dividend Yield (%) – mean	2.35	3.71	2.58	2.84	2.69	2.00	1.36	1.51	1.25	1.06	1.13	1.42	1.46	1.45	2.12
Total Sales-based (large firms)															
Dividend paid (total) \$ Millions	7,342	9,853	9,755	10,436	11,675	7,974	7,425	8,773	9,047	10,336	12,086	13,971	14,642	16,797	18,771
Dividend paid (Mean) \$ Million	46.18	51.32	42.98	36.49	31.55	18.72	16.32	17.44	16.39	16.64	19.34	21.53	22.46	27.49	34.13
Share Repurchase (total) \$ Millions	173	23	113	115	124	225	513	541	2,138	3,579	3,316	2,416	4,226	7,407	5,105
Share Repurchase (Mean) \$ Millions	5.40	0.64	2.83	2.50	2.48	3.70	5.40	4.13	11.37	15.10	11.97	6.39	9.01	17.18	15.29
Dividend payout (%) - Mean	38.54	53.33	68.45	82.62	105.97	85.57	67.11	62.29	49.92	54.32	66.12	70.07	61.51	53.88	71.90
Dividend Yield (%) – mean	2.77	3.39	3.27	3.19	2.90	2.43	1.29	1.54	1.29	1.27	1.16	1.61	1.74	2.07	2.02
Large Firms Total Assets-based (large firms)															
Dividend paid (total) \$ Millions	7,312	9,803	9,692	10,382	11,571	7,928	7,338	8,635	8,954	10,139	11,634	13,507	14,329	16,577	18,437
Dividend paid (Mean) \$ Million	56.24	63.25	55.07	45.54	39.63	23.67	21.03	23.99	21.42	22.63	25.24	28.20	29.48	36.51	42.48
Share Repurchase (total) \$ Millions	173	22	113	79	39	215	399	516	1,685	2,088	2,167	1,961	3,477	5,834	4,374
Share Repurchase (Mean) \$ Millions	6.39	0.72	3.13	1.93	0.90	4.39	5.40	5.26	11.09	12.51	10.78	6.88	9.74	18.01	16.20
Dividend payout (%) - Mean	37.42	50.85	72.13	82.33	114.69	90.37	71.20	61.96	46.01	53.73	51.75	63.27	53.70	52.99	71.02
Dividend Yield (%) – mean	2.96	3.75	3.65	3.30	3.16	2.71	1.50	1.74	1.49	1.36	1.14	1.32	1.74	2.48	2.03

Table 22 Panel B: Size-base analysis of dividend trends (small firms)

Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Market Value-based (small firms)															
Dividend paid (total) \$ Millions	77	69	144	111	133	136	109	168	136	247	192	331	472	224	93
Dividend paid (Mean) \$ Million	0.514	0.356	0.652	0.394	0.412	0.382	0.250	0.357	0.284	0.437	0.320	0.530	0.740	0.348	0.156
Share Repurchase (total) \$ Millions	98	178	448	177	101	136	323	130	901	3,806	3,000	1,971	1,178	3,469	3,763
Share Repurchase (Mean) \$ Millions	4.25	5.40	14.46	4.66	2.99	3.32	5.30	1.53	7.84	23.35	15.96	7.64	3.58	10.74	15.23
Dividend payout (%) - Mean	52.46	35.94	84.46	87.50	90.70	108.08	59.34	63.22	49.27	59.52	52.91	88.42	70.63	89.11	97.51
Dividend Yield (%) - mean	1.44	1.19	1.71	1.32	1.56	1.17	0.40	0.56	0.67	1.16	0.55	0.63	0.68	2.25	1.06
Total Sales-based (small firms)															
Dividend paid (total) \$ Millions	70	99	108	136	138	157	107	150	185	312	185	192	146	178	289
Dividend paid (Mean) \$ Million	0.439	0.557	0.526	0.516	0.424	0.413	0.250	0.322	0.348	0.532	0.295	0.301	0.228	0.299	0.540
Share Repurchase (total) \$ Millions	97	175	448	202	26	118	301	106	979	3,300	2,530	2,137	1,117	3,127	3,148
Share Repurchase (Mean) \$ Millions	3.87	5.65	13.99	5.46	0.65	2.41	4.56	1.18	6.95	20.37	12.65	7.91	3.41	10.71	14.44
Dividend payout (%) - Mean	64.93	73.62	68.05	96.33	125.04	88.39	89.88	78.45	69.04	116.05	67.09	95.24	105.19	82.01	148.00
Dividend Yield (%) - mean	0.85	1.12	0.90	0.85	1.22	0.60	0.37	0.41	0.52	0.93	0.49	0.30	0.30	1.01	1.18
Total Assets-based (small firms)															
Dividend paid (total) \$ Millions	100	149	172	190	243	202	194	288	278	509	638	656	459	399	623
Dividend paid (Mean) \$ Million	0.534	0.695	0.668	0.591	0.601	0.430	0.362	0.475	0.417	0.671	0.805	0.814	0.570	0.530	0.955
Share Repurchase (total) \$ Millions	97	177	448	238	112	128	414	132	1,433	4,791	3,680	2,592	1,867	4,700	3,880
Share Repurchase (Mean) \$ Millions	3.23	4.77	12.45	5.67	2.33	2.10	4.76	1.08	8.09	20.65	13.33	7.14	4.24	11.78	13.76
Dividend payout (%) - Mean	59.72	71.22	61.42	92.81	99.34	75.27	72.87	73.13	72.66	94.35	102.37	103.76	110.76	74.40	131.19
Dividend Yield (%) - mean	1.04	1.28	1.12	1.19	1.36	0.74	0.43	0.56	0.56	0.96	0.65	0.77	0.61	0.99	1.32

It is equally important to analyze the influence of the size of the firm on the decision to pay or not to pay dividends, as well as the influence of size on the amount of dividends paid by the firm. Firstly, to analyze the effects of size on the decision to pay or not pay dividends, a binary logit regression is run between the dependent variable (dummy variable: pay dividend =1; not pay dividends =0) and, the independent variables for various size measures such as market capitalization, total assets, and total sales. Price-to-sales ratio is introduced into the regression as a control variable for the signaling effect of dividends. Secondly, to analyze the effect of size on the amount of dividend paid, an Ordinary least Square (“OLS”) regression is run between the dependent variable using dividend payout ratio with various size measures as independent variables.

Table 23 panels A to C shows the results of the effects of size on the decision to pay or not pay dividends. The results show that the dividend decision is robustly positively correlated with the size of the firm. In the case of panel A of table 23, the size coefficient of 0.58797 is positive and statistically significant at 0.000. The positive relationship between size and the decision to pay dividend is consistent across the size measures using total assets and total sales in panel B and C of table 23. The implication of the results is that, in the Canadian market, large firms are more likely to pay dividends than small firms.

Table 24 panels A to C also shows the results of the effects of size on the amount of dividends paid by firms in the Canadian market. Panel A and C of table 24 show a negative relationship between the size of the firm and the amount of dividends paid by the firm. Using market capitalization as a size measure, the regression coefficient of size is

-1.70455 at 19.76% significance. When Total Sales is used as a measure of size, the regression coefficient is -4.4921 at 0.01% significance level. Although there is some instability in the regression outcome, the implication of the negative coefficient is that larger firms tend to have smaller dividend payout ratios while smaller firms tend to have larger dividend payout ratios. This observation is consistent with the results in table 17 above.

The conclusion from the above discussion is that the results from the Canadian market on the effect of size on dividends supports key findings of size-based studies in the finance literature. The positive relationship between size and the decision to pay dividends in Canada is consistent with the findings of Redding (1997) from the US market. Reddings (1997) confirmed that large corporations choose to pay dividends while small corporations owned by individuals do not usually pay dividends. However, when firms do pay dividends, the Canadian market confirms a negative relationship between the size of the firm and the dividend payout ratio. This implies that smaller firms have higher dividend payout ratios than larger firms. This finding is also consistent with the findings of Keim (1985) and Farinha (2002), who observed a significant negative relationship between the size of the firm and dividend payout ratio for the NYSE and the London Stock Exchange, respectively. This study has also documented that small firms spend as much on share repurchases as large firms. This observation is important given that small firms tend to experience high earnings volatility and therefore use share repurchases as much as large firms because it is financially more flexible than dividends. This finding throws further

light on the hypothesis that share repurchases have been substituting for dividends in Canada.

Table 23 Panel A: Effect of size measure by market capitalization on the decision to pay dividends or not pay dividends

Year	Coefficients			t-statistic			Significance		
	LN MV	PRSA	Constant	LN MV	PRSA	Constant	LN MV	PRSA	Constant
1987-2001	0.58797	-0.00089	-7.69688	39.03	-4.21	-42.89	0.0000	0.0000	0.0000
1987	0.82978	-0.02079	-8.71558	4.15	-0.76	-4.02	0.0000	0.4461	0.0001
1988	0.82996	-0.01576	-8.57712	5.24	-1.19	-5.06	0.0000	0.2346	0.0000
1989	0.84792	-0.03517	-8.90549	6.56	-1.33	-6.43	0.0000	0.1823	0.0000
1990	0.80931	-0.08879	-8.57894	8.38	-2.30	-8.34	0.0000	0.0214	0.0000
1991	0.73487	-0.00210	-8.23302	9.36	-0.90	-9.60	0.0000	0.3684	0.0000
1992	0.71083	-0.00138	-8.55612	9.37	-1.25	-9.90	0.0000	0.2100	0.0000
1993	0.68534	-0.00125	-8.76264	9.39	-1.11	-10.17	0.0000	0.2677	0.0000
1994	0.65996	-0.01726	-8.46576	9.94	-1.36	-10.81	0.0000	0.1728	0.0000
1995	0.57543	-0.00133	-7.52175	9.63	-1.44	-10.62	0.0000	0.1501	0.0000
1996	0.57451	-0.00119	-7.65757	10.77	-1.51	-11.89	0.0000	0.1321	0.0000
1997	0.69131	-0.00107	-9.25849	12.51	-1.19	-13.62	0.0000	0.2351	0.0000
1998	0.70028	0.00032	-9.35752	13.44	0.53	-14.70	0.0000	0.5974	0.0000
1999	0.61541	0.00002	-8.45095	13.40	0.04	-14.91	0.0000	0.9715	0.0000
2000	0.52967	0.00006	-7.42721	12.92	0.15	-14.70	0.0000	0.8789	0.0000
2001	0.66120	-0.00037	-9.00864	14.33	-0.79	-15.77	0.0000	0.4299	0.0000

Table 23 Panel A: Two independent variables are used in the binary logistic regression. LN MV is the natural log of market capitalization as a size measure. PRSA is the price-to-sales ratio used as a control for the signaling effect of dividends. The dependent variable is the decision to pay dividends or not. The dependent variable is (1) if dividend is paid and (0) if no dividend is paid. The analysis is performed for the combined period of 1987 to 2001 and each individual years, respectively.

Table 23 Panel B: Effect of size measure by total assets on the decision to pay dividends or not pay dividends

Year	Coefficients			t-statistic			Significance		
	LNTA	PRSA	Constant	LNTA	PRSA	Constant	LNTA	PRSA	Constant
1987-2001	0.18179	-0.00052	-3.41430	18.14	-2.71	-27.85	0.0000	0.0068	0.0000
1987	0.15097	-0.00655	-3.31909	2.23	-0.60	-3.91	0.0258	0.5460	0.0001
1988	0.13519	-0.00482	-2.81192	2.42	-0.80	-4.05	0.0156	0.4258	0.0001
1989	0.12516	-0.01267	-2.55432	2.49	-1.03	-4.11	0.0129	0.3039	0.0000
1990	0.19918	-0.02033	-3.33404	4.39	-1.08	-5.95	0.0000	0.2808	0.0000
1991	0.23199	-0.00135	-3.77123	5.53	-0.81	-7.39	0.0000	0.4166	0.0000
1992	0.25005	-0.00063	-4.20244	5.94	-0.64	-8.13	0.0000	0.5219	0.0000
1993	0.24214	-0.00093	-4.20407	5.59	-0.86	-7.95	0.0000	0.3890	0.0000
1994	0.20398	-0.01210	-3.75742	4.87	-1.41	-7.27	0.0000	0.1581	0.0000
1995	0.20861	-0.00063	-3.75702	5.27	-0.78	-7.76	0.0000	0.4338	0.0000
1996	0.21539	-0.00098	-3.79214	5.95	-1.27	-8.59	0.0000	0.2039	0.0000
1997	0.22977	-0.00088	-4.04810	6.45	-1.07	-9.27	0.0000	0.2864	0.0000
1998	0.20102	0.00030	-3.72812	5.94	0.59	-8.98	0.0000	0.5533	0.0000
1999	0.14526	-0.00022	-3.03299	4.57	-0.41	-7.82	0.0000	0.6788	0.0000
2000	0.12058	0.00008	-2.66450	3.91	0.20	-7.06	0.0001	0.8418	0.0000
2001	0.08276	-0.00032	-2.17357	2.68	-0.73	-5.82	0.0073	0.4676	0.0000

Table 23 Panel B: Two independent variables are used in the binary logistic regression. LNTA is the natural log of total assets as a size measure. PRSA is the price-to-sales ratio used as a control for the signaling effect of dividends. The dependent variable is the decision to pay dividends or not. The dependent variable is (1) if dividend is paid and (0) if no dividend is paid. The analysis is performed for the combined period of 1987 to 2001 and each individual years, respectively.

Table 23 Panel C: Effect of size measure by total sales on the decision to pay dividends or not pay dividends

Year	Coefficients			t-statistic			Significance		
	LNTS	PRSA	Constant	LNTS	PRSA	Constant	LNTS	PRSA	Constant
1987-2001	0.57164	-0.00056	-7.40052	41.05	-2.60	-44.97	0.0000	0.0094	0.0000
1987	0.76034	-0.01967	-7.89055	4.38	-0.75	-4.23	0.0000	0.4510	0.0000
1988	0.69736	-0.00598	-7.29455	5.51	-0.72	-5.29	0.0000	0.4692	0.0000
1989	0.79630	-0.01714	-8.50366	6.62	-0.79	-6.45	0.0000	0.4291	0.0000
1990	0.62416	-0.00714	-6.97914	7.89	-0.47	-7.91	0.0000	0.6368	0.0000
1991	0.60893	0.00033	-7.05123	8.77	0.12	-9.08	0.0000	0.9040	0.0000
1992	0.60005	-0.00087	-7.35817	9.29	-0.84	-9.94	0.0000	0.4028	0.0000
1993	0.52569	-0.00066	-6.71157	9.29	-0.61	-10.31	0.0000	0.5420	0.0000
1994	0.56469	-0.00523	-7.32055	10.08	-1.14	-11.13	0.0000	0.2540	0.0000
1995	0.56006	0.00007	-7.18471	10.88	0.07	-11.97	0.0000	0.9414	0.0000
1996	0.56629	-0.00089	-7.26531	12.11	-1.13	-13.35	0.0000	0.2585	0.0000
1997	0.63464	-0.00068	-8.27167	13.05	-0.81	-14.31	0.0000	0.4192	0.0000
1998	0.62301	0.00008	-8.31422	13.37	0.13	-14.80	0.0000	0.8990	0.0000
1999	0.62273	0.00027	-8.43469	14.02	0.47	-15.51	0.0000	0.6416	0.0000
2000	0.60337	0.00006	-8.22310	14.06	0.14	-15.52	0.0000	0.8861	0.0000
2001	0.60463	-0.00003	-8.29204	13.71	-0.07	-15.07	0.0000	0.9450	0.0000

Table 23 Panel C: Two independent variables are used in the binary logistic regression. LNTS is the natural log of total sales as a size measure. PRSA is the price-to-sales ratio used as a control for the signaling effect of dividends. The dependent variable is the decision to pay dividends or not. The dependent variable is (1) if dividend is paid and (0) if no dividend is paid. The analysis is performed for the combined period of 1987 to 2001 and each individual years, respectively.

Table 24 Panel A: Effect of size measure by market capitalization on the amount of dividends paid by firm

Year	Coefficients			t-statistic			Significance		
	LN MV	PRSA	Constant	LN MV	PRSA	Constant	LN MV	PRSA	Constant
1987-2001	-1.70455	-0.00496	89.66551	-1.29	-0.22	5.34	0.1976	0.8286	0.0000
1987	0.69557	-0.28906	37.19853	0.18	-1.02	0.80	0.8571	0.3106	0.4295
1988	1.23388	-0.66200	55.06454	0.16	-0.73	0.61	0.8696	0.4690	0.5437
1989	4.24889	-0.72379	8.81956	0.82	-0.66	0.14	0.4133	0.5087	0.8882
1990	0.86249	-0.08183	75.22207	0.13	-0.54	0.95	0.8968	0.5892	0.3428
1991	8.82619	-0.07009	0.45771	1.27	-0.45	0.01	0.2061	0.6513	0.9956
1992	-14.19725	-0.05979	269.60036	-1.40	-0.34	2.14	0.1650	0.7364	0.0342
1993	11.66711	0.02782	-72.46603	1.50	0.19	-0.76	0.1355	0.8460	0.4465
1994	2.54947	-0.05763	25.54745	0.47	-0.46	0.37	0.6407	0.6452	0.7083
1995	-0.90417	0.12580	56.88199	-0.29	1.69	1.45	0.7743	0.0924	0.1477
1996	-1.55933	-0.00718	83.90997	-0.33	-0.06	1.41	0.7403	0.9500	0.1602
1997	-3.64902	-0.09029	108.31097	-0.96	-0.95	2.20	0.3385	0.3438	0.0286
1998	-3.67617	-0.05139	114.37403	-0.79	-0.82	1.86	0.4314	0.4118	0.0637
1999	-7.43491	-0.05387	165.47997	-1.88	-0.82	3.18	0.0615	0.4157	0.0017
2000	-6.54873	0.07844	142.79897	-1.83	1.94	3.02	0.0683	0.0540	0.0028
2001	-4.74110	-0.04259	150.06938	-0.93	-0.72	2.20	0.3524	0.4701	0.0290

Table 24 Panel A: Two independent variables are used in the OLS regression. LN MV is the natural log of market capitalization as a size measure. PRSA is the price-to-sales ratio used as a control for the signaling effect of dividends. The dependent variable is the dividend payout ratio of the firm. The analysis is performed for the combined period of 1987 to 2001 and each individual years, respectively.

Table 24 Panel B: Effect of size measure by total assets on the amount of dividends paid by the firm

Year	Coefficients			t-statistic			Significance		
	LNTA	PRSA	Constant	LNTA	PRSA	Constant	LNTA	PRSA	Constant
1987-2001	1.44882	-0.00912	51.33546	1.22	-0.42	3.49	0.2224	0.6721	0.0005
1987	2.48222	-0.04863	21.90268	0.51	-0.97	0.37	0.6135	0.3343	0.7160
1988	5.65700	-0.06595	-0.99429	0.87	-0.47	-0.01	0.3889	0.6367	0.9901
1989	4.87946	-0.04046	-2.06799	1.03	-0.38	-0.04	0.3066	0.7068	0.9717
1990	4.53468	-0.06644	29.70570	0.73	-0.62	0.39	0.4654	0.5393	0.7008
1991	11.33994	-0.04158	-34.11859	1.72	-0.27	-0.42	0.0882	0.7900	0.6761
1992	-2.41567	-0.07433	124.27203	-0.31	-0.40	1.26	0.7595	0.6868	0.2120
1993	5.48443	0.06022	2.10734	0.87	0.41	0.03	0.3840	0.6795	0.9781
1994	3.80419	-0.05362	10.37050	0.78	-0.43	0.17	0.4381	0.6655	0.8647
1995	-1.04766	0.11440	61.42241	-0.36	1.43	1.68	0.7217	0.1536	0.0937
1996	3.94539	0.00436	19.48787	0.87	0.04	0.35	0.3830	0.9717	0.7270
1997	0.65688	-0.07938	54.31019	0.20	-0.83	1.30	0.8447	0.4072	0.1937
1998	-3.79012	-0.05977	113.07778	-1.01	-0.96	2.41	0.3138	0.3378	0.0168
1999	-3.22945	-0.05976	108.51851	-1.02	-0.89	2.76	0.3088	0.3724	0.0062
2000	-0.92480	0.08397	69.30304	-0.30	2.06	1.83	0.7629	0.0406	0.0688
2001	2.52413	-0.02848	56.39738	0.58	-0.48	1.06	0.5609	0.6336	0.2895

Table 24 Panel B: Two independent variables are used in the OLS regression. LNTA, the natural log of total assets, is the size measure. PRSA is the price-to-sales ratio used as a control for the signaling effect of dividends. The dependent variable is the dividend payout ratio of the firm. The analysis is performed for the combined period of 1987 to 2001 and each individual years, respectively.

Table 24 Panel C: Effect of size measure by total sales on the amount of dividends paid by the firm

Year	Coefficients			t-statistic			Significance		
	LNTS	PRSA	Constant	LNTS	PRSA	Constant	LNTS	PRSA	Constant
1987-2001	-4.49210	-0.03958	124.86489	-3.84	-1.77	8.46	0.0001	0.0771	0.0000
1987	0.46473	-0.05472	46.41813	0.11	-1.11	0.91	0.9141	0.2716	0.3660
1988	-3.94523	-0.09285	113.15472	-0.65	-0.67	1.53	0.5203	0.5073	0.1297
1989	4.75490	-0.04365	0.26007	1.08	-0.41	0.00	0.2834	0.6825	0.9961
1990	-4.71737	-0.10194	141.33456	-0.86	-0.68	2.12	0.3940	0.4958	0.0364
1991	3.36622	-0.07928	63.69482	0.50	-0.25	0.79	0.6164	0.8014	0.4289
1992	3.03495	-0.05899	57.21896	0.38	-0.33	0.58	0.7056	0.7399	0.5661
1993	-1.87897	0.03690	90.40358	-0.32	0.26	1.30	0.7473	0.7969	0.1972
1994	3.46879	-0.67157	16.66668	0.73	-0.58	0.28	0.4654	0.5631	0.7828
1995	-3.40323	0.10711	89.91169	-1.26	1.37	2.69	0.2106	0.1733	0.0078
1996	-7.79196	-0.04756	162.63355	-1.84	-0.39	3.08	0.0679	0.6976	0.0023
1997	-7.48632	-0.09985	155.33075	-2.22	-1.06	3.66	0.0271	0.2893	0.0003
1998	-8.01810	-0.05285	169.15970	-1.92	-0.86	3.13	0.0564	0.3886	0.0020
1999	-12.37202	-0.05937	228.71230	-3.39	-0.92	4.79	0.0008	0.3595	0.0000
2000	-7.32688	-0.02233	155.16672	-2.28	-0.61	3.62	0.0235	0.5453	0.0004
2001	-12.20364	-0.04082	247.82650	-2.54	-0.66	3.85	0.0118	0.5083	0.0002

Table 24 Panel C: Two independent variables are used in the OLS regression. LNTS, the natural log of total sales, is the size measure. PRSA is the price-to-sales ratio used as a control for the signaling effect of dividends. The dependent variable is the dividend payout ratio of the firm. The analysis is performed for the combined period of 1987 to 2001 and each individual years, respectively.

4.6 Liquidity Constraint

The objective of this section of the study is to examine whether the liquidity situation of firms in Canada can partially explain changes in dividend payout over time. From the empirical and theoretical literature, investment decisions are sensitive to the liquidity of the firm. Given that dividend payments impact the ability of the firm to finance investments from internal cash resources, it is conceivable that dividend payouts may well be a function of the extent to which the firm is liquidity-constrained. As far as the existing literature is concerned, this study is the first empirical test of the effects of liquidity on dividend payout.

4.6.1 Description of Liquidity Constraint Classification System

To analyze the impact of liquidity on dividend payment patterns, a classification system is required in order to segregate firms into various classes of liquidity constraint. This study classifies firms into various deciles ranging from least constrained to severely constrained in accordance with the firm's Mean Rank Liquidity Index (MR_{LI}) shown in equation 6 under section 3.2.4 above. Table 25 below describes the various liquidity constraint measures used in ranking firms into three classifications, namely, Least Constrained ("LC"), Partially constrained ("PC"), and Severely constrained ("SC").

To derive the Mean Rank Liquidity Index, each firm is ranked based on the selected liquidity measures as shown in table 25. Secondly, using SPSS (Transform-Rank Case Function), the selected variables are ranked by selecting the rank type and assigning the mean of the ranks for ties. The actual ranking is performed based on table 26 below. The mean rank liquidity index is determined by computing the mean of the ranks used for

each firm-year. Based on the mean ranks, each year's data is sorted in ascending order. For each year, the top one-third firms are classified as Least-Constrained, the middle one-third firms are classified as Partially-Constrained, and the bottom one-third firms are classified as Severely-Constrained.

Table 25: Description of liquidity constraints measures used in the rankings

Variable	SPSS Code	Description of proxy measure
Size	lnmv	Natural log of Market Value (market capitalization) measured as the product of the beginning of period share price and the outstanding number of common shares.
Maturity	maturity	Considering that Stock Guide database started in 1985, we make an assumption that companies which were listed at that time or before that time are classified as matured. These companies will have their number of shares field populated. Those classified as immature are those with the number of shares field commencing after 1985. These companies were listed on the stock exchange from that time. To ensure that the sample is clean, all companies with the number of share field populated in 1985 but which went out of business within the next five years were classified as immature. These represented five companies in total. Thus, the companies classified as matured have at least 12 continuous years of data from 1985.
Collateralized Assets	manufact	Manufacturing firms are classified as 1 and non-manufacturing firms as 0. Manufacturing firms have specialized assets and therefore their resale are less marketable and cannot readily serve as collateral. The inverse is true for non-manufacturing firms.
Current Ratio	cura	It is a measure of short-term liquidity. The higher the ratio, the lower the liquidity constraint.
Debt Ratio	dera	It is a measure of leverage. The lower the ratio, the lower the liquidity constraint.
Interest Coverage Ratio	inco	It is a measure of coverage. The higher the ratio, the lower the liquidity constraint.
Cash Flow to Debt	cftd	Cash flow divided by total debt. The higher the ratio, the lower the liquidity constraint.

Net Profit Margin %	nepr	Net profit divided by net revenue. The higher the ratio, the lower the liquidity constraint.
Gross Margin %	grma	Gross profit divided by net revenue. The higher the ratio, the lower the liquidity constraint.
Slack	slak	Cash + short term investments + (0.50 * inventory) + (0.70 * accounts receivable) – short term loans. The higher the ratio, the lower the liquidity constraint.
Investment-Cash Flow Ratio	incf	Capital Expenditure divided by Cash Flow from operations. The higher the ratio, the lower the liquidity constraint.

Table 26: Actual ranking of the liquidity constrained measures

Maturity:	Assign 1 to the largest value which represents the best rank and least constraint
Collateralized assets:	Assign 1 to the smallest value which represents the best rank and least constraint.
Size:	Assign 1 to the largest value which represents the best rank and least constraint
Current Ratio:	Assign 1 to the largest value which represents the best rank and least constraint
Interest Coverage Ratio:	Assign 1 to the largest value which represents the best rank and least constraint
Cash Flow to Debt:	Assign 1 to the largest value which represents the best rank and least constraint
Net Profit Margin %:	Assign 1 to the largest value which represents the best rank and least constraint
Gross Margin %:	Assign 1 to the largest value which represents the best rank and least constraint
Slack:	Assign 1 to the largest value which represents the best rank and least constraint
Investment-Cash Flow Ratio:	Assign 1 to the largest value which represents the best rank and least constraint
Debt Ratio:	Assign 1 to the lowest value which represents the best rank and least constraint

4.6.2 Liquidity Constraint Classification Results

One of the important merits of the mean rank liquidity index classification system is its capacity to allow the firms to move from one group of liquidity constraint to another, depending on the severity of its liquidity situation in the year in question. Table 27 shows the distribution of firms across the sample period based on liquidity constraint using the mean rank index. Table 28 below displays the year-by-year turnover of firms from one class of liquidity status to another. When viewed on the basis of individual years, 45.47% of the firms on average experienced a turnover from one class of liquidity constraint to another for the period from 1987 to 2001 with a minimum turnover rate of 38.41% in 2001 and a maximum rate of 53.09% in 1995. When viewed on the basis of individual firms, 35.5% of the fifteen year period experienced turnovers between the three groups of liquidity constraint with minimum turnover of 0% and maximum turnover of 100%. Indeed, 4,599 of the 13,843 firm-year observations (33.22%) experienced a turnover between the three groups of liquidity constraint. The observed turnover between the three groups of liquidity constraint is a confirmation that liquidity constraint status of the firm changes continuously and that the classification system is working as intended.

Table 29 also displays correlations among the variables used in classifying the firms into LC group, PC group, and SC group, respectively. The largest correlation between liquidity status and the independent variables is -0.51 with size (measured by the natural log of market value), -0.31 for Net Profit ratio, and -0.31 for Cash flow to Debt ratio. These observations show that there is a strong negative relationship between liquidity status and the identified ranking variables.

Table 27: Distribution of firms across the sample period based on liquidity constraint classification

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	1988
Least Constrained	108	126	148	188	238	279	305	320	372	414	427	443	443	414	374
Partially Constrained	109	128	150	189	239	280	305	343	373	415	427	443	445	415	373
Severely Constrained	108	126	148	187	238	279	305	331	372	414	427	443	443	414	375
Total	325	380	446	564	715	838	915	994	1117	1243	1281	1329	1331	1243	1122

Table 28: Turnover of firms between different classes of liquidity status

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Liquidity status turnover	162	183	232	360	403	443	440	593	602	586	622	582	552	431
Total firms	380	446	564	715	838	915	994	1117	1243	1281	1329	1331	1243	1122
% Turnover	42.63%	41.03%	41.13%	50.35%	48.09%	48.42%	44.27%	53.09%	48.43%	45.75%	46.80%	43.73%	44.41%	38.41%

Table 29: Pearson Correlation among variables used in ranking

	Size -Market Value	Price-to- Book Ratio	Return On Assets	Current Ratio	Debt Ratio	Cash Flow to Debt	Gross Margin	Interest Coverage	Net Profit Ratio	Investment to Cash Flow Ratio	Slak	Liquidity Status
Size - market value	1											
Price-to-book ratio	-0.22**	1										
Return on assets	0.18**	-0.27**	1									
Current Ratio	-0.04**	-0.04**	0.01	1								
Debt Ratio	-0.12**	0.38**	-0.39**	-0.02*	1							
Cash Flow to Debt	-0.04**	-0.06**	0.08**	0.17**	-0.02	1						
Gross Margin	0.10**	-0.07**	0.33**	-0.14**	-0.07**	0.07**	1					
Interest Coverage	-0.04**	-0.04**	-0.01	0.22**	0.00	0.37**	-0.07**	1				
Net Profit Ratio	0.14**	-0.08**	0.44**	-0.09**	-0.07**	0.09**	0.83**	-0.090**	1			
Investment to Cash Flow Ratio	0.01	0.00	0.01	-0.01	0.00	0.02**	0.03**	-0.018*	0.023**	1		
Slack	0.26**	-0.02**	0.02*	-0.02	-0.01	-0.03**	0.03**	0.079**	0.031**	0.00	1	
Liquidity status	-0.51**	0.24**	-0.29**	-0.06**	0.11**	-0.31**	-0.28**	-0.218**	-0.310**	-0.04**	-0.11**	1

Liquidity status defined as 1=least constrained; 2=partial constrained; 3=severely constrained. A full description of the variables and their definition is included in the Appendix.

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Quantitative measures of operational and financial health across the three classifications, as summarized in table 30 below and fully detailed in table 31 Panel A to F for mean and median values, indicate that the classification system has successfully captured the desired cross-sectional properties for the period 1987 to 2001. Financial ratios are superior for the LC group and inferior for the SC group with the PC group lying in between. For instance the LC group has a mean debt ratio of 0.16, signifying very low leverage, compared to the mean debt ratio of 20.66 for the SC group, implying high leverage. High-leveraged firms are severely constrained while low-leveraged firms are the least constrained in terms of their ability to access external capital. On the basis of profitability of the firms, the classification system is successful in capturing the degree of liquidity constraint. The average net profit margin, gross profit margin, and average return on assets are consistently negative for the SC firms and positive for the LC firms, with the PC firms lying somewhere in between.

Table 30: Selected financial statistic means for liquidity constrained groups

Key Mean Financial Statistics	Least Constrained ("LC") firms	Partially Constrained ("PC") firms	Severely Constrained ("SC") firms
Current Ratio	4.66	3.74	2.78
Debt Ratio	0.16	1.64	20.66
Interest Coverage	308.47	151.96	90.48
Cash flow-to-Debt Ratio	195.30	20.57	1.61
Net Profit %	16.44	-21.31	-124.38
Gross Margin %	17.52	4.18	-57.43
Slack	1,223,278	317,111	37,105
Investment-to-Cash flow Ratio	1.35	2.35	-0.75
Price-to-Book Ratio	4.64	14.63	126.71
Return on Assets %	7.21	0.55	-28.13
Market Capitalization	1,472,909	405,388	72,116
Total Assets	2,432,985	1,549,204	1,208,655
Cash and Equivalents	285,859	77,122	16,999
Total Revenue	479,476	186,486	36,088
Cash from Operations	953,083	473,006	91,471
Capital Expenditure	115,121	46,063	9,599

The same conclusion goes for the coverage ratios such as interest coverage and cash flow-to-debt. Investment sensitivity to cash flow measured by the investment-to-cash flow ratio also indicates a mean ratio of -0.75 for the SC group, the lower ratio indicating a higher liquidity constraint. Finally, other financial indicators such as slack (a measure of the amount of funds or liquidity immediately available to a firm at year-end), market capitalization, total assets, total revenue, cash from operations, and capital expenditures all consistently decline in the SC group compared to the LC group. The LC group shows the largest mean values and the SC group shows the lowest mean values, while the mean values for the PC group lie in between.

Table 31: Panel A: Mean summary statistics for least constrained firm characteristics

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Current Ratio	7.43	4.12	3.67	3.31	3.56	4.52	6.71	6.56	4.63	4.13	4.74	4.27	3.42	4.35	4.43
Debt Ratio	0.10	0.14	0.16	0.16	0.18	0.18	0.13	0.14	0.17	0.14	0.16	0.17	0.18	0.16	0.18
Interest Coverage	355.05	310.94	316.75	278.52	291.30	288.58	294.39	325.02	341.73	320.42	316.55	313.43	278.51	294.56	301.34
Cash flow-to-Debt Ratio	238.09	164.78	200.81	181.88	186.86	200.30	229.42	206.86	203.83	217.37	195.18	181.63	158.92	179.21	184.31
Net Profit %	22.14	16.53	15.77	14.98	10.41	13.88	16.18	19.79	26.14	19.76	11.96	15.19	17.59	14.70	11.60
Gross Margin %	21.00	16.48	16.31	17.70	13.39	15.31	19.21	19.10	15.14	19.79	17.41	15.97	17.36	21.10	17.57
Slack	886,904	989,590	1,283,925	930,252	1,260,329	850,118	715,964	888,035	1,083,098	1,061,176	1,397,888	1,339,146	1,617,791	1,872,095	2,172,86
Investment-to-Cash flow Ratio	0.92	0.91	2.57	1.06	1.22	0.98	1.40	1.19	2.06	1.53	1.55	0.93	0.94	1.83	1.23
Price-to-Book Ratio	2.60	2.00	9.07	1.85	2.04	6.28	6.24	5.31	5.62	2.71	5.40	7.50	5.16	5.56	2.30
Return on Assets %	8.64	7.93	7.38	6.71	5.02	5.82	6.89	8.22	8.46	7.38	6.94	7.37	7.13	8.40	5.84
Market Capitalization	1,737,671	1,893,605	1,687,736	1,355,206	1,239,930	796,283	589,522	726,698	976,585	1,105,156	1,443,088	1,531,625	2,194,943	2,793,493	2,022,09
Total Assets	3,613,230	2,975,200	4,235,448	2,486,392	3,210,612	1,510,915	1,276,362	1,632,030	2,071,149	1,621,180	2,173,758	2,374,655	2,429,566	2,365,365	2,518,92
Cash and Equivalents	321,123	327,941	329,245	318,206	294,881	207,011	157,143	227,360	283,460	261,104	310,649	275,587	319,712	305,343	349,120
Total Revenue	1,571,446	1,799,356	1,907,031	209,459	177,129	120,040	70,024	108,503	130,429	121,666	141,669	145,101	174,160	253,609	262,512
Cash from Operations	241,002	270,624	259,358	1,644,971	1,479,643	794,326	475,338	676,315	881,797	787,671	995,844	1,115,801	1,296,972	1,574,417	1,802,17
Capital Expenditure	134,888	170,054	176,470	147,214	121,562	72,753	38,676	57,402	75,447	86,614	103,803	98,715	113,929	145,259	184,032

Table 31: Panel B: Median summary statistics for least constrained firm characteristics

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Current Ratio	2.48	2.21	2.36	2.16	1.99	1.88	2.08	2.08	2.24	2.13	1.99	1.98	1.93	1.90	1.99
Debt Ratio	0.01	0.07	0.10	0.11	0.15	0.15	0.08	0.07	0.11	0.09	0.12	0.12	0.13	0.11	0.13
Interest Coverage	45.38	19.11	18.95	12.49	9.02	9.59	15.06	26.18	21.53	20.44	22.67	17.28	15.32	18.53	15.93
Cash flow-to-Debt Ratio	2.09	1.04	0.98	0.98	0.93	0.89	1.45	1.54	1.21	1.23	0.88	0.93	0.88	1.09	0.98
Net Profit %	9.94	8.81	8.19	7.83	5.99	7.89	10.94	11.74	9.76	10.92	9.91	8.75	8.89	10.86	8.44
Gross Margin %	15.81	13.92	13.75	12.89	9.86	12.69	15.05	16.43	15.33	16.52	15.09	12.79	13.62	16.70	12.87
Slack	42,298	51,849	43,495	45,456	31,397	24,310	20,893	30,515	32,084	30,202	39,976	43,074	44,594	50,062	52,419
Investment-to-Cash flow Ratio	0.56	0.54	0.58	0.65	0.58	0.57	0.56	0.58	0.58	0.74	0.60	0.55	0.62	0.60	0.61
Price-to-Book Ratio	1.63	1.46	1.56	1.27	1.41	1.63	2.12	1.66	1.68	2.07	2.02	1.85	1.87	1.90	1.62
Return on Assets %	8.00	7.66	5.94	5.61	4.17	4.57	5.43	6.32	6.44	5.97	5.88	5.96	6.09	6.65	5.91
Market Capitalization	157,700	201,987	180,776	162,500	116,348	141,685	142,344	148,551	181,008	216,125	272,763	217,022	258,976	257,968	279,494
Total Assets	278,256	173,422	155,236	170,088	104,171	90,277	79,342	116,954	90,782	90,473	111,977	99,188	95,544	98,755	87,822
Cash and Equivalents	9,848	12,022	9,657	8,345	5,459	5,570	5,000	6,727	8,871	7,489	9,010	9,115	8,544	8,212	10,290
Total Revenue	68,433	184,433	160,609	18,401	11,276	12,475	10,666	14,646	14,698	15,412	20,365	17,600	22,689	25,007	29,371
Cash from Operations	7,519	18,736	20,205	153,371	98,121	82,526	49,487	70,815	74,986	76,941	99,536	118,045	118,295	131,207	184,000
Capital Expenditure	4,126	10,338	11,223	11,244	5,775	6,212	6,922	9,648	8,591	9,372	12,217	10,221	13,514	14,680	15,044

Table 31 Panel C: Mean summary statistics for partially constrained firm characteristics

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Current Ratio	6.09	4.64	4.22	2.56	3.60	2.51	3.40	3.03	3.09	4.12	3.23	3.75	4.01	4.10	3.71
Debt Ratio	0.26	0.30	0.33	0.33	4.60	7.57	0.34	3.34	3.01	0.28	0.30	0.33	0.33	0.31	2.98
Interest Coverage	188.37	142.40	137.42	109.20	115.31	117.29	140.56	150.41	143.78	168.95	157.80	171.85	164.04	182.23	189.86
Cash flow-to-Debt Ratio	46.48	24.06	27.12	16.31	21.39	19.29	17.01	24.17	13.89	24.10	28.34	10.96	17.59	10.99	6.83
Net Profit %	0.42	2.46	-11.98	-24.83	-12.96	-15.64	-13.43	-13.91	-19.90	-20.71	-20.56	-44.73	-45.60	-31.30	-47.00
Gross Margin %	15.36	12.07	10.65	11.16	6.95	7.62	7.09	6.85	2.54	0.89	0.86	1.27	-8.16	-4.44	-7.95
Slack	443,003	1,041,548	311,574	492,409	102,304	577,480	263,210	233,185	120,610	134,221	112,211	290,393	197,635	164,560	272,31
Investment Cash flow Ratio	10.32	1.03	2.61	2.12	1.92	1.33	1.14	1.60	3.30	2.20	3.35	2.18	1.14	0.46	0.52
Price-to-Book Ratio	22.95	18.26	5.62	6.99	16.31	24.60	13.95	15.38	11.49	16.07	10.05	14.74	17.53	10.07	15.39
Return on Assets %	5.78	3.55	2.66	-1.97	4.79	1.29	3.85	2.93	1.78	1.03	-0.10	-4.79	-2.94	-1.60	-8.06
Market Capitalization	361,554	372,567	285,826	251,441	218,157	390,210	580,472	468,046	313,822	435,931	425,723	382,770	475,792	576,987	541,52
Total Assets	135,095	3,471,053	673,375	1,900,004	472,896	2,099,774	661,847	1,031,051	919,359	2,149,822	1,331,764	1,551,139	1,694,703	2,790,140	2,356,03
Cash and Equivalents	187,220	241,317	124,375	78,804	32,884	70,647	73,606	60,874	38,117	33,051	32,289	41,834	44,359	48,145	49,301
Total Revenue	665,241	853,512	677,308	63,270	26,563	57,988	63,962	54,287	39,638	46,036	44,613	49,106	53,992	67,899	33,870
Cash from Operations	46,870	60,626	35,060	682,603	410,402	653,794	644,993	654,074	387,480	489,749	473,228	575,193	546,557	794,598	639,85
Capital Expenditure	28,794	39,823	36,402	48,461	33,812	33,763	54,379	52,042	35,992	44,723	49,342	74,638	55,687	55,665	47,417

Table 31 Panel D: Median summary statistics for partially constrained firm characteristics

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Current Ratio	1.85	1.72	1.63	1.51	1.40	1.44	1.52	1.55	1.50	1.59	1.52	1.50	1.45	1.53	1.53
Debt Ratio	0.22	0.27	0.34	0.33	0.39	0.37	0.29	0.30	0.31	0.26	0.29	0.33	0.32	0.30	0.30
Interest Coverage	8.67	4.54	3.00	2.43	1.82	2.25	3.62	4.52	3.54	4.68	4.45	3.16	3.31	4.13	3.26
Cash flow-to-Debt Ratio	0.45	0.25	0.18	0.21	0.19	0.21	0.29	0.28	0.27	0.27	0.25	0.18	0.21	0.21	0.18
Net Profit %	5.61	4.50	3.33	2.14	0.99	1.69	3.79	4.27	4.08	3.31	3.29	2.24	2.57	3.03	1.49
Gross Margin %	10.57	8.44	9.12	8.12	5.52	5.75	7.62	7.97	8.39	6.53	7.41	6.67	7.94	7.29	5.57
Slack	14,985	13,393	13,317	10,973	8,514	9,117	11,840	14,815	11,289	14,259	13,885	12,801	12,924	15,407	17,818
Investment-to-Cash flow Ratio	0.58	0.78	0.67	0.78	0.76	0.54	0.56	0.65	0.67	0.67	0.72	0.70	0.57	0.50	0.46
Price-to-Book Ratio	1.46	1.26	1.22	1.03	1.13	1.24	1.69	1.47	1.41	1.60	1.60	1.29	1.36	1.26	1.22
Return on Assets %	5.80	3.84	3.39	1.79	0.94	1.51	3.12	3.80	2.98	2.71	2.36	1.40	1.88	2.75	1.20
Market Capitalization	72,923	51,300	66,912	38,910	39,392	48,465	77,740	70,862	66,168	87,846	85,040	69,099	69,011	64,641	65,077
Total Assets	51,886	68,039	108,992	92,606	68,184	70,476	66,574	93,882	88,788	90,220	79,280	89,523	73,580	83,329	101,319
Cash and Equivalents	2,742	1,784	1,388	890	932	755	2,086	2,091	1,208	2,183	2,182	1,940	2,353	3,192	2,609
Total Revenue	80,405	86,776	94,244	6,370	4,465	4,755	5,940	7,417	6,174	5,002	5,833	5,284	6,213	7,040	6,120
Cash from Operations	6,533	6,619	6,493	78,889	66,200	53,785	57,300	64,485	48,333	44,371	51,526	56,276	55,699	78,026	88,351
Capital Expenditure	3,994	4,198	5,426	6,237	3,796	3,618	5,961	5,277	5,688	5,667	5,987	4,627	5,800	5,223	5,810

Table 31 Panel E: Mean summary statistics for severely constrained firm characteristics

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Current Ratio	2.20	4.89	2.48	2.99	2.23	2.35	2.57	3.42	2.52	3.26	2.83	2.54	2.12	2.99	2.36
Debt Ratio	9.65	8.87	7.24	21.86	13.25	25.89	3.93	18.93	19.42	22.24	19.13	20.90	41.10	36.93	40.63
Interest Coverage	104.72	102.43	80.65	44.40	59.07	89.85	79.26	104.28	127.23	112.28	104.06	87.92	105.32	84.03	71.70
Cash flow-to-Debt Ratio	8.54	15.94	12.43	5.03	3.79	-0.31	-4.10	3.07	-2.28	3.18	-1.82	-0.82	-4.35	-2.65	-11.46
Net Profit %	-74.64	-80.68	-80.33	-83.31	-127.87	-117.38	-89.69	-108.05	-104.08	-119.71	-167.61	-187.07	-171.64	-163.39	-190.28
Gross Margin %	-24.27	-34.59	-34.04	-17.05	-36.76	-26.91	-29.78	-42.62	-49.98	-71.11	-81.36	-100.33	-100.82	-100.06	-111.72
Slack	242,580	16,354	6,023	9,737	15,389	18,131	31,925	16,324	9,134	12,004	14,583	21,663	23,730	21,065	97,935
Investment Cash flow Ratio	-0.13	-1.97	-0.30	-0.21	0.66	0.02	-1.21	-2.04	-0.91	-3.09	0.73	-1.18	0.32	-1.51	-0.48
Price-to-Book Ratio	100.03	109.50	123.51	161.24	193.71	156.86	112.69	86.43	87.37	78.21	94.33	122.18	143.13	148.70	182.75
Return on Assets %	-5.33	-11.38	-26.41	-28.92	-32.21	-29.76	-12.35	-22.97	-21.85	-21.33	-33.12	-37.49	-43.66	-35.34	-59.79
Market Capitalization	114,846	45,212	29,969	31,490	53,254	41,374	92,668	56,642	65,259	74,186	63,294	59,995	97,003	91,760	164,79
Total Assets	675,933	708,042	453,180	465,512	289,961	354,546	503,629	805,515	902,529	750,030	1,696,479	2,035,147	2,426,137	2,454,441	3,608,74
Cash and Equivalents	137,636	6,763	1,777	3,008	3,705	5,790	9,833	6,964	4,955	6,836	8,541	6,970	7,264	9,184	35,764
Total Revenue	341,011	143,700	98,779	90	(1,632)	(2,219)	2,890	2,495	3,918	2,167	(771)	(902)	(3,214)	(2,908)	(42,077)
Cash from Operations	8,860	5,893	2,258	135,898	118,023	130,881	228,755	102,537	100,337	73,115	61,681	65,576	67,910	77,834	192,51
Capital Expenditure	14,853	7,741	7,703	8,767	9,407	5,451	10,778	6,399	7,554	8,095	10,479	12,155	9,657	10,387	14,566

Table 31 Panel F: Median summary statistics for severely constrained firm characteristics

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Current Ratio	1.47	1.30	1.15	1.14	1.09	1.20	1.34	1.31	1.20	1.35	1.30	1.14	1.14	1.26	1.15
Debt Ratio	0.33	0.32	0.35	0.42	0.42	0.44	0.41	0.35	0.38	0.36	0.32	0.36	0.36	0.31	0.29
Interest Coverage	2.25	1.32	0.21	-0.63	-1.80	-0.58	0.65	0.97	0.37	0.10	-1.60	-3.31	-1.54	-1.87	-4.00
Cash flow-to-Debt Ratio	0.12	0.06	0.01	-0.01	-0.03	-0.02	0.01	0.00	-0.01	0.00	0.00	-0.01	-0.07	-0.09	-0.17
Net Profit %	1.04	-1.89	-5.47	-12.29	-20.78	-11.91	-4.03	-5.63	-10.38	-11.82	-20.72	-38.78	-26.28	-31.31	-42.08
Gross Margin %	5.73	3.36	0.00	-0.02	-1.98	-1.32	1.68	1.15	-1.39	-2.89	-6.24	-16.25	-12.31	-14.05	-17.25
Slack	4,884	2,000	1,404	1,933	1,304	1,984	3,377	3,247	2,273	3,504	3,059	2,166	2,534	3,773	3,135
Investment-to-Cash flow Ratio	0.47	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	-0.04	-0.02	-0.05	-0.08	-0.10
Price-to-Book Ratio	1.55	1.01	1.17	0.87	1.11	1.31	1.75	1.68	1.75	2.07	2.14	1.44	1.81	1.96	2.12
Return on Assets %	0.95	-1.39	-4.10	-7.23	-10.48	-7.54	-3.53	-2.31	-5.93	-5.36	-10.13	-15.96	-14.06	-14.15	-23.53
Market Capitalization	19,975	15,269	10,752	6,631	7,768	7,704	20,536	16,615	18,787	21,438	18,209	12,999	14,592	17,735	12,918
Total Assets	48,176	30,646	25,942	31,239	26,074	22,886	37,749	33,540	30,747	37,631	42,454	44,904	49,128	60,406	69,840
Cash and Equivalents	468	357	79	85	60	150	296	326	309	560	966	439	637	1,038	911
Total Revenue	32,559	20,509	14,785	(101)	(257)	(222)	195	43	(144)	(185)	(377)	(341)	(720)	(872)	(1,912)
Cash from Operations	1,696	818	95	18,122	12,019	12,869	21,368	12,300	9,268	8,558	7,523	8,584	7,737	11,327	11,555
Capital Expenditure	1,668	1,712	1,029	838	513	447	628	917	805	989	1,099	812	550	889	717

As a further check of the efficacy of the liquidity constraint classification system, table 32 shows a binary logit model of the likelihood of a firm falling into least constrained or severely constrained category. The results show that the likelihood of being classified as Least Constrained instead of Severely Constrained is significantly greater in firms with larger size based on their market value, higher return on assets, higher current ratio, higher cash flow to debt ratio, higher gross margin and net profit ratio, and higher interest coverage ratio. On the other hand, the likelihood of being classified as least constrained is significantly lower in firms with higher debt ratio and higher price-to-book ratio.

Table 32: Logit for predictability of liquidity constrained status

	B	S.E.	Wald	df	Sig.	t-statistic
Size - market value	0.9343	0.0289	1043.4880	1.0000	0.0000	32.30
Price-to-book ratio	-0.0047	0.0017	7.7815	1.0000	0.0053	-2.79
Return on assets	0.0889	0.0052	289.3628	1.0000	0.0000	17.01
Current Ratio	0.1054	0.0151	48.9342	1.0000	0.0000	7.00
Debt Ratio	-8.8777	0.2741	1048.7497	1.0000	0.0000	-32.38
Cash Flow to Debt	0.0025	0.0002	112.8750	1.0000	0.0000	10.62
Gross Margin	0.0822	0.0032	678.3148	1.0000	0.0000	26.04
Interest Coverage	0.0015	0.0002	85.6383	1.0000	0.0000	9.25
Net Profit Ratio	0.0162	0.0024	46.4755	1.0000	0.0000	6.82
Investment to Cash Flow Ratio	0.0044	0.0018	6.0061	1.0000	0.0143	2.45
Slak	0.0000	0.0000	0.4332	1.0000	0.5104	-0.66
Constant	-10.8014	0.3264	1095.0493	1.0000	0.0000	-33.09

Liquidity status defined as 1=least constrained; 0=severely constrained. A full description of the variables and their definition is included in the Appendix.

Overall, the results provide strong quantitative confirmation of the Mean Rank Liquidity Index (MR_{LI}) as a credible methodology for classifying firms into least constrained, partially constrained, and severely constrained. The methodology also allows firms to move from one category to another over the sample period as their liquidity constraint situation changes from time to time. On average, 45.47% of the firms experienced a turnover from one class of liquidity

constraint to another for each year for the period from 1987 to 2001 based on the mean rank liquidity index. This observation is consistent with the results of the methodology adopted by Cleary (1999). Using the financial constraint index (Z_{FC}) based on multiple discriminant analysis, Cleary (1999) observed average turnover rates for the not financially constrained, partially financially constrained, and financially constrained groups to be 40.9%, 52.3%, and 37.3%, respectively. The fundamental analysis also confirms the classification method because the mean values of the selected variables were far worse for severely constrained firms than the least constrained firms, with the partially constrained firms lying somewhere in between. The foregoing observation is consistent with the results derived by the different classification systems adopted by Kaplan and Zingales (1997) and Cleary (1999).

4.6.3 Discussion of Dividend-Liquidity Constraint Sensitivity Regression Results

Table 33 shows the regression estimates for the entire sample and for each of the three liquidity groups, namely, LC group, PC group, and SC group, as well the empirical test of significant differences between the groups. From the entire sample, the amount of dividend payout is negatively sensitive to investment opportunities, measured by market-to-book ratio, with a beta estimate of -0.068 and a significant *t*-statistic of -2.469. The negative relationship between dividend payment decisions and investment opportunities is consistent with the theoretical proposition of this study given that dividend payments diminish internal funds available for investment decisions. Dividend payout is even more sensitive and positively impacted by liquidity, measured by cash flow, with beta estimate of 0.15 and *t*-statistic of 11.075. Dividend payout decisions are therefore sensitive to the availability of internal funds. The adjusted R^2 value is 4% for the full sample and ranges from 5% to 17% for the three liquidity sub-groups.

The coefficients for liquidity measure of the three liquidity groups are all significant and positive, which implies that dividend payment decisions are responsive to the availability of internal cash flow⁶⁹. Moreover, dividend payouts of the LC firms are significantly more responsive to liquidity than the SC firms. However, the PC firms show less responsiveness to liquidity than the SC firms. The estimated liquidity coefficients for the LC, SC, and PC groups are 15.268, 1.930, and 0.139, respectively. The observed differences⁷⁰ between the LC

⁶⁹ Panel data that relies on cross-sectional data, such as those used in the present study, usually violates the assumption of heteroscedasticity. Hence, tests such as the Chow test, which requires same variance of the disturbance terms for both regressions, are unlikely to be satisfied when using panel data.

⁷⁰ The empirical *p*-value is determined using the Output Management System ("OMS") macro for bootstrapping, as detailed in Appendix F. The sample is assigned random groups of three and regression is run and the difference

coefficient and the SC are significant at *p-value* of 0.009 while the observed differences between LC and PC groups are significant at *p-value* of 0.004. However, the observed differences between the PC and the SC groups are not significant. It is interesting to note that both Kaplan and Zingales (1997) and Cleary (1999) concluded that investment outlays of LC firms are significantly more sensitive to liquidity than the SC firms. Empirically, dividend payout decisions of LC firms under the present study are significantly more sensitive to liquidity than SC firms because dividend payments, like investment outlays, tends to depend on internal funds. Liquidity therefore influences dividend payout decisions of firms in the Canadian market.

It is conceivable that companies with negative liquidity may behave differently from those with positive cash flow as far as their use of dividends and share repurchases is concerned. To ensure that the foregoing results have not been clouded by the effects of negative cash flows and zero cash flows, table 34 below shows regression estimates using only firms with positive cash flow/EBEX. The results in table 34 are consistent with table 33 with very insignificant variation. Table 35 also displays year-by-year regression results using the full sample. It is important to note that while the coefficient estimate of market-to-book ratio is negative for each of the years from 1987 to 2001, only two of the years are statistically significant. On the contrary, the coefficients of the liquidity measure are positive and significant throughout the sample period except 1998. Hence, dividend payouts by all firms in the sample are not only significantly sensitive to liquidity on a cross-sectional basis but also on a time-series basis.

between the simulated beta of group 1 and group 2, for example, is compared with the observed difference in beta between group 1 and group 2. This process is repeated 1,000 times. The *p-value* based on a one-tailed test is the

Table 33: Regression results for dividend-cash flow sensitivities - raw data

The reported estimates are for the 1987-2001 sample period. Dividend payout expenditure dividend by Earnings before extraordinary expenditures ("EBEX") is the dependent variable. The market-to-book ratio and the cash flow/ EBEX are the independent variables. The market-to-book ratio is used to capture any investment opportunity effects since dividend payments involve the use of liquid resources which directly impact the ability of the firm to finance investment from internal resources and, depending on the nature of information asymmetry, may affect the ability of the firm to secure external resources to finance the available investment opportunity. The LC, PC and SC groups are formed based on the mean rank liquidity index. Each year, firms with the lowest mean rank liquidity index (bottom one-third) are classified as LC and those with the highest mean rank liquidity index (top one-third) are classified as SC while the middle one-third are classified as PC. The empirical p-values are estimated using a simulation process described in the study.

	Market-to-Book	t-statistics	Cash Flow/ EBEX	t-statistics	Adjusted R ²	Number of Observations
<i>Regression estimates</i>						
Total Sample	-0.068	-2.469	0.150	11.075	4%	3493
LC firms (least constrained)	-0.049	-0.574	15.268	20.271	17%	2011
PC firms (partially constrained)	-0.081	-1.356	0.139	7.968	5%	1217
SC firms (severely constrained)	-0.074	-1.714	1.930	6.618	15%	265 ⁷¹
<i>Empirical p-values</i>						
LC versus SC	0.0130		0.0090			
LC versus PC	0.0010		0.0040			
PC versus SC	0.7790		0.7810			

Table 34: Regression results for dividend-cash flow sensitivities - excluding negative and zero cash flows

	Market-to-Book	t-statistics	Cash Flow/EBEX	t-statistics	Adjusted R ²	Number of Observations
<i>Regression estimates</i>						
Total Sample	-0.068	-2.482	0.150	11.035	4%	3469
LC firms (least constrained)	-0.049	-0.573	15.267	20.243	17%	2009
PC firms (partially constrained)	-0.082	-1.367	0.138	7.927	5%	1205
SC firms (severely constrained)	-0.077	-1.753	1.909	6.429	15%	255
<i>Empirical p-values</i>						
LC versus SC	0.0130		0.0130			
LC versus PC	0.0030		0.0050			
PC versus SC	0.7540		0.7720			

⁷¹ The reason for the small sample size of the Severely Constrained ("SC") group compared to the LC and PC groups is that most of the SC firms did not pay dividends, thus diminishing the size of valid cases for regression purposes.

Table 35: Regression results for dividend-cash flow sensitivities – total sample raw data

Years	Market-to-Book	t-statistics	Cash Flow/ EBEX	t-statistics	Adjusted R ²	Number of Observations
1987	-0.056	-1.800	41.048	16.371	62%	167
1988	-0.031	-0.288	1.748	8.858	30%	179
1989	-0.066	-0.478	2.204	7.712	23%	198
1990	-0.053	-1.047	15.892	14.344	50%	209
1991	-0.088	-1.416	6.351	10.435	36%	201
1992	-0.071	-0.587	10.150	8.666	27%	197
1993	-0.074	-0.591	0.103	7.565	19%	232
1994	-5.845	-1.061	12.028	9.070	24%	259
1995	-0.043	-0.455	1.033	2.601	2%	272
1996	-1.889	-0.500	0.313	8.779	21%	288
1997	-0.049	-0.589	6.405	4.845	7%	288
1998	-0.066	-0.517	0.052	0.457	-1%	250
1999	-3.865	-0.844	16.252	4.362	7%	260
2000	-0.013	-0.123	12.788	7.115	16%	260
2001	-0.084	-0.567	1.523	7.019	17%	233

4.6.4 Discussion of share repurchase-liquidity constraint sensitivity regression results

Jagannathan, Stephens and Weisbach (2000) hypothesized that dividends represent an ongoing commitment and are used to distribute permanent cash flows, while repurchases are used to pay out cash flows that are potentially temporary. The results of their study confirmed their assertion. Moreover, empirical evidence also suggest that dividend payments decisions tend to be long term in nature while share repurchases tend to be short term decisions used to preserve financial flexibility. The implication of the foregoing discussion is that using cash flow/EBEX as a proxy measure of liquidity for the purpose of testing the relationship between share repurchase expenditure and liquidity may be inappropriate, because cash flow/EBEX is a closer proxy to long-term liquidity than short-term liquidity. Hence, current ratio is proposed as the liquidity measure for testing the sensitivity of share repurchase to liquidity given that current ratio is an acceptable short-term liquidity measure.

As expected, table 36 below shows that the relationship between share-repurchase expenditure and cash flow/EBEX or Market-to-Book ratio are not statistically significant. However, when the measure of liquidity is changed from cash flow/EBEX to Current Ratio, statistically significant results are observed as shown in table 37 below. For the total sample, there is a significant and negative relationship between Market-to-Book ratio and share repurchase expenditures with coefficient estimate of -0.029 and t-statistic of -1.496. Moreover, there is a positive and significant relationship between share repurchase expenditure and liquidity measured by current ratio with coefficient estimate of 1.322 and t-statistic of 2.423. However, with respect to the three groups of liquidity constraint, only the LC group shows a significant relationship between

liquidity and share repurchase expenditure, while the relationship between liquidity and share repurchase expenditures for the PC and the SC groups are statistically insignificant.

The foregoing results provide a further confirmation that share repurchase activity in Canada is also sensitive to the short-term liquidity of the firm in question. Moreover, the share repurchase-liquidity constraint sensitivity is statistically significant for the Least Constrained Canadian firms.

Table 36: Regression Results for share repurchase-liquidity sensitivities using cash flow as liquidity - total sample

	Market-to-Book	t-statistics	Cash Flow/ EBEX	t-statistics	Adjusted R ²	Number of Observations
Regression estimates						
Total Sample	-0.039	-0.604	0.012	0.045	-0.04%	4495
LC firms (least constrained)	-0.019	-0.118	-0.012	-0.020	-0.12%	1676
PC firms (partially constrained)	-0.008	-0.191	0.005	0.079	-0.12%	1577
SC firms (severely constrained)	-0.071	-0.526	0.493	0.182	-0.14%	1242

Table 37: Regression Results for share repurchase-liquidity sensitivities using current ratio as liquidity - total sample

	Market-to-Book	t-statistics	Current Ratio ⁷²	t-statistics	Adjusted R ²	Number of Observations
Regression estimates						
Total Sample	-0.029	-1.496	1.322	2.423	0.17%	4002
LC firms (least constrained)	-3.054	-1.164	3.189	3.075	0.55%	1497
PC firms (partially constrained)	-0.009	-0.145	-0.385	-0.436	-0.13%	1384
SC firms (severely constrained)	-0.021	-1.288	0.197	0.253	-0.02%	1121

⁷² Current ratio is a better measure of short term liquidity than cash flow since share repurchase tends to be used as a short term financial flexibility.

In summary, this section of the study has empirically proven for the first time that liquidity plays an important role in the dividend payment decisions of firms in the capital market. Using the newly developed Mean Rank Liquidity Index to classify firms into three liquidity groups, it has been observed that there is a positive relationship between liquidity and dividend expenditure. This study has also determined that least constrained Canadian firms are more sensitive to liquidity when making dividend payment decisions than severely constrained Canadian firms, thus establishing an inverse relationship between the least constrained and severely constrained group as far as cash flow-dividend expenditure sensitivities are concerned.

Kaplan and Zingales (1997) and Cleary (1999) have provided empirical evidence to support the assertion that least constrained firms will tend to have greater cash flow-investment sensitivity than severely constrained firms. Although investments may be funded from internal or external resources, dividends are usually funded from internal resources. To the extent that managers rely on internal funds for investment purposes despite the availability of external funds, investment and dividend expenditures will tend to compete for the same scarce internal resources. Hence, it is conceivable that least constrained firms will have higher cash flow-dividend expenditure sensitivities compared to severely constrained firms.

It is, however, noted that although a positive relationship is established between share repurchase expenditures and current ratio as a measure of short-term liquidity, the relationship between cash flow and share repurchase expenditure is not statistically

significant. Moreover, there is no statistical significance for the respective groups of partial and severely constrained firms, although sensitivity of liquidity to share repurchase expenditure for the Least Constrained firms is statistically significant.

The high turnover of firms from one class of liquidity constraint to another, per the liquidity constraint index, is equally a consistent reflection of the volatility in the dividend payment behavior of firms with positive earnings. This study has demonstrated that the liquidity situation of Canadian firms change significantly from year to year. Moreover, this study has further documented that firms with positive earnings have experienced significant disappearance in dividends. To further buttress the foregoing observation, this study has also documented for the first time that dividend payment behavior of least constrained firms are significantly more sensitive to liquidity than severely constrained firms. It is additionally noted from this study that least constrained firms are predominantly firms with positive earnings. Hence, the liquidity constraint analysis has provided a credible alternative explanation of the disappearance of dividends in Canada⁷³. Fama and French (2001) attributed the decline in dividends to the changing characteristics of firms that never paid dividends and lower propensity to pay dividends. Grullon and Michaely (2002) attributed the dividend disappearance phenomenon to the substitution by share repurchase activity. They noted that established firms partially financed their share repurchases with potential dividend increases. This study has for the

⁷³ Although some of the variables used in determining the mean rank liquidity constraint measure may affect dividend decisions, it is important to emphasize that firms cannot be adequately classified into liquidity constraint without referring to a number of qualitative and quantitative variables. It is the collection of these variables that defines liquidity constraint, according to the literature, although it is conceivable that some of the variable may have some relationship with the dividend behavior. Constrained firms face a large wedge between the internal and external cost of funds, and it reflects their overall financial health, which cannot be effectively determined or measured by a single variable.

first time documented that the disappearance of dividends is partially explained by the changing liquidity situation of the firm as evidenced by the heavy turnover of firms with respect to their liquidity index values and the inverse relationship between the sensitivity of dividend payment behavior of firms and their liquidity constraint situation.

4.7 Domestic and Foreign Control

The objective of this segment of the analysis is to determine whether the country of control of the firm influences its dividend payment pattern. According to the Inter-corporate Ownership database, a firm is considered foreign-controlled if the majority of its voting rights is held in foreign countries, or is held by one or more Canadian corporations that are themselves foreign-controlled⁷⁴. To avoid dramatic swings in classification as a result of relative minor stock transactions, the country of control of an enterprise head is changed only when changes in ownership of the voting equity of the enterprise head are substantial or appear to alter the potential or effective control over the management of the company.

To accomplish the foregoing objective, the country of control is determined for each firm in each year using the Inter-corporate Ownership⁷⁵ database produced by Statistics Canada. Subsequently, a binary variable is created whereby firms with Canada as the country of control are assigned the value one (1), i.e., domestic controlled, and firms with country of control other than Canada are assigned the value zero (0), i.e., foreign controlled. To ensure adequate comparison between foreign controlled and domestic controlled firms, a separate analysis will be conducted using matching sample derived

⁷⁴ In the case of a multi-corporation enterprise, it is the enterprise head or parent that is considered first, and each subsidiary within the enterprise is assigned the same country of control as its enterprise parent. If the enterprise head is a Canadian-resident corporation, the country of control is ascribed to that country in which the majority of the voting rights are held by both individuals and corporations. In those cases where the holdings of over 50% of the voting rights are distributed among non-associated shareholders in two or more foreign countries, foreign-control is assigned to that foreign country with the largest block of voting equity. If the largest blocks are equal, then the country of control is assigned using an order of precedence.

⁷⁵ The Cd-Rom version of this database commences from 1998, although data for the period prior to this date is only found in hard copies. The hard copies available for the required period of this study are for 1987, 1992 and 1996.

from propensity score estimates of several independent variables as discussed in section 3.2.6 above.

4.7.1 Analysis of Domestic and Foreign Controlled firms

Table 38 below shows the breakdown of domestic controlled firms versus foreign controlled firms in the sample of Canadian listed and de-listed firms from 1987 to 2001.

Table 38: Sample classification of domestic and foreign controlled firms

Classification	1987	1992	1996	1998	1999	2000	2001
Domestic controlled - count	137	374	526	857	919	919	900
Foreign controlled - count	21	70	80	170	186	188	192
Total	158	444	606	1027	1105	1107	1092
Domestic controlled -percent	87%	84%	87%	83%	83%	83%	82%
Foreign controlled - percent	13%	16%	13%	17%	17%	17%	18%
Total	100%	100%	100%	100%	100%	100%	100%
Foreign controlled - U.S.A.	15	42	48	121	139	139	139
Percent of foreign controlled	71%	60%	60%	71%	75%	74%	72%
Percent of total sample	9%	9%	8%	12%	13%	13%	13%

On average, 84% of Canadian firms are domestic controlled while about 16% of the firms are foreign controlled. Moreover of the foreign controlled firms, about 71% have United States of America as the country of control. Firms with United States as the country of control represent on average 11% of the firms in the total sample, similar to the percentage of Canadian-based American firms in the Inter-corporate Ownership database. It is also observed in the sample that the country of control is relatively stable and does not change frequently from year to year.

Table 39 below displays the pattern of dividends and share repurchase expenditures over the identified sample period. In total dollar terms, domestic controlled firms pay more

dividends than foreign controlled firms simply because 84% of the sample firms are domestic controlled. However, when viewed in terms of average dividend paid per firms, foreign controlled firms pay more dividends (Cdn. \$26.52 million) than domestic controlled firms (Cdn. \$14.6 million). In fact, in each of the seven years examined, the mean dividend paid by foreign controlled firms exceeded the mean dividend paid by the domestic controlled firms. Consistent with the foregoing observation, the average dividend payout ratio for foreign controlled firms is 77.65% compared to 63.99% for domestic controlled firms. In terms of expenditure on share repurchase activities, the trend is reversed. Table 39 shows that domestic controlled firms spend on average Cdn. \$12.3 million per year on share repurchase activities compared to foreign controlled firms who spend Cdn. \$2.31 million per year.

A possible explanation of the above observation can be derived from the tax differential effect of dividends and capital gains between Canada and the U.S. given that U.S. and Canada are the predominate countries in the sample. The effective dividend tax in Canada tends to be higher than capital gains tax. Given this premise, it is conceivable that domestic controlled firms will tend to pay lower dividends on average than foreign controlled firms, and spend more funds on share repurchases than foreign controlled firms.

It is also observed that domestic controlled firms have average dividend yield of 1.77% compared to 1.32% for foreign controlled firms, the result being statistically different⁷⁶. In five of the seven periods of study, dividend yield of domestic firms exceeded foreign

controlled firms. Given that foreign controlled firms pay more dividends than domestic controlled firms, the lower dividend yield of foreign controlled firms is due primarily to the high stock prices of foreign controlled firms compared to domestic controlled firms as shown in figure 14 below. Over the sample period, the mean and median closing price of shares of foreign controlled Canadian firms exceeded the domestic controlled Canadian firms.

⁷⁶ Wilcoxon Sign Rank Test.

Table 39: Dividend and share repurchase trends for domestic-foreign controlled firms

Domestic	1987	1992	1996	1998	1999	2000	2001
Dividend paid (total) \$ Million	2,430	4,522	7,274	7,873	9,160	11,119	11,667
Dividend paid (Mean) \$ Million	17.7	12.1	13.8	11.5	12.7	16.0	18.1
Share Repurchase (total) \$ Millions	150	246	2,909	2,025	3,734	8,014	8,594
Share Repurchase (Mean) \$ Millions	4.7	4.2	15.6	5.4	7.5	16.0	19.8
Dividend payout (%) – Mean	50.98	88.06	55.61	64.32	64.26	56.25	68.42
Dividend Yield (%) – mean	2.14	2.00	1.61	0.99	1.22	2.55	1.86
Number of Observations	137	374	526	684	722	694	644

Foreign	1987	1992	1996	1998	1999	2000	2001
Dividend paid (total) \$ Million	3,902	1,676	1,249	2,086	1,939	2,266	1,918
Dividend paid (Mean) \$ Million	185.8	23.9	15.6	20.7	19.8	22.7	19.8
Share Repurchase (total) \$ Millions	44.08	0.19	31.89	96.63	153.01	201.58	91.12
Share Repurchase (Mean) \$ Millions	8.82	0.03	1.23	1.97	2.39	3.20	1.69
Dividend payout (%) – Mean	34.25	103.58	69.30	138.88	58.54	78.41	60.59
Dividend Yield (%) – mean	2.46	1.82	0.64	0.84	0.71	0.48	2.32
Number of Observations	21	70	80	101	98	100	97

Fig 14 Closing share prices for domestic and foreign controlled firms

Table 40 and figure 15 below display the trend of dividend payers and non-payers for domestic and foreign controlled Canadian firms. Consistent with the general observation of this study, the proportion of dividend payers have dwindled over the sample period from 1987 to 2001. In the case of domestic controlled firms, the proportion of dividend payers declined from 64.96% in 1987 to 28.57% in 2001, while the proportion of dividend payers for foreign controlled firms also declined from 80.95% in 1987 to 22.68% in 2001. Hence, it is concluded that the declining dividend phenomena is not simply a statistical aberration but it is also manifested in foreign and domestic controlled firms.

It is equally observed from figure 15 that the proportion of foreign controlled dividend paying firms is higher than domestic controlled firms during the period from 1987 until 1998. Thereafter, the proportion of domestic controlled dividend paying firms exceeds the foreign controlled firms.

Table 40: Dividend payers and non-payers trends for domestic and foreign controlled firms

Domestic	1987	1992	1996	1998	1999	2000	2001
Number of Payers	89	159	190	194	200	205	184
Number of Non-payers	48	215	336	490	522	489	460
Total	137	374	526	684	722	694	644
Proportion of Payers (%)	64.96	42.51	36.12	28.36	27.70	29.54	28.57
Proportion of Non-payers (%)	35.04	57.49	63.88	71.64	72.30	70.46	71.43

Foreign	1987	1992	1996	1998	1999	2000	2001
Number of Payers	17	36	31	28	27	22	22
Number of Non-payers	4	34	49	73	71	78	75
Total	21	70	80	101	98	100	97
Proportion of Payers (%)	80.95	51.43	38.75	27.72	27.55	22.00	22.68
Proportion of Non-payers (%)	19.05	48.57	61.25	72.28	72.45	78.00	77.32

Fig 15 Proportion of Domestic and Foreign Controlled Firms Paying Dividends

4.7.2 Analysis of Domestic and Foreign Controlled firms using matching sample

Table 41 displays the pattern of dividend and share repurchase expenditures over the identified period for domestic and foreign controlled matched firms. Total expenditure on dividends over the study period was Cdn. 411.031 billion by foreign controlled firms compared to Cdn. \$7.522 billion by domestic controlled firms. The mean dividend paid by foreign controlled firms was also Cdn. \$85.63 million compared to Cdn. \$18.27 million for domestic controlled firms. Mean dividend payout for foreign controlled firms was also 87.31% compared to Cdn. \$80.39 million for domestic controlled firms. Table 41 equally show that domestic controlled firms spent on average Cdn. \$14.64 million per year on share repurchase activity compared to the meager Cdn. \$1.69 million spent by foreign controlled firms. Moreover, domestic controlled firms earn on average 1.90% average dividend yield which is statistically different from the 1.06% average dividend yield earned by foreign controlled firms. The lower dividend yield of foreign controlled firms is due primarily to their high stock prices as demonstrated in figure 16 below, with respect to mean and median closing prices. The key conclusion from table 41 is that the findings are consistent with the un-matched sample.

Table 41: Dividend and share repurchase trends for matched domestic-foreign controlled firms

Domestic	1987	1992	1996	1998	1999	2000	2001
Dividend paid (total) \$ Million	223.47	363.35	315.78	1541.74	1392.52	2331.30	1354.08
Dividend paid (Mean) \$ Million	37.25	7.57	4.93	17.72	21.76	24.28	14.41
Share Repurchase (total) \$ Millions	0.00	203.35	5.65	410.59	638.99	496.46	768.80
Share Repurchase (Mean) \$ Millions	0.00	40.67	0.28	8.21	18.26	7.41	13.03
Dividend payout (%) - Mean	57.76	141.88	45.87	50.17	86.81	74.57	83.04
Dividend Yield (%) - mean	3.86	3.98	1.07	0.61	1.13	3.98	0.65
Number of Observations	6	48	64	87	64	96	94
Closing Price (Mean)	7.33	6.32	11.06	12.58	9.23	12.53	8.80
Closing Price (Median)	4.21	3.08	8.05	5.75	3.65	3.50	3.70
Foreign	1987	1992	1996	1998	1999	2000	2001
Dividend paid (total) \$ Million	3504.30	1017.90	1052.49	1726.03	357.75	1455.16	1917.82
Dividend paid (Mean) \$ Million	500.61	21.21	16.45	20.07	5.50	15.16	20.40
Share Repurchase (total) \$ Millions	0.00	0.15	25.82	95.25	22.16	187.97	79.01
Share Repurchase (Mean) \$ Millions	0.00	0.08	1.52	2.57	0.58	3.61	1.76
Dividend payout (%) - Mean	31.85	97.61	82.82	152.56	23.29	73.70	93.91
Dividend Yield (%) - mean	2.78	1.68	0.55	0.87	0.49	0.48	2.32
Number of Observations	7	48	64	86	65	96	94
Closing Price (Mean)	40.32	11.40	12.12	13.45	10.67	17.16	14.20
Closing Price (Median)	21.50	7.63	8.88	5.94	3.15	4.40	4.31

Fig 16 Closing Share Prices for Matched Domestic and Foreign Controlled Firms

Table 42 and figure 17 also show the trend of dividend payers and non-payers for matched domestic and foreign controlled Canadian firms. Consistent with the un-matched sample, the proportion of dividend payers for domestic controlled firms declined from 83.33% in 1987 to 27.66% in 2001, while the proportion of dividend payers for foreign controlled firms also declined from 100% in 1987 to 23.40% in 2001. The foregoing further confirms the previous conclusion that declining dividends are equally manifested in domestic and foreign controlled firms.

It is further observed from figure 17 that the proportion of foreign controlled dividend payers is greater than domestic controlled firms during the period from 1987 to 1996. From that point onwards, the proportion of domestic controlled dividend paying firms surpasses the foreign controlled firms. The foregoing observations further confirm the conclusions determined using un-matched sample of domestic and foreign controlled firms.

Table 42: Dividend payers and non-payers trend for matched domestic and foreign Canadian firms

Domestic - Matched	1987	1992	1996	1998	1999	2000	2001
Number of Payers	5	18	23	31	18	29	26
Number of Non-payers	1	30	41	56	46	67	68
Total	6	48	64	87	64	96	94
Proportion of Payers (%)	83.33	37.50	35.94	35.63	28.13	30.21	27.66
Proportion of Non-payers (%)	16.67	62.50	64.06	64.37	71.88	69.79	72.34

Foreign - Matched	1987	1992	1996	1998	1999	2000	2001
Number of Payers	7	25	22	25	15	20	22
Number of Non-payers	0	23	42	61	50	76	72
Total	7	48	64	86	65	96	94
Proportion of Payers (%)	100.00	52.08	34.38	29.07	23.08	20.83	23.40
Proportion of Non-payers (%)	0.00	47.92	65.63	70.93	76.92	79.17	76.60

**Fig 17 Proportion of Matched Domestic and Foreign Controlled
Dividend Paying Canadian Firms**

In conclusion, the main observation in the Canadian market is that foreign controlled firms pay more dividends on average than domestic controlled firm, whereas in terms of share repurchases, domestic controlled firms spend more than foreign controlled firms. Moreover, domestic controlled firms have higher dividend yield than foreign controlled firms because foreign controlled firms tend to have higher market price per share than domestic controlled Canadian firms. The foregoing conclusions are consistent across the matched and un-matched sample study and the results from both studies show similar dividend and share repurchase patterns.

On the basis of the results from the matched and un-matched samples, it can be stated that the Canadian observation is contrary to the documented findings of Liljeblom and Pasternack (2002). Liljeblom and Pasternack (2002) observed a significant positive relationship between foreign ownership and share repurchases and a negative relationship between foreign ownership and dividend payments. They concluded that foreign ownership is, perhaps, the single most important variable associated with share repurchases in Finland. While further studies are warranted in order to discover other factors that may explain the Canadian findings, it is evident from the literature that in the absence of a foreign investor tax credit on dividends, foreign controlled firms may have a greater propensity to pay a lower dividend and adopt share repurchases as the payout option. Moreover, where a foreign investor tax credit is available, the differential dividend tax credit between the foreign and the domestic countries in question may also affect the choices the firm will make in terms of adopting dividends or share repurchases as the payout option. It is therefore important to further investigate the role foreign

investor tax credit plays in the documented evidence that foreign controlled firms pay more dividends and spend less on share repurchases than Canadian controlled firms as well as the full economic rationale behind the observation..

4.8 Over-investing and under-investing analysis

From the empirical literature, the growth status of the firm affects its payout policy. The objective of this section is to investigate whether overinvesting firms (“Low Q”) have different dividend payment and share repurchase patterns than underinvesting firms (“High Q”). In section 4.3 the Market-to-Book ratio was used as a proxy for investment opportunity for the purpose of determining its marginal effect on dividends and share repurchase activity. In this section of the study, the characteristics of Low Q and High Q firms and their unique payout patterns will also be discussed. In addition, the relationship between Low Q and High Q firms and the decision to make a payout, as well as the size of the payout to be made, will also be investigated.

4.8.1 Characteristics of Low Q and High Q Canadian firms

Tobin’s Q ratio, defined as the ratio of market value of assets to the replacement cost of assets, has been commonly used as a measure of a firm’s investment opportunities. A low Q ratio indicates that a firm is overinvesting or, in other words, investing in negative net present value projects. In such a scenario, the sale of assets, the payment of dividends, or the repurchase of shares may lead to an increase in the value of the firm. High Q ratio, on the other hand, indicates that the firm is underinvesting. In the Finance literature, the Market-to-Book Ratio has been used as the most common proxy measure for Tobin’s Q, and is defined as the relationship between stock market price and book value. Erickson and Whited (2001)⁷⁷ assessed the measurement quality of the different proxies for Tobin’s Q and noted that even though the most common proxy for Tobin’s Q in the

⁷⁷ Timothy Erickson and Toni M. Whited (2001), “On the Information Content of Different Measures of Q”, Social Science Research Network (SSRN) Working Paper Series, August 2.

finance literature is the Market-to-Book Ratio, it explains only forty percent of the variation in average Q.

To determine the dividend payment patterns of Low Q and High Q Canadian firms, the sample of listed and delisted Canadian firms is segregated into Low Q and High Q using the Market-to-Book ratio. For each year- t period, firms with Market-to-Book Ratio less than one are classified as Low Q, while firms with Market-to-Book Ratio greater than one are classified as High Q. Panels A and B of Table 43 display some of the key characteristics of Low Q and High Q firms.

From table 43 Low Q Canadian firms tend to be relatively small-sized firms with average market value of Cdn. \$125.43 million, while High Q firms tend to be large-sized firms with average market value of Cdn. \$883.71 million. Low Q firms tend to have a low average leverage ratio of 0.25, while High Q firms tend to have a high average leverage ratio of 9.19. Low Q firms also tend to have relatively better average return on assets of -2.71%, while High Q firms tend to be less profitable with an average return on assets of -7.7%.

Figure 18 below shows that, with the exception of 1990 when the proportion of High Q and Low Q firms was almost fifty percent, the High Q firms have maintained an average proportion of 73% compared to 27% of Low Q firms during the period from 1987 to 2001. With respect to investment opportunities, the Canadian market shows that over the period from 1987 to 1990 there was a drastic decline of High Q firms from 77% to 54%,

while Low Q firms increased from 23% to 46%. From 1990 to 1997, the proportion of High Q firms increased from 54% to 82%, while the proportion of Low Q firms decreased from 46% to 18%. From 1997 to 2001, however, the proportion of High Q firms has decreased again from 82% to 67%, while the proportion of Low Q firms has increased from 18% to 33%. The changes in the proportion of firms who experienced underinvestment or overinvestment may be reflective of the changing market cycles of expansion and contraction over the sample period.

There are similarities between the characteristics of the High Q and Low Q Canadian firms and U.S. firms. According to Chung and Wright (1998)⁷⁸, the average debt ratio of Low Q U.S. firms for the period from 1983 to 1987 was 0.17 and significantly higher than the debt ratio of 0.15 for the High Q firms. Moreover, the market value of Low Q firms was smaller than High Q firms. Hence, in terms of size of the firms, the observation in the U.S. market is consistent with the observation on the Canadian market. However, in terms of the debt ratio, the observation in Canada is different from the U.S. because Low Q Canadian firms have lower debt ratio compared to High Q firms, while in the U.S. it is the Low Q firms who have higher debt ratio compared to the High Q firms.

4.8.2 Dividends and Share Repurchase trends

This section discusses the differences in the trends of dividend payments and share repurchases of High Q and Low Q Canadian firms. From Table 43 High Q Canadian firms tend to pay on average Cdn. \$20.02 million dividends per year over the fifteen

⁷⁸ Kee H. Chung and Peter Wright (1998), "Corporate Policy and Market value: A q-Theory Approach", Review of Quantitative Finance and Accounting 11, pages 289-306.

years from 1987 to 2001, while Low Q firms pay on average Cdn. \$ 4.03 million of dividends over the sample period. However, with respect to the proportion of net income paid out as dividends, High Q firms have lower dividend payout ratio of 62.29% compared to 85.67% for Low Q firms. This observation is not surprising because from the size-based analysis of this study, small-sized Canadian firms tend to have higher dividend payout ratios than large-sized firms and Low Q firms in the Canadian market tend to be small-sized firms. A Low Q value indicate that the firm is overinvesting i.e., investing in negative net present value projects and with fewer investment opportunities. In such a case the firm may be able to increase its value by selling-off assets and paying shareholders dividends or engaging in share repurchase. Since smaller firms tend to be Low Q and have fewer investment opportunities as a result of limited market presence, one way to enhance their firm value is to pay dividends or repurchase shares.

The higher payout ratio for Low Q firms supports the agency theory that high payouts reduce the resources under the managers' control and lessen the likelihood that they would undertake negative net present value projects. To further substantiate the foregoing observation, Nohel and Tarhan (1998) classified firms into low and high-Q firms and found that the operating performance gains of Low-Q firms were generated by their ability to significantly increase their asset utilization. Moreover, the conclusion that smaller firms have low Q and have higher dividend payout ratios is consistent with the view that high dividend payouts may subject the firm to frequent scrutiny by capital markets, thereby reducing agency costs.

In terms of dividend yields, Low Q firms have average yield of 1.74% over the period from 1987 to 2001, while High Q firms have average dividend yield of 1.39%. Given that Low Q firms pay lower total dividends on average, the higher dividend yields are mainly attributed to the lower average market price per share of the Low Q firms. Finally, High Q Canadian firms spend on average Cdn. \$7.93 million on share repurchases compared to Cdn. \$ 5.16 million for Low Q firms.

Grullon and Ikenberry (2000)⁷⁹ have argued that dividend payments, like share repurchases, are a means to get rid of excess capital and helps firms from over-investing. In addition, Easterbrook (1984) and Jensen (1986) have also argued that one way to limit the potential free cash flow problems is for firms to return cash to shareholders in the form of higher dividends or to increase stock repurchases⁸⁰. Therefore, reduction in dividends tends to enhance High Q firm's capacity to undertake attractive investment opportunities given that High Q firms tend to overpay dividends. Reduction in dividend payments creates more internal funds for use in new investment projects. On the other hand, increase in dividends by Low Q firms tends to reduce the extent of overinvestment in negative net present value projects as free cash flow is reduced given that Low Q firms tend to underpay dividends.

According to Chung and Wright (1998), the dividend payout ratio for Low Q publicly traded large U.S. manufacturing firms from 1983 to 1987 was 26.4% compared to 17.0%

⁷⁹ Gustavo Grullon and David L. Ikenberry (2000), "What do we Know about Stock Repurchases?", Bank of America, Journal of Applied Corporate Finance, Volume 13, Number 1, Spring.

for High Q firms. This observation is consistent with Canadian firms for the period from 1987 to 2001, although the payout ratios are generally higher in the Canadian data.

⁸⁰ Frank Easterbrook (1984), "Two Agency-Cost Explanations of Dividends," *American Economic Review*, volume 74, Issue 4, pages 650 to 659; Michel Jensen (1986), "Agency Costs of Free Cash Flow, Corporate Finance and Takeovers", *American Economic Review*, 76, Issue 2, pages 323 to 329.

Table 43 Panel A: Characteristics of over-investing Canadian firms

Over-Investing Q or M/B<1 or Low Q	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Dividend paid (Total) \$ Million	921.2	484.3	342.9	2,155.2	904.2	985.1	221.1	420.8	498.1	231.1	454.9	1,208.1	1,127.2	1,466.0	859.8
Dividend paid (Mean) \$ Million	13.5	4.2	2.7	8.8	4.0	4.3	1.6	2.3	2.3	1.2	2.3	3.5	3.4	4.0	2.4
Share Repurchase (Total) \$ Millions	19.3	21.6	89.2	111.1	105.8	38.9	268.5	264.5	273.2	253.6	30.3	599.6	1109.8	1835.8	1083.8
Share Repurchase (Mean) \$ Millions	1.8	1.4	6.4	4.0	3.9	1.6	14.9	8.5	5.5	5.2	0.5	3.6	5.5	8.4	6.1
Dividend payout (%) - Mean	50.60	55.30	97.51	104.39	129.00	128.94	67.36	84.38	60.35	67.29	84.09	104.46	77.54	70.08	103.69
Dividend Yield (%) - Mean	2.96	1.78	1.48	2.36	1.62	2.03	1.03	0.92	0.99	1.28	1.43	1.06	1.46	3.30	2.32
Debt Ratio - Mean	0.19	0.22	0.24	0.28	0.26	0.29	0.27	0.26	0.24	0.26	0.22	0.26	0.28	0.27	0.25
Market value (Mean) \$ Millions	253.40	103.74	88.47	171.72	106.21	128.81	71.10	108.22	100.06	76.87	107.60	140.92	143.35	168.25	112.69
Cash flow from operation (Mean) \$ Millions	11.96	18.18	17.07	38.38	17.99	28.28	9.49	27.16	21.86	13.73	13.88	19.12	25.61	43.70	16.46
Capital expenditure (Mean) \$ Millions	15.63	17.18	19.24	39.13	21.84	20.20	8.21	12.59	12.37	13.29	22.09	32.25	28.77	36.16	18.49
Return Asset (%) - Mean	2.69	0.01	-2.75	-6.22	-5.92	-3.40	0.23	1.60	2.12	-0.05	-3.96	-10.95	-4.28	-2.80	-7.03
Number of Observations	68	115	128	128	226	227	140	185	214	194	201	349	337	368	353

Table 43 Panel B: Characteristics of under-investing Canadian firms

Under-Investing Q or M/B>1 or High Q	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Dividend paid (Total) \$ Million	6,472.5	9,417.5	9,383.3	8,175.9	10,326.7	6,867.7	7,104.8	8,137.6	8,328.9	10,140.6	11,226.9	11,292.5	12,893.8	14,184.2	18,088.9
Dividend paid (Mean) \$ Million	29.2	40.8	32.2	28.6	26.3	14.6	10.7	11.6	12.1	11.6	12.0	13.9	15.0	17.7	24.2
Share Repurchase (Total) \$ Millions	251.1	176.2	202.7	206.0	44.4	304.4	530.0	345.0	1263.7	6220.8	5353.3	3374.8	3816.1	8705.1	7183.6
Share Repurchase (Mean) \$ Millions	6.1	3.6	3.6	3.8	0.8	4.0	4.0	2.0	5.7	19.7	14.4	8.1	7.0	17.6	18.4
Dividend payout (%) - Mean	42.72	60.73	62.87	64.92	103.33	78.32	72.68	63.11	49.51	64.30	61.13	61.44	62.62	53.53	78.12
Dividend Yield (%) - Mean	1.52	2.58	2.41	1.76	2.38	1.36	0.81	1.00	0.94	1.07	0.70	0.97	0.88	1.25	1.19
Debt Ratio - Mean	4.79	4.90	3.78	14.34	8.07	17.32	1.82	7.48	3.20	7.09	4.59	5.34	15.45	17.93	21.73
Market value (Mean) \$ Millions	931.96	1,127.65	944.28	869.16	752.45	555.29	499.59	508.96	602.04	662.57	766.12	894.34	1,244.92	1,614.74	1,281.56
Cash flow from operation (Mean) \$ Millions	137.82	168.09	139.29	139.30	103.73	84.01	56.15	65.23	81.58	71.88	76.08	82.37	98.65	138.36	115.39
Capital expenditure (Mean) \$ Millions	79.81	105.87	99.87	94.25	78.73	52.51	42.51	46.75	56.10	57.96	65.48	72.65	75.65	86.68	109.24
Return Asset (%) - Mean	3.85	0.52	-5.55	-10.74	-8.35	-10.67	-1.55	-5.82	-1.83	-3.97	-8.67	-10.11	-14.51	-11.62	-27.51
Number of Observations	222	231	291	128	392	471	665	700	691	878	934	813	860	801	749

Fig. 18 Proportion of Over-investing and Under-investing Canadian Firms using Market-toBook Ratio

4.8.3 Effects of High Q and Low Q on Payout Decisions.

This segment of the discussion focuses on the extent to which decisions to make payouts to shareholders either in the form of dividends or through share repurchases and the amount of funds expended are influenced by the investment opportunities available to the firm. Table 44 panel A to D show the results of a cross-sectional binary logistic regression between the decision to pay or not pay dividends and whether the firm in question is overinvesting or underinvesting, after controlling for size and leverage.

Panel A of table 44 shows that the likelihood to pay or not pay dividends is significant and negatively impacted by the under or Low Q status of the firms. High Q firms are likely to make a decision to pay less dividends, while Low Q firms are likely to make a decision to pay more dividends. This observation is consistent with agency cost theory because according to Lang and Litzenberg (1989) High Q firms are usually firms located in attractive industries with capable management. Hence, a reduction in dividend payments releases scarce but cheaper internal funds to undertake beneficial marginal investment projects leading to improvement in shareholder value. On the other hand, Low Q firms generally pay less dividends because most of the internal funds are deployed in largely negative net present value investment opportunities. Agency free cash flow hypothesis would therefore suggest that these firms can release more value to shareholders by paying the free cash flow to shareholders rather than investing it in unprofitable projects with the market likely reacting favorably to the increase in dividend payments.

Panel B of table 44 also shows the likelihood that a High Q or Low Q Canadian firm would repurchase or not repurchase shares, after controlling for size and leverage. The results indicate that Low Q firms are less likely to repurchase shares, while High Q firms are more likely to repurchase shares. This observation is consistent with Howe, He and Kao (1992) who note that Low Q firms who repurchase stock, instead of experiencing favorable returns, are viewed by the market as having value-reducing management with greater personal ownership percentage that is harder to displace.

Panel C and D of table 44 show the regression effect of Low Q or High Q status of the firm on the size of the dividend payment or share repurchase amount spent. While panels C and D show a negative relationship between the amounts of dividend paid, the amount of share repurchase expenditures made, and the nature of Low Q or High Q status of the firm, only the dividend payment sample shows a significant t-statistic effect. Nonetheless, with respect to the size of funds expended on either payout options, firms behave similarly. Low Q firms spend a larger amount on dividends and share repurchase activities, while High Q firms spend lesser amounts on dividends and share repurchase expenditures.

In conclusion, there are similarities between Low Q and High Q Canadian and U.S. firms. Low Q firms tend to be small firms, while High Q firms tend to be large firms. High Q Canadian firms also have a lower dividend payout ratio of 62.29% compared to 85.67% payout ratio for Low Q firms. The likelihood to pay or not pay dividends is significant and negatively affected by the under or Low Q status of the firms. In terms of the decision to repurchase or not repurchase shares, Low Q Canadian firms are less likely to repurchase

shares while High Q firms are more likely to repurchase shares. Finally, there is a negative relationship between the amounts of dividend actually paid, the amount of expenditure made on share repurchases, and the Low Q or High Q status of the firm.

Table 44 Panel A: The effects of overinvesting and underinvesting on dividend payment decisions

Variables in the Equation	B	S.E.	Wald	df	Sig.	Exp(B)
price to book (Prbv)	-0.003	0.0003458	56.765717	1	0.00000	0.997398
Natural log of market cap (lnmv)	0.600	0.0131874	2073.0649	1	0.00000	1.8229128
debt ratio (dera)	-0.002	0.003781	0.2757043	1	0.59953	0.9980167
Constant	-7.631	0.1561842	2387.2316	1	0.00000	0.0004852
Variable(s) entered on step 1: prbv, lnmv, dera.						

Table 44 Panel B: The effects of overinvesting and underinvesting on share repurchase decisions

Variables in the Equation	B	S.E.	Wald	df	Sig.	Exp(B)
price to book (Prbv)	0.0004366	0.0001568	7.756276	1	0.00535	1.0004367
Natural log of market cap (lnmv)	0.1368274	0.0146698	86.995806	1	0.00000	1.1466303
debt ratio (dera)	0.0002736	0.0003708	0.5444204	1	0.46061	1.0002737
Constant	-3.828898	0.174291	482.61156	1	0.00000	0.0217336
Variable(s) entered on step 1: prbv, lnmv, dera.						

Table 44: Panel C: The effects of overinvesting and underinvesting on the size of dividend payouts

Model	Unstandardized Coefficients		t-statistic	Significance
	B	Std. Error		
(Constant)	103.14769	14.749778	6.99	3.203E-12
price to book	-0.0958925	0.0336211	-2.85	0.0043679
Natural log of market cap	-2.931319	1.1774403	-2.49	0.0128358
debt ratio	15.213474	8.8485	1.72	0.0856428
Dependent Variable: dividend payout ratio				

Table 44 Panel D: The effects of overinvesting and underinvesting on the size of share repurchase expenditure

Model	Unstandardized Coefficients		t-statistic	Significance
	B	Std. Error		
(Constant)	172.60036	78.98163	2.19	0.0289167
price to book	-0.0611281	0.0700409	-0.87	0.3828469
Natural log of market cap	-13.218682	6.6557357	-1.99	0.0470875
debt ratio	-0.0577392	0.2077336	-0.28	0.781065
Dependent Variable: share repurchase expenditure/ebex				

4.9 The impact of capital gains tax changes on share repurchase activity

The objective of this segment of the analysis is to investigate whether there is any statistically significant effect of the increase in the capital gain inclusion rate on the pattern of share repurchases activities in the Canadian market. Based on the review of capital gains and dividend tax policy pronouncements in Canada, as outlined in the literature section of this study, it became apparent that over the period from 1988 to 2000, the capital gains inclusion rate increased from 50% to 75%. Higher inclusion rate implies higher capital gains tax, which has a tendency to create disincentiveness to repurchase shares, all things being equal. However, it is equally important to recognize that to the extent that the differential tax between dividends and capital gains is very minimal, any announcement effect of the increase in the capital gain inclusion rate may be effectively eroded.

Our hypothesis is that share repurchase activity during the period of increase in capital gains inclusion rate will be lower than the period before the increase. Given that the 25% increase in the inclusion rate from 50% to 75% took effect in 1988 and remained unchanged until 2000 before declining to 66.67%, it presents a technical difficulty considering that the sample period for the study commences from 1987 and ends at 2001. Moreover, during the period from 1988 to 2000, the rate of dividend tax credit declined from 33.33% to 25%. From the foregoing, the effective capital gains tax remained at about 31% over the period from 1988 to 2000 compared to the effective dividend tax of 25%. The average differential tax over the period of about 6% is therefore too small to have a meaningful effect on share repurchases activity.

Table 45 displays the effects of capital gains inclusion rate changes on several measures of share repurchase activity. To assess the effect of the change in tax policy, we divide the sample into two sub-periods, namely, pre and post. We test the null hypothesis that share repurchase activity is similar over the two sub-periods using the Wald statistic. The results from Panel E of table 45 indicate that the mean share repurchase measures actually increased during the period when the increase of the capital gains inclusion rate was in effect, contrary to the hypothesis. Besides, the Wald statistic is also not significant. Although the negative difference in some of the measures in Panels A and B might indicate, among other reasons, that share repurchase activity declined, the difference is, however, not statistically significant. The low effective differential tax rate between dividends and capital gains may imply that the tax policy changes did not play a key role in the decision to use share repurchases instead of dividends as a payout method.

To further explain the lack of statistical significance, figures 19 and 20 shows that during the sample period from 1987 to 2001, the average proportion of share repurchase expenditure as a ratio of total payout exceeded dividends as a ratio of total payout. Moreover, the average proportion of share repurchases expenditure as a ratio of market capitalization exceeded the ratio of dividends as a ratio of market capitalization over the sample period. Figures 19 and 20, coupled with the results in table 45, indicate that the differential tax rate between dividends and capital gains may not have played an important role in the share repurchase expenditure decisions by firms within the sample.

In summary, the increase in the capital gains inclusion rate during the period from 1988 to 2000 did not statistically impact the share expenditure activity of the firms within the sample. Part of the explanation may be the relatively small effective differential tax between dividends and capital gains over the sample period under study.

Table 45: Effect of capital gain inclusion rate on share repurchase activity

Panel A	Entire Sample 1987-2001	Pre-Change 1987	Post-Change 1988	Difference Post-Pre	Wald Test Statistic
Means					
REPURCHASE/DIVIDEND	5.81	0.21	0.07	-0.14	0.01
REPURCHASE/PAY	0.27	0.06	0.11	0.05	0.02
REPURCHASE/MV	0.31	0.09	0.17	0.08	0.00
REPURCHASE/EBEX	11.89	0.34	5.58	5.24	0.01
Panel B	Entire Sample 1987-2001	Pre-Change 1987	Post-Change 1989	Difference Post-Pre	Wald Test Statistic
Means					
REPURCHASE/DIVIDEND	5.81	0.21	0.02	-0.19	0.01
REPURCHASE/PAY	0.27	0.06	0.08	0.02	0.00
REPURCHASE/MV	0.31	0.09	0.24	0.15	0.01
REPURCHASE/EBEX	11.89	0.34	-1.69	-2.04	0.00
Panel C	Entire Sample 1987-2001	Pre-Change 1999	Post-Change 2000	Difference Post-Pre	Wald Test Statistic
Means					
REPURCHASE/DIVIDEND	5.81	1.40	0.28	-1.12	0.00
REPURCHASE/PAY	0.27	0.45	0.35	-0.10	0.02
REPURCHASE/MV	0.31	0.22	0.66	0.44	0.00
REPURCHASE/EBEX	11.89	66.20	5.39	-60.81	0.00
Panel D	Entire Sample 1987-2001	Pre-Change 2000	Post-Change 2001	Difference Post-Pre	Wald Test Statistic
Means					
REPURCHASE/DIVIDEND	5.81	0.92	0.28	-0.64	0.01
REPURCHASE/PAY	0.27	0.46	0.35	-0.11	0.03
REPURCHASE/MV	0.31	0.38	0.66	0.28	0.00
REPURCHASE/EBEX	11.89	13.91	5.39	-8.52	0.00
Panel E	Entire Sample 1987-2001	Pre-Change 1987-1988	Post-Change 1989-1999	Difference Post-Pre	Wald Test Statistic
Means					
REPURCHASE/DIVIDEND	5.81	0.14	7.66	7.52	0.00
REPURCHASE/PAY	0.27	0.09	0.25	0.16	0.10
REPURCHASE/MV	0.31	0.13	0.26	0.13	0.00
REPURCHASE/EBEX	11.89	3.02	13.12	10.10	0.00

Fig. 19 Dividend and Share Repurchase as a proportion of Total Payout

Fig 20 Dividend and Share Repurchase as a proportion of Market Value

4.10 Multiple regression results

This section of the study is devoted to investigating the multivariate impact of the key variables discussed in this study on dividend patterns and share repurchase activities. There are basically three major response variables used in this study namely, dividend payout ratio, dividend yield and share repurchase to earnings ratio. There are also several key predictor variables employed in this study. Some of the variables are performance-based, others are valuation-based and the remaining variables are characteristics-based. The key performance-based variables are Liquidity, Net Profit Ratio, and Return on Assets. The key valuation-based variables are Price-to-Book Ratio and Closing Market Price of share. Finally, the key variables that are based on the characteristics of the firms and which do not change very much from year-to-year are dual class structure, domestic-foreign control and the size of the firm. The use of multiple regression modeling enables us to discuss the joint effect of the predictor variables on any of the key response variables outlined above. In addition, to eliminate the effects of censoring in the data, a Tobit analysis will be conducted to determine the effects of the selected variables on payout ratios of dividend paying Canadian firms.

4.10.1 Multiple regression results without excluding non-dividend paying firms

Table 46 and figure 21 show the multiple regression results of several key variables on dividend payout ratio for the entire sample, and the Normal P-P Plot of the regression standardized residuals. The estimated R^2 Adjusted of 7.2% appears reasonable and is typical of cross-sectional studies which tend to have low R^2 . The F-statistic of 14.8 is also significant at 0.000 level. Moreover, figure 21 shows that the residuals are normally

distributed. From table 46 all the key variables have statistically significant impact on dividend payout ratio except the effect of dual-class structure which is statistically insignificant. It is also important to note that Liquidity has the largest significant t-statistic of 8.863 and a positive standardized beta of 0.243 on dividend payout ratio, which is a further confirmation of how sensitive dividend payment decisions are to the liquidity of the firm.

Table 47 and figure 22 show the impact of the regression variables on dividend yield for the entire sample, and the Normal P-P Plot of the regression standardized residuals. It is important to note that the residuals in figure 22 are not normally distributed. In addition, the R^2 Adjusted is just 1% which implies that the selected predictor variables provide little help in explaining the variation in dividend yield. It is also important to note that only Net Profit Ratio and Return on Assets from the performance-based predictor variables are statistically significant, although their impact on dividend yield are very insignificant. It is also important to emphasize that Liquidity does not have any statistically significant impact on dividend yield. The other remaining variable with statistically significant impact on dividend yield is the type of share class structure of the firm.

Table 48 and figure 23 on the other hand shows the effect of the performance, valuation and characteristic-based variables on share repurchase expenditures as well as the Normal P-P Plot of the regression standardized residuals. Figure 23 shows that the residuals are not normally distributed. It is also important to note that Liquidity is not statistically

significant. However, when Current Ratio, a short-term liquidity measure, is used, a t-statistic of 2.753 is achieved at a significance level of 0.006 with a positive effect on share repurchase expenditure decisions based on standardized beta of 0.065. In addition, the only other statistically significant and negative effect on share repurchase expenditure is Size with a standardized beta of -0.051 and a t-statistic of -1.6748 at a significance level of 0.0941.

Table 46: Factors affecting dividend payout decisions based on a multivariate analysis using the entire sample

Predictor Variables	Dependent Variable
cash flow(EBEX+DEpreciation)/ebex	dividend payout ratio
net profit ratio	
return on assets	
dual class=1 single-class=0	
domestic=1;foreign=2	
Natural log of market cap	
closing prices	

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.279	0.078	0.072	128.038

ANOVA	Sum of Squares	df	Mean Square	F	Sig.
Regression	1700380.940	7.000	242911.563	14.817	0.000
Residual	20180534.874	1231.000	16393.611		
Total	21880915.814	1238.000			

Coefficients	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	97.962	29.054		3.372	0.001
cash flow(EBEX+DEpreciation)/ebex	0.340	0.038	0.243	8.863	0.000
net profit ratio	0.224	0.085	0.075	2.632	0.009
return on assets	-0.664	0.348	-0.055	-1.908	0.057
dual class=1 single-class=0	-4.867	8.226	-0.017	-0.592	0.554
domestic=1;foreign=2	29.373	11.215	0.073	2.619	0.009
Natural log of market cap	-4.422	2.079	-0.066	-2.127	0.034
closing prices	-0.293	0.207	-0.044	-1.416	0.157

Table 47: Factors affecting dividend yield based on a multivariate analysis using the entire sample

Predictor Variables	Dependent Variable
net profit ratio	dividend yield
return on assets	
dual class=1 single-class=0	
domestic=1;foreign=2	
Natural log of market cap	
closing prices	
cash flow(EBEX+Depreciation)/ebex	

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.110	0.012	0.010	9.434

ANOVA	Sum of Squares	df	Mean Square	F	Sig.
Regression	4447.511	7.000	635.359	7.139	0.000
Residual	363138.123	4080.000	89.004		
Total	367585.634	4087.000			

Coefficients	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.405	1.010		2.382	0.017
net profit ratio	0.003	0.001	0.067	3.837	0.000
return on assets	0.009	0.003	0.044	2.499	0.012
dual class=1 single-class=0	1.328	0.408	0.051	3.254	0.001
domestic=1;foreign=2	-0.229	0.446	-0.008	-0.513	0.608
Natural log of market cap	-0.054	0.079	-0.012	-0.678	0.498
closing prices	0.000	0.007	-0.001	-0.064	0.949
cash flow(EBEX+Depreciation)/ebex	0.000	0.003	-0.002	-0.145	0.885

Table 48: Factors affecting share repurchase decisions based on a multivariate analysis using the entire sample

Predictor Variables	Dependent Variable
net profit ratio	share repurchase expenditure/ebex
return on assets	
dual class=1 single-class=0	
domestic=1;foreign=2	
Natural log of market cap	
closing prices	
current ratio	
cash flow(EBEX+DEpreciation)/ebex	

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.079	0.006	0.002	334.384

ANOVA	Sum of Squares	df	Mean Square	F	Sig.
Regression	1297260.443	8.000	162157.555	1.450	0.171
Residual	208418459.835	1864.000	111812.478		
Total	209715720.279	1872.000			

Coefficients	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	111.647	65.994		1.692	0.091
net profit ratio	0.032	0.045	0.019	0.712	0.477
return on assets	0.164	0.278	0.016	0.589	0.556
dual class=1 single-class=0	-6.241	21.009	-0.007	-0.297	0.766
domestic=1;foreign=2	-9.440	24.421	-0.009	-0.387	0.699
Natural log of market cap	-8.813	5.264	-0.051	-1.674	0.094
closing prices	0.375	0.609	0.019	0.615	0.538
current ratio	3.233	1.174	0.065	2.753	0.006
cash flow(EBEX+Depreciation)/ebex	0.064	0.312	0.005	0.205	0.837

Figure 21: Normal P-P Plot of dividend payout ratio for the entire sample

Figure 22: Normal P-P Plot of dividend yield for the entire sample

Figure 23: Normal P-P Plot of share repurchases for the entire sample

4.10.2 A multivariate time series results using the entire sample

Table 49 Panels A to E display a time series multivariate regression results of the effects of the performance-based, valuation-based and characteristic-based predictors variables on dividend payout ratio for the entire sample of listed and delisted Canadian firms. Over the fifteen year period, the lowest R^2 Adjusted is 3% in 1995 and the highest is 72% in 1987. The lowest F-statistic is 2.314 with a 0.028 level of significance for 1998, and the highest F-statistic is 36.654 with a 0.000 level of significance for 1987. Based on the F-statistics and the R^2 Adjusted, the time series results appear to be robust.

Several major observations can be deduced from the time series analysis. Firstly, all the three performance-based predictors as well as the Size measure show a greater frequency of significance over the fifteen year period in explaining dividend payout ratio. Secondly, liquidity appears to be the key predictor in explaining dividend payout because in fourteen out of the fifteen-year period, liquidity demonstrates statistically significant effect on the size of dividend payments. Thirdly, the remaining predictor variables such as dual class structure, domestic-foreign control and market price play a less prominent role in explaining dividend payout ratio over the fifteen year period.

The conclusion that can be drawn from the above is that dividend payout decisions in Canada are not only explained in aggregate terms by the afore-mentioned variables noted in table 46, but in addition, these variable are also statistically significant in explaining dividend decisions by Canadian firms on a year-by-year basis during the study period.

Table 49 Panel A: Factors affecting dividend payout decision based on a multivariate time series analysis using the entire sample

	1987			1988			1989		
R ² Adjusted	0.720			0.290			0.224		
F-statistic	36.654 [*]			13.095 [*]			10.484 [*]		
	Unstandardized Beta	t-statistic	Significance	Unstandardized Beta	t-statistic	Significance	Unstandardized Beta	t-statistic	Significance
(Constant)	27.600	0.576	0.566	51.190	0.944	0.347	91.566	1.424	0.156
cash flow/net income(ebex+depreciation)/ebex	45.721	15.664	0.000	1.742	8.728	0.000	2.236	7.729	0.000
Net Profit ratio	0.346	1.047	0.298	0.054	0.602	0.548	0.121	0.878	0.381
Return on Assets	0.697	1.029	0.306	0.041	0.050	0.960	-0.891	-0.827	0.409
Dual Class (1) Single-class (0)	-30.665	-2.451	0.016	-15.926	-0.858	0.392	-33.299	-1.436	0.153
Domestic Control (1) Foreign Control (0)	-2.904	-0.183	0.855						
Natural Log of Market Capitalization	-4.898	-1.410	0.162	0.560	0.124	0.902	-1.243	-0.231	0.818
Stock Market Price -Close	-0.398	-0.726	0.470	-0.244	-0.426	0.670	-0.334	-0.475	0.636

Table 49 Panel B: Factors affecting dividend payout decision based on a multivariate time series analysis using the entire sample

	1990			1991			1992		
R ² Adjusted	0.483			0.391			0.293		
F-statistic	33.732 [*]			23.007 [*]			9.948 [*]		
	Unstandardized Beta	t-statistic	Significance	Unstandardized Beta	t-statistic	Significance	Unstandardized Beta	t-statistic	Significance
(Constant)	67.044	1.435	0.153	94.417	1.487	0.139	225.499	2.396	0.018
cash flow/net income(ebex+depreciation)/ebex	15.937	14.180	0.000	6.549	11.164	0.000	11.136	7.981	0.000
Net Profit ratio	0.025	0.250	0.803	0.095	0.395	0.693	-0.258	-0.929	0.354
Return on Assets	0.173	0.427	0.670	0.245	0.425	0.672	0.145	0.138	0.890
Dual Class (1) Single-class (0)	-19.971	-1.218	0.225	-9.896	-0.414	0.680	-29.205	-1.084	0.280
Domestic Control (1) Foreign Control (0)							-25.004	-0.833	0.406
Natural Log of Market Capitalization	-1.841	-0.463	0.644	-4.510	-0.836	0.404	-11.555	-1.619	0.108
Stock Market Price -Close	-0.303	-0.364	0.716	3.169	3.886	0.000	-0.073	-0.064	0.949

Table 49 Panel C: Factors affecting dividend payout decision based on a multivariate time series analysis using the entire sample

	1993			1994			1995		
R ² Adjusted	0.208			0.237			0.030		
F-statistic	11.394 [*]			14.559 [*]			2.412 [#]		
	Unstandardized Beta	t-statistic	Significance	Unstandardized Beta	t-statistic	Significance	Unstandardized Beta	t-statistic	Significance
(Constant)	-24.241	-0.393	0.694	65.942	1.155	0.249	39.417	0.973	0.331
cash flow/net income(ebex+depreciation)/ebex	0.102	7.557	0.000	12.141	9.008	0.000	0.996	2.522	0.012
Net Profit ratio	0.163	1.129	0.260	0.173	1.314	0.190	0.294	2.317	0.021
Return on Assets	-2.751	-2.097	0.037	-1.472	-1.135	0.257	-1.477	-1.931	0.055
Dual Class (1) Single-class (0)	20.916	1.142	0.255	14.113	0.780	0.436	13.546	1.039	0.300
Domestic Control (1) Foreign Control (0)									
Natural Log of Market Capitalization	7.602	1.509	0.133	-1.396	-0.299	0.766	1.387	0.411	0.681
Stock Market Price -Close	0.391	0.485	0.628	-0.859	-1.116	0.266	-0.478	-0.937	0.349

Table 49 Panel D: Factors affecting dividend payout decision based on a multivariate time series analysis using the entire sample

	1996			1997			1998		
R ² Adjusted	0.382			0.098			0.046		
F-statistic	18.924 [*]			6.246 [*]			2.314 [#]		
	Unstandardized Beta	t-statistic	Significance	Unstandardized Beta	t-statistic	Significance	Unstandardized Beta	t-statistic	Significance
(Constant)	107.720	2.238	0.026	41.618	0.829	0.408	316.825	3.816	0.000
cash flow/net income(ebex+depreciation)/ebex	0.312	10.413	0.000	6.265	4.757	0.000	0.049	0.411	0.682
Net Profit ratio	0.331	4.192	0.000	0.271	1.760	0.079	0.639	0.920	0.359
Return on Assets	-1.835	-1.521	0.130	-1.700	-1.830	0.068	-4.026	-2.215	0.028
Dual Class (1) Single-class (0)	-16.372	-1.101	0.272	42.497	2.875	0.004	-14.311	-0.618	0.537
Domestic Control (1) Foreign Control (0)	-28.736	-1.509	0.133				-101.627	-3.048	0.003
Natural Log of Market Capitalization	-1.393	-0.378	0.706	0.005	0.001	0.999	-10.237	-1.784	0.076
Stock Market Price -Close	-0.186	-0.419	0.676	-0.116	-0.295	0.768	-0.081	-0.160	0.873

Table 49 Panel E: Factors affecting dividend payout decision based on a multivariate time series analysis using the entire sample

	1999			2000			2001		
R ² Adjusted	0.078			0.204			0.187		
F-statistic	3.5 [*]			8.528 [*]			7.022 [*]		
	Unstandardized Beta	t-statistic	Significance	Unstandardized Beta	t-statistic	Significance	Unstandardized Beta	t-statistic	Significance
(Constant)	159.376	2.506	0.013	105.235	1.948	0.053	182.494	2.202	0.029
cash flow/net income(ebex+depreciation)/ebex	17.158	3.564	0.000	13.574	7.203	0.000	1.431	6.562	0.000
Net Profit ratio	0.184	0.530	0.597	1.039	2.086	0.038	0.559	1.312	0.191
Return on Assets	-2.202	-1.505	0.134	-0.395	-0.619	0.537	-0.180	-0.264	0.792
Dual Class (1) Single-class (0)	26.263	1.499	0.135	7.604	0.498	0.619	2.852	0.118	0.907
Domestic Control (1) Foreign Control (0)	-18.056	-0.679	0.498	-39.406	-1.671	0.096	-35.402	-1.001	0.318
Natural Log of Market Capitalization	-9.197	-2.026	0.044	-4.248	-1.113	0.267	-4.901	-0.806	0.421
Stock Market Price -Close	0.266	0.543	0.588	-0.107	-0.330	0.742	-0.872	-1.620	0.107

* 0.000 level of significance.

0.028 level of significance.

4.10.3 A multivariate regression results excluding non-dividend payers

Table 50 and figure 24 show the impact and the degree of significance of the factors that explain dividend payout ratio after excluding the non-dividend paying firms from the sample. The objective of this segment of the analysis is to determine if there are any significant changes in the result after excluding non-dividend paying firms from the sample. From Table 50, the R^2 Adjusted improves a bit from 7.2% in table 46 to 8.2% in table 50 while the F-statistic increases from 14.817 to 16.538. However, all the predictor variables maintain their statistical significance.

Table 51 and figure 25 also show the effects of the various predictor variables in explaining dividend yield after excluding non-dividend paying firms from the sample. There is a marked improvement in table 51 compared to table 47. Firstly, the R^2 Adjusted increases from 1% to 14.3% while the F-statistic increases from 7.139 to 33.345. Secondly, in addition to Net Profit Ratio, Return on Assets, and Dual-singles class structure maintaining their statistical significance as in table 47, two other variables namely Size and Market Price also show statistical significance in explaining dividend yield. Thirdly, the magnitude of the impact of the predictor variables on dividend yield is much higher when the sample excludes non-dividend payers than when the total sample is considered. Fourthly, the residuals in figure 25 are normally distributed although skewed to the right side of the distribution.

Finally, table 52 and figure 26 show the multivariate results of the factors that explain share repurchase expenditure. The results in table 52 are not robust given that the R^2

Adjusted is -0.4% and the F-statistic is 0.670. In table 52, only the Dual class structure has a significant effect on share repurchase expenditures however, all the remaining predictor variables are statistically insignificant.

Table 50: Factors affecting dividend payout decisions based on a multivariate analysis excluding non-dividend payers

Predictor Variables	Dependent Variable
cash flow(EBEX+Depreciation)/ebex	dividend payout ratio
net profit ratio	
return on assets	
dual class=1 single-class=0	
domestic=1;foreign=2	
Natural log of market cap	
closing prices	

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.295	0.087	0.082	128.124

ANOVA	Sum of Squares	df	Mean Square	F	Sig.
Regression	1900391.663	7.000	271484.523	16.538	0.000
Residual	19879429.853	1211.000	16415.714		
Total	21779821.516	1218.000			

Coefficients	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	119.939	29.843		4.019	0.000
cash flow(EBEX+Depreciation)/EBEX	0.215	0.024	0.249	9.065	0.000
net profit ratio	0.235	0.091	0.074	2.591	0.010
return on assets	-1.291	0.426	-0.088	-3.031	0.002
dual class=1 single-class=0	-5.601	8.297	-0.019	-0.675	0.500
domestic=1;foreign=2	30.182	11.328	0.075	2.664	0.008
Natural log of market cap	-5.756	2.127	-0.085	-2.706	0.007
closing prices	-0.273	0.204	-0.042	-1.333	0.183

Table 51: Factors affecting dividend yield based on a multivariate analysis excluding non-dividend payers

Predictor Variables	Dependent Variable
net profit ratio	dividend yield
return on assets	
dual class=1 single-class=0	
domestic=1;foreign=2	
Natural log of market cap	
closing prices	
cash flow(EBEX+Depreciation)/cbcx	

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.384	0.148	0.143	14.837

ANOVA	Sum of Squares	df	Mean Square	F	Sig.
Regression	51380.635	7.000	7340.091	33.345	0.000
Residual	296729.829	1348.000	220.126		
Total	348110.464	1355.000			

Coefficients	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	20.116	3.254		6.181	0.000
net profit ratio	0.055	0.008	0.194	7.353	0.000
return on assets	0.327	0.039	0.221	8.313	0.000
dual class=1 single-class=0	-1.536	0.910	-0.044	-1.687	0.092
domestic=1;foreign=2	-0.350	1.249	-0.007	-0.280	0.779
Natural log of market cap	-1.236	0.235	-0.152	-5.252	0.000
closing prices	-0.039	0.023	-0.048	-1.673	0.095
cash flow(EBEX+Depreciation)/cbcx	-0.001	0.003	-0.007	-0.276	0.782

Table 52: Factors affecting share repurchase decisions based on a multivariate analysis excluding non-dividend payers

Predictor Variables	Dependent Variable
net profit ratio	share repurchase expenditure/ebex
return on assets	
dual class=1 single-class=0	
domestic=1;foreign=2	
Natural log of market cap	
closing prices	
current ratio	
cash flow(EBEX+Depreciation)/ebex	

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.095	0.009	-0.004	3.235

ANOVA	Sum of Squares	df	Mean Square	F	Sig.
Regression	56.075	8.000	7.009	0.670	0.718
Residual	6173.404	590.000	10.463		
Total	6229.478	598.000			

Coefficients	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.351	1.265		0.277	0.781
net profit ratio	0.002	0.007	0.016	0.294	0.769
return on assets	-0.003	0.017	-0.012	-0.208	0.835
dual class=1 single-class=0	0.566	0.288	0.084	1.963	0.050
domestic=1;foreign=2	-0.018	0.458	-0.002	-0.039	0.969
Natural log of market cap	-0.013	0.091	-0.007	-0.138	0.890
closing prices	-0.004	0.010	-0.022	-0.405	0.686
current ratio	-0.002	0.021	-0.005	-0.110	0.913
cash flow(EBEX+Depreciation)/ebex	0.000	0.003	0.007	0.180	0.857

Figure 24: Normal P-P Plot for dividend payout ratio excluding non-dividend payers

Figure 25: Normal P-P Plot for dividend yield excluding non-dividend payers

Figure 26: Normal P-P Plot for share repurchases excluding non-dividend payers

4.10.4 Tobit Analysis

To eliminate the possible effect of censoring on the analysis involving the factors affecting dividend payouts of dividend paying firms, the Tobit analysis is used. The classic Tobit analysis discussed in Tobin (1958) and was based on a regression model for left censored data assuming a normally distributed error term. Censoring occurs when the data set has value of zero for the response variable, as in the case of firms that do not use dividends, especially when analyzing the factors that influence dividend payouts in dividend paying firms. The PROC LIFEREG Procedure in SAS is used to perform a Tobit analysis and it estimates the parameters of the distribution of the uncensored data. A More complete discussion of censored normal data and related distributions can be found in Maddala (1983) and Greene (1993).

Table 53 below displays the output of the SAS LIFEREG Procedure of the effects of several predictor variables on dividend payout ratio of dividend paying firms, based on normal and log normal distributions. Both models converge with strong goodness-of-fit. The non-dividend paying firms are censored from the data using left censoring⁸¹. From Table 53 Panel A, liquidity (cfoe) maintains its significance at a *p-value* of <.0001 with a

⁸¹ The SAS LIFEREG Process for running Tobit analysis with left censoring and based on normal distribution is as shown.

```
proc import datafile = 'c:\documents and settings\samuel\my documents\analysis
file\tobitanalysis.txt' out=work.xyz;
getnames=yes; run;
data work.xyz;
set work.xyz;
if divpay eq 0
then Lower=.;
else Lower=divpay;
proc lifereg data=work.xyz outest=OUTEST(keep=_scale_);
class dlsg contrl;
Model (Lower, divpay) =roye cfoe contrl lnmv dlsg nepr cprice/d=normal; run;
```

positive impact of 0.2022. Foreign control (contrl 0) has a positive effect on dividend payout ratios with an estimated effect of 27.92 and a *p-value* of 0.0141. Net profit ratio also shows a positive impact on dividend payout ratio with an estimated effect of 0.2486 and *p-value* of 0.0046. From Panel B of Table 53, the variable that have statistically significant effect on dividend payout are return on assets, liquidity, single class firms and closing prices of the stock.

From the foregoing discussion of the Tobit analysis, liquidity still remains the most statistically significant variable that explains dividend payout ratios in Canadian firms. However, whereas there are other variables such as foreign control and net profit ratio that have a higher impact on payout ratios, their significance in the payout decision process are less important.

Table 53: Tobit analysis of the factors influencing dividend payouts

Panel A: Tobit analysis based on normal distribution with censoring for firms that did not pay dividends							
Parameter	Df	Estimate	Standard Error	95% Confidence Limits		Chi-Squared	Pr> ChiSq (P-Value)
Intercept	1	107.2639	26.291	55.7345	158.7934	16.65	<.0001
rove	1	-0.468	0.3656	-1.1845	0.2485	1.64	0.2004
cfoe	1	0.2022	0.0234	0.1564	0.248	74.79	<.0001
contrl 0	1	27.9215	11.3775	5.6221	50.2209	6.02	0.0141
contrl 1	0	0	0	0	0	.	.
lnmv	1	-3.429	2.1142	-7.5728	0.7147	2.63	0.1048
dslg 0	1	4.0145	8.3396	-12.3308	20.3598	0.23	0.6302
dslg 1	0	0	0	0	0	.	.
nepr	1	0.2486	0.0878	0.0765	0.4208	8.01	0.0046
cprice	1	-0.271	0.2065	-0.6757	0.1338	1.72	0.1895
scale	1	129.5175	2.6352	124.4542	134.7868		
Panel B: Tobit analysis based on lognormal distribution with censoring for firms that did not pay dividends							
Parameter	DF	Estimate	Standard Error	95% Confidence Limits		Chi-Squared	Pr> ChiSq (P-Value)
Intercept	1	3.967	0.0086	3.5189	4.4151	301.09	<.0001
rove	1	-0.011	0.0038	-0.0185	-0.0036	8.41	0.0037
cfoe	1	0.0008	0.0002	0.0004	0.0012	15.26	<.0001
contrl 0	1	0.1484	0.0967	-0.0412	0.338	2.35	0.1249
contrl 1	0	0	0	0	0	.	.
lnmv	1	-0.0277	0.0181	-0.0632	0.0078	2.34	0.1262
dslg 0	1	0.1312	0.0706	-0.0072	0.2695	3.45	0.0631
dslg 1	0	0	0	0	0	0	0
nepr	1	0.0011	0.0008	-0.0004	0.0026	2.08	0.1492
cprice	1	-0.0074	0.0017	-0.0108	-0.004	18.11	<.0001
scale	1	1.0877	0.0221	1.0453	1.1318		

Table 53 uses the LIFEREG program in SAS to execute Tobit Analysis of the factors that influence dividend payouts in Canadian firms. The analysis uses left censored values to isolate firms that did not use dividend payouts. The distributions used are normal and lognormal. The response variable is dividend payout ratio (divpay) and the predictor variables are (a) return on assets (rove) (b) liquidity (cfoe) (c) domestic control (contrl 1) and foreign control (contrl 0) (d) size (lnmv) (e) dual class (dslg 1) and single class (dslg 0) (f) net profit ratio (nepr) and closing stock market price (cprice). All the models converged.

In conclusion, several key observations can be made from the multivariate regression results in tables 46 to 53. Firstly, Liquidity remains the single most statistically significant variable that explains dividend payout ratio. This observation is not only confirmed in the multiple regression results but also in the Tobit analysis. In the same way, only Dual class structure does not appear to have any significant effect on dividend payout ratio. Secondly,

Current Ratio, Size and Dual Class Structure are the key variables that significantly explain share repurchase expenditures, although it is noted that the model is not robust. Thirdly, dividend yield is not explained by Liquidity regardless of whether the sample is only dividend payers or the total sample of listed and delisted firms. The foregoing conclusion notwithstanding, several variables such as Net Profit Ratio, Return on Assets, Size and Closing Market Price of the shares do significantly affect dividend yield. Fourthly, the characteristic-based predictors tend to have significantly higher effect on the respective response variables than the performance or valuation-based variables. Fifthly, the multivariate regression results and the results from the Tobit analysis are consistent with conclusions drawn from other aspects of this study. This study has documented a consistent decline in dividends over the study period and has also confirmed that liquidity is the most statistically significant variable in explaining dividend decision. Moreover, from the liquidity constraint analysis, it was further documented that dividend payments are statistically sensitive to liquidity, thereby reinforcing the conclusions derived from the multivariate regression results.

5.0 CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

Corporate payout policy in general and dividend policy in particular have remained an active area of research in corporate finance since the promulgation of the M&M dividend irrelevancy proposition. While the empirical validation of the theoretical proposition on dividends has centered predominantly on information effect of dividend announcements, most of the research has been dominated by U.S. studies and we know very little in the Canadian context.

This study has reviewed the trends in dividends and share repurchases, its nature and pattern in Canadian firms and partly provided explanation of the observed phenomena. In addition, this study has investigated the sensitivity of liquidity to dividend decisions in Canada, and reviewed and analyzed the role and effects of tax policy changes on dividend and share repurchase activities of Canadian firms. This study has also tested specific hypotheses of various variables that potentially affect dividend and share repurchase decisions. Some of these variables are performance based, while others are valuation-based and the rest are relatively permanent characteristics of the firms in question. Finally, this study has investigated the joint impact of the performance, valuation and characteristic-based variables on dividends and share repurchase decisions in Canadian firms, using multiple regression, and Tobit regressions to address the effects of censoring.

5.1 Major conclusions

From the review and analysis of the Canadian market, this study has arrived at several key observations and conclusions. The Canadian capital market is different in many dimensions, including among others, the foreign control over many firms, less liquid capital markets in comparison with the U.S. markets, and relatively different tax regimes. As such, it provides an interesting market environment for independent verification of the theoretical propositions of corporate payout policy and the different roles played by dividends and share repurchase decisions. The foregoing differences in market dimensions notwithstanding, there are some similarities between the Canadian and U.S. markets, as well as some marked differences based on the findings of this study as outlined in Table 54 and summarized in the ensuing conclusions.

Table 54: Significant differences and similarities between Canadian and U.S. results

Issues	Canadian Results from present study	U.S and other Results from past studies
Proportion of dividend paying firms	Declined from 54.01% in 1987 to 23.08% in 2001	Declined from 66.5% in 1978 to 20.8% in 1999 [Fama and French, (2001)]. Special dividends paid by dividend-paying NYSE firms disappeared from 61.7% in the 1950s to 4.9% in the 1990s[DeAngelo, DeAngelo & Skinner (2000)]
Proportion of firms who never paid dividends	Increased by 39.15% from 27.16% in 1987 to 66.31% in 2001	Increased by 45.4% from 24.7% in 1987 to 70.1% in 1999 [Fama and French (2001)]
Proportion of former payers	Declined by 8.22% from 18.83% in 1987 to 10.61% in 2001	Increased by 0.3% from 8.8% in 1987 to 9.1% in 1999 [Fama and French (2001)]
Median dividend yield	Declined from 2.5% in 1987 to 2.27% in 2001 (3.72% in 1990)	Declined from 5.3% in 1945 to 4.1% in 2000 [Carlson (2001)]

Median dividend payout ratio	Declined from 58.2% in 1991 to 34.13% in 2000	Declined from 72% in pre-war period to 51% in post-war period [Carlson (2001)]
Average dividend payout ratio and average repurchase ratio of firms with positive earnings only	Average repurchase ratio increased from 1.57% in 1987 to 10.4% in 2001. Average dividend payout ratio decreased from 42% in 1987 to 36% in 2001	Average repurchase ratio increased from 2.8% in 1972 to 12.4% in 2000; Average dividend ratio decreased from 21.4% in 1972 to 11.4% in 2000 [Grullon and Michaely (2002)]; Average repurchase ratio increased from 5.12% in 1978 to 31.42% in 1999 [Fama and French (2001)]
Characteristics of dividend paying firms, their logit estimates and test of significance	Size of the firms with beta of 0.57 and t-statistic of 43.19; Investment opportunities with beta of -0.0023 and t-statistic of -6.72; Profitability with beta of 0.0246 and t-statistic of 4.15. There is also a negative relationship between size and dividend payout ratio.	Size of the firms with beta of 5.03 and t-statistic of 37.84; Investment opportunities with beta of -0.83 and t-statistic of -16.93; Profitability with beta of 10.47 and t-statistic of 12.20 [Fama and French (2001)]; Large companies pay dividends while smaller firms usually do not [Redding (1997)]. There is also a negative relationship between size and dividend payout ratio [Keim (1995) and Farinha (2002)]
Earnings volatility of firms that use share repurchases compared to those using dividends	Firms that use dividends tend to have positive earnings and low earnings volatility and tend to be large firms. Firms that use share repurchases tend to be smaller firms with high earnings volatility.	Firms that use dividends have more stable earnings than those that use share repurchases [Jagannathan, Stephens and Weisbach (2000)]. Firms that pay dividends have lower variability of return on assets than firms that do not pay dividends; Firms that use share repurchases are smaller in size, have higher investment opportunities and have higher earnings volatility [Grullon and Michaely (2002)]
Reasons for decline in dividends	Liquidity constraint partially explain dividend payouts in Canada; There is also the substitution of share repurchases for dividends	Changing characteristics of firms towards small firms and Low propensity to pay dividend [Fama and French (2001)]. Substitution of share repurchases for dividends [Grullon and Michaely (2002)]
Degree of firm liquidity constraint as measured by	On average 45.47% of firms experienced a turnover from one class of liquidity constraint to another	The observed average turnover rate for Not Financially Constrained, Partially Constrained and Financially Constrained firms were 40.9%, 52.3%

liquidity turnover		and 37.3% [Cleary (1999)]
Effect of foreign control on share repurchases and dividends	Foreign controlled firms pay more dividends than domestic controlled firms, while foreign controlled firms spend less on share repurchases than domestic controlled firms. There is therefore a positive relationship between foreign control and dividends and a negative relationship between foreign control and share repurchases.	Contrary to the Canadian observation, there is a positive relationship between foreign ownership and share repurchases and a negative relationship between foreign ownership and dividends [Liljeblom and Pasternack (2002)]
Low Q and High Q firms	Low Q firms have lower debt ratio compared to High Q firms	Low Q firms have higher debt ratio compared to High Q firms [Chung and Wright (1998)]

With respect to time trends in dividends, the major observation and conclusion from the study is that the proportion of dividend paying Canadian firms declined sharply from 54.01% in 1987 to 23.08% in 2001. From the existing literature, this is the first formal Canadian study that has documented a decline in dividends. The Canadian observation is consistent with the Fama and French (2001) results from the U.S. market and further highlights the fact that dividends are disappearing in Canada. The decline in the percent of Canadian firms paying dividends may significantly be explained by the growth in the number of newly listed firms feeding into the sample of firms in the study and the growing proportion of firms that never became dividend payers, coupled with the effects of firms who substituted share repurchases for dividend payments.

In terms of dividend yield and dividend payout, the important observation from the Canadian data is that over the period from 1987 to 2001, the median dividend yield declined in most periods. With the exception of the period from 1987 to 1990, when the median yield increased from 2.5% to 3.72%, the median yield has generally declined to 2.27% as at 2001. The median dividend payout ratio has also experienced a decline from 58.20% in 1991 to 34.13% in 2001. From the U.S. market, Carlson (2001) observed that average dividend payout of firms on the S&P 500 have declined from pre-second war level of 72% to a postwar level of 51%. The decline in dividend payouts also mirrored the decline in dividend yield from 5.3% in 1945 to 4.1% in 2000. DeAngelo, DeAngelo & Skinner (2000) also showed that special dividends once commonly paid by NYSE firms have gradually disappeared over the last 40 to 50 years from 61.7% of dividend-paying NYSE firms to 4.9% during the first half of the 1990s. It is important to note that the decline in dividend payout ratio in the Canadian market has equally mirrored the decline in the dividend yield and the Canadian results are therefore consistent with the findings in the U.S. market.

There are also similarities between the Canadian market and the U.S market with respect to corporate payouts in the form of share repurchases or dividends. The major conclusion from the trends in corporate payout in Canada is the growth and prominence of share repurchases activity during the sample period from 1987 to 2001. During this period, the proportion of share repurchase to total payout increased from 3.72% in 1991 to 33.04% in 2001 (42.73% in 1996), while the proportion of dividends to total payout (i.e., the sum of share repurchases and dividends), declined from 96.28% in 1991 to 66.96% in 2001

(57.27% in 1996). These results are also consistent with the declining dividend payout ratios and dividend yields, respectively. The growth in the proportionate use of share repurchases to total payout by Canadian firms with negative earnings from 0.95% in 1987 to 73.94% in 2001 is also consistent with the findings of Jagannathan, Stephens and Weisbach (2000) and shows that share repurchases are used by firms as a way of preserving financial flexibility. An equally important conclusion from the Canadian studies is that although firms with positive earnings tend to pay higher dividends than share repurchases, their proportion of share repurchase expenditure to total payout actually grew from 3.68% in 1987 to 22.25% in 2001 (33.20% in 2000).

With respect to characteristics of Canadian firms that pay dividends and repurchase shares, this study has concluded that profitability, investment opportunities, size, and cash flow are important fundamental factors that influence the decision to pay dividends or the decision to repurchase shares. Firms who repurchase shares are less profitable, have greater investment growth potential, tend to be smaller in size, and generate lower cash flow. On the contrary, firms who pay dividends are more profitable, have lower investment opportunities, tend to be larger in size, and generate higher cash flow from operations. To further buttress the foregoing observations, logit regressions confirm that larger firms have a greater likelihood to pay dividends while smaller firms have a greater likelihood to repurchase shares. Moreover, more profitable firms are likely to pay dividends, while less profitable firms may find share repurchase a more preferable payout option. Finally, firms with greater investment opportunities are less likely to pay dividends but more likely to repurchase shares as a payout option.

The results from Canadian dividend payment activities are consistent with the findings from the U.S. market in several areas. For instance, Fama and French (2001) concluded that larger firms are more likely to pay dividends with average coefficient of 5.03 and t-statistic of 37.84. In the case of the Canadian study, the impact of size on the likelihood of paying dividends is 0.57617, with t-statistic of 43.19. This implies that there is a positive and statistically significant relationship between size and the decision to pay dividends. The effect of size on dividends in the Canadian market also confirms key findings of size-based studies in the finance literature such as the findings of Redding (1997) from the US market, who confirmed that large corporations choose to pay dividends, while small corporations owned by individuals do not usually pay dividends. However, when firms do pay dividends, the Canadian market confirms a negative relationship between the size of the firm and the amount of dividends paid as reflected by the dividend payout ratio. This implies that smaller firms have higher dividend payout ratios than larger firms. This conclusion is also consistent with the findings of Keim (1985) and Farinha (2002) who observed a significant negative relationship between the size of the firm and dividend payout ratio for firms on the NYSE and the London Stock Exchange, respectively. Fama and French (2001) also observed a negative impact of investment opportunities on dividend payments with average coefficient of -0.83 and a t-statistic of -16.93. They further observed a positive effect of profitability on dividend payments with average coefficient of 10.47 and t-statistic of 12.20. In the case of the current Canadian study, there is a negative effect of investment opportunities on dividend payments with

average coefficient of -0.00263 and t-statistic of -6.72. In terms of the effect of profitability on dividend payments, the average coefficient is 0.0246 with t-statistic of 4.15.

The observations from Canadian share repurchase activities are consistent with the observation of the U.S. market in some aspects, in that Jagannathan, Stephens, and Weisbach (2000) found that firms that pay dividends have more stable earnings than do firms that use share repurchases which is consistent with the Canadian experience. However, in other aspects, the Canadian share repurchases activities are different from the U.S. For instance, Grullon and Michaely (2002) observed that firms that repurchase shares tend to be small in size, with high market-to-book ratios (high investment opportunities), and with high earnings volatility whereas in Canada, smaller firms tend to have low market-to-book ratios (fewer investment opportunities). Moreover, Fama and French (2001) found that repurchasers are almost always dividend paying firms, but in Canada, only 19% of firms that engaged in share repurchase activities were dividend payers. This implies that in Canada, about 81% of firms that used share repurchases were dividend non-paying firms.

The results from the earnings volatility analysis are equally striking. This study has documented that low earnings volatility firms in Canada pay higher dividends than high earnings volatility firms, irrespective of the share repurchase policy they follow. The reasons for the foregoing conclusion are that low earnings volatility firms tend to have positive and stable earnings and larger market capitalization and therefore are willing and able to follow established dividend policy. On the other hand, high earnings volatility firms

tend to experience periodic negative earnings, have relatively lower market capitalization, and tend to spend relatively higher proportion of their payout amount on share repurchases rather than on dividends.

This study is the only known study that has examined how dual-class firms exhibit different dividend pattern than single-class firms. Over the period from 1987 to 2001, the disappearance of dividends has been more prominent in the single-class firms than in the dual-class firms. For instance, the proportion of firms that pay dividends and have dual-class shares declined from 67.09% in 1987 to 50% in 2001, while the proportion of single-class firms paying dividends declined from 49.80% in 1987 to 18.01% in 2001. These observations were subsequently validated using a set of matching firms. The results from this study confirm the conclusions from agency theory that dual firms tend to pay more dividends than single-class firms. Dual-class firms also tend to have higher dividend yields and dividend payout ratios which are statistically significant than single-class firms. Dual-class firms are more diversely-held than single-class firms, and because of separation of ownership from control, single-class firms tend to under-perform dual-class firms, according to agency theory and its empirical findings. Hence, the high performance of dual-class firms is reflected in the higher proportion of firms paying dividends even during the sample period when dividends have been disappearing.

This study has empirically confirmed for the first time in the finance literature that liquidity plays an important role in the dividend payment decisions of firms in the

Canadian market. Based on the Mean Rank Liquidity Index classification system, this study has concluded that there is a positive relationship between liquidity and dividend expenditure with a coefficient estimate of 0.15 and *t*-statistic of 11.075. This study has also concluded that least constrained Canadian firms are more sensitive to liquidity when making dividend payment decisions than severely constrained Canadian firms with coefficient and *t*-statistic of 15.268 (20.271) and 1.930 (6.618), respectively. Simply put, dividends are less sensitive to liquidity for more constrained firms. The foregoing observation confirms the inverse relationship between the least constrained and severely constrained groups of firms as far as cash flow-dividend expenditure sensitivities are concerned. It is, however, noted that although a positive relationship was established between share repurchase expenditures and current ratio as a measure of short-term liquidity, the relationship between cash flow and share repurchase expenditure was not statistically significant. Moreover, there was no statistical significance for the respective groups of least, partial, and severely constrained firms. The reason for this observation is that share repurchases are used to pay out cash flows that are potentially temporary, with a view to preserving short term financial flexibility. Dividends on the other hand do not change in the short run and are more influenced by the long-term liquidity of the firm.

In terms of Domestic and Foreign Control, the main observation in the Canadian market is that foreign controlled firms pay more dividends on average than domestic controlled firms, whereas in terms of share repurchases, domestic controlled firms spend more than foreign controlled firms. Moreover, domestic controlled firms have higher dividend yield than foreign controlled firms because foreign controlled firms tend to have higher market

price per share than domestic controlled Canadian firms. Subsequent analysis, using matching firms, confirmed the foregoing conclusions. It is equally important to note that the Canadian observation is contrary to the documented findings of Liljeblom and Pasternack (2002) who observed a significant positive relationship between foreign ownership and share repurchases and a negative relationship between foreign ownership and dividend payments. They concluded that foreign ownership is, perhaps, the single most important variable associated with share repurchases in Finland. While further studies are warranted in order to discover the factors explaining the Canadian findings, it is evident from the literature that in the absence of foreign investor tax credit on dividends, foreign controlled firms may have a greater propensity to pay lower dividends and adopt share repurchases as the payout option. Moreover, where foreign investor tax credit is available, the differential dividend tax credit between the foreign and the domestic countries in question may also affect the choice the firm will make in terms of adopting dividends or share repurchases as the payout option. In addition, the changes in tax incentives in Canada over the study period may also affect the time trends in dividends among the domestic and foreign controlled firms. It is therefore important to further investigate the role foreign investor tax credit plays in the documented evidence that foreign controlled firms pay more dividends and spend less on share repurchases than Canadian controlled firms.

The investigation of the impact of an increase in the capital gains inclusion rate during the period from 1988 to 2000 did not yield a statistically significant effect on share expenditure activity of the firms in the sample. Part of the explanation may be the relatively small effective differential tax rate between dividends and capital gains over the

sample period under study. It is interesting to note that during the period of the increase in capital gains inclusion rate, share repurchase activities actually continued to increase while dividend payments decreased. Thus, the observations from the tax impact analysis may provide additional support to the shift in payout policy by Canadian firms from dividends to share repurchases over the sample period given that the change took place during the period of significant increase in capital gains inclusion rate.

This study has also investigated the effects of several explanatory variables on dividend decisions of Canadian firms using cross-sectional and time-series multiple regression modeling. From the performance-based variables, Liquidity appears to be the key explanatory variable for dividend decisions in Canadian firms, with a t-statistic of 8.863 and a standardized coefficient of 0.243. With the exception of 1998, liquidity significantly influences the amount of dividend payment for each of the years in the sample period. From the characteristics-based variables, domestic-foreign control appears to have the most statistically significant positive effect on dividend decisions, with a t-statistic of 2.619 and a standardized coefficient of 0.073. Size also remains statistically significant, and negatively related to dividend decisions with a t-statistic of -2.127 and a standardized coefficient of -0.066. The significant impact of liquidity on dividend payment decisions from the multiple regression results corroborates with the observation that dividend payment decisions are sensitive to liquidity constraint. Tobit analysis, which addresses the concerns of censoring, has further confirmed that liquidity remains the most statistically significant variable that explains dividend payout ratios in Canadian firms. However, whereas there are other variables such as foreign control and net profit ratio that have a

higher impact on dividend payout ratios, their significance in the payout decision process are less important. From the preceding discussion, Fama and French (2001) concluded that the decline in dividends is the result of changing characteristics of firms that never paid dividends and the lower propensity to pay dividends. Grullon and Michaely (2002) on the other hand credited the dividend disappearance phenomenon to the substitution of share repurchase activity by noting that established firms partially financed their share repurchases with potential dividend increases. This Canadian study has for the first time confirmed that the disappearance of dividends is partially explained by the changing liquidity situation of the firm. The volatility of liquidity is further evidenced by the heavy turnover of firms based on their mean rank liquidity index values and the inverse relationship between the sensitivity of dividend payment behavior of the firm and its liquidity constraint.

Finally, although Julio and Ikenberry (2004) have recently documented what appears to be a resurgence of dividends in the U.S. market, it is important to situate their observation in context with this present study. Firstly, the period of the observed increase in dividend payers is from 2002 to 2004, which is outside the 1987 to 2001 window for the current Canadian study. Secondly, the 2002 to 2004 period is simply too short a period for drawing any meaningful long-term inference about shifts in the trend of dividend payment. Dividends are relatively permanent commitment to shareholders, and as noted by Fama and French (2002) are “sticky” and do not change very much in the short run. Thirdly, the apparent rise in proportion of dividend payers is just 4% above the 16% low levels in 2001. As such the findings of Julio and Ikenberry (2004), as commented by the authors, may

simply be the immediate reaction of the effect of the Bush tax cut or partly the effect of a conscious attempt by large corporations to reassure investors about the “quality” of their earnings, following the recent bear market, and not a shift in long-term dividend policy. The Canadian observations and conclusions therefore remain valid given that Canada has not experienced any significant shift in tax policies affecting dividends and share repurchase activities in recent years. Moreover, the observations from this study are consistent with the experience of the U.S. market over the sample period from 1987 to 2001.

5.2 Implications of the study

This section outlines the benefits and implications that can be deduced from the major conclusions of this study.

Evidence from the cross-sectional sample of this study has demonstrated for the first time that dividend payment decisions of least-constrained Canadian firms are significantly more sensitive to liquidity than severely-constrained firms, thus confirming that the liquidity situation of a firm may partially explain the changes in its dividend payout expenditure over time. This finding is new in the literature and may play a significant role in future research on payout decisions of firms. To emphasize the importance of liquidity in corporate finance decisions such as dividend payments, and the timeliness of the conclusions from this study, in March 2002, Moody's Investors Services initiated Liquidity Risk Assessment ("LRA") of its major commercial paper issuers. The LRA methodology is non-quantitative in nature but uses the traditional techniques of fundamental credit analysis, and seeks to address the ability of the firms to cope with abrupt loss of access to the capital and credit markets as a result of the occurrence of a name-specific event. The LRA focuses on three factors namely, the reliance on short-term funding, adequacy of on-balance sheet liquidity and adequacy of alternative liquidity. Indeed, one of the fundamental themes in the firm's setting of dividend policy is its ability to access external financing as and when required, given that dividend payments affect the availability of internal funds. Hence, this study has demonstrated that dividend decisions of firms with high creditworthiness are more sensitive to liquidity than firms that are less creditworthy.

Indeed, Aivazian, Booth and Cleary (2004) have documented that a firm's dividend policy depends critically on its access to and reliance on public debt markets, and that firms with bond ratings have a higher propensity to pay dividends and that those with higher ratings are even more likely to pay dividends. The results of the liquidity constraint analysis from the current study are not inconsistent with the observations of Aivazian, Booth and Cleary (2004). The reason is that firms which do not face liquidity constraint have greater access to the external capital markets than those that are severely constrained, and that dividend payments of severely constrained firms are less sensitive to liquidity while dividend payments of least constrained firms are more sensitive to liquidity.

Consistent with the observed sensitivity of liquidity to dividend payout decisions, this study has documented that Canadian firms experienced a growth in the use of share repurchases over the period from 1987 to 2001. During the foregoing period, dividend payments drastically diminished. This apparent shift in payout policy from dividends to share repurchases is an important observation, and underscores the responsiveness of share repurchases to potential future liquidity constraint, in comparison with dividend payments. Indeed, regardless of the level of earnings volatility of the firms, the proportion of total payout expenditure allocated to share repurchases gained prominence over the sample period. In particular, the proportion of share repurchases expenditure to total payout expenditure for high earnings volatility firms increased from 37.18% in 1987 to 60.76% in 2001 while the proportion allocated to dividends fell from 62.82% in 1987 to 39.24% by 2001. From the foregoing, the observed decline in dividends and the growth in share repurchases is consistent with the view that firms who pay dividend may be at competitive

disadvantage than those who do not pay dividends, since dividend paying firms have higher cost of equity, given that dividend tax is generally higher than capital gains tax.

This study has also documented that there are several key explanatory variables that have statistically significant effect on dividend and share repurchase decisions. Some of these variables are performance-based while others are valuation-based, and the remaining variables relate to certain permanent characteristics of the firm. For instance, it has been documented in this study, and validated through the use of matching sample, that dual-class firms consistently pay higher dividends than single-class firms. This study has also documented that foreign-controlled firms pay more dividends than domestic-controlled firms. In addition, this study has confirmed a negative effect of size on dividend payment decisions, coupled with the statistically significant positive effect of liquidity on dividend decisions, respectively. The explanatory variables could play a significant role in portfolio construction, asset allocation, and rebalancing strategies of mutual funds and investment firms.

While this study observed a slight decline in many of the share repurchase measures after the 1987 budget announcement of the increase in capital gains inclusion rate from 50% to 75%, none of the differences between the pre-announcement and post-announcement share repurchase measures were statistically significant. It is nevertheless important to note that the primary reason for the lack of statistical significance is probably due to the relatively small effective differential tax rate between dividends and capital gains tax. Canada has not, in recent years, experienced significant dividend and or capital gains tax changes of

the magnitude of the dividend tax cut introduced into law in the U.S. in 2003 by President Bush. Tax policy changes do affect dividends and share repurchase activities, however, it is the magnitude of the differential tax rate between dividends and capital gains that determines the extent to which it becomes relevant in corporate payout decisions.

5.3 Recommendations for future research

From the analysis and conclusions discussed in this study, several future research issues remain to be answered.

Firstly, there is the need to investigate the characteristics of newly listed firms and the role they play in explaining the dividend payment patterns in Canada.

Secondly, there is the need for further assessment of the impact of tax policy changes on dividend payments and share repurchase activities in Canada. This could be achieved by investigating other response measures that may be better proxies for capturing the effects of tax policy changes on payout policy.

Thirdly, further research is needed to ascertain the other factors that may explain the Canadian findings as it pertains to the effects of domestic-foreign control and dual-class firm structure on dividend and share repurchase decisions. The reason for the foregoing is that this study has effectively eliminated the possibility of bias resulting from non-comparability of the domestic-controlled and foreign-controlled sub-samples, through the use of matching sample analysis.

Finally, it would be equally important to investigate the impact of the recent rebound in the equity market on the proportion of dividend payers in the Canadian market for the post-2001 period.

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APPENDICES

Appendix A: Theoretical departures from M&M dividend irrelevance proposition

Theoretical Departures	Author	Description
Tax Clientele Hypothesis	Miller and Modigliani (1961)	In a world of taxation, investors will form clienteles with unambiguous preferences for specific dividend yields. The unambiguous preferences will be influenced by the marginal tax rate of the investor. High-income investors facing high marginal tax rates will prefer more capital gains as a payout policy than dividends since dividend tax is higher than capital gains tax. To further support the tax clientele hypothesis, the authors note that there is a substantial (and growing) fraction of total shares outstanding that is currently being held by investors for whom there is no tax differential (non-taxable) such as the pension funds. There are other institutions where the tax advantage is, if anything, in favor of dividends, such as casualty insurance companies and taxable corporations generally.
	Miller and Scholes (1978)	The authors sketch a simple model in which the seeming tax discrimination against dividends is completely neutralized. From the Strong Invariance Proposition, the authors note that given the firm's investment decision, the firm's dividend decision will have no effect on the wealth or economic welfare of its shareholders. The authors cite the clientele explanation for dividends as weak since investors can undo the tax effects of dividends by (i) increasing borrowing and thus generating tax deductible interest payments, and (ii) investing the proceeds in (risk-free) tax exempt insurance policies. The deductible interest payments reduce the tax exposure from the dividend income.
	DeAngelo Harry (1991)	<p>This article addresses the question: "Why do firms make taxable payouts when they can, assuming unlimited supply of zero NPV projects, simply reinvest and continuously defer taxes?" It does not address the share repurchase puzzle: "Why do firms pay dividends instead of repurchase stock?"</p> <p>Deferring payouts can eliminate the tax burden facing dividends. However, deferred payout by firms across the board implies deferred consumption. Since tax deferral and consumption are inherently jointly supplied goods, an excess aggregate supply of future consumption would result if firms adopted low or zero payout policies to capture tax deferral benefits.</p>
Information asymmetry and Signaling Hypothesis	Bhattacharyya (1979)	Dividends are used by management as a signaling mechanism to transmit private information to the market. Dividend functions as a signal of expected cash flows to the market.
	Miller and Rock (1985)	<p>They developed a signaling model in which insiders have incentive to manipulate dividend announcement effects for short-term gain. Firm insiders seeking short-term profit have an incentive to declare unwarranted dividends, thus temporarily increasing its stock price. They can only increase the firm's <i>net</i> dividend (financing held constant) by cutting investment. Outside investors expect such false signals and discount them appropriately. Failure to signal in this manner is then viewed as bad news. So a second-best dividend and investment policy results.</p> <p>The documented evidence of dividend-announcement effects clearly implies informational asymmetries between the investing public and the firm's decision-makers. With a net dividend approach (net dividend equals dividends paid less incremental borrowing), net dividend announcements supply missing information about the firm's current earnings, which are then extrapolated to form forecasts of firm value. Financing announcements are viewed as negative net-dividend announcements.</p>

Theoretical Departure	Author	Description
Information asymmetry and Signaling Hypothesis	John and Williams (1985)	<p>Shareholders pay income tax on dividends. Outsiders can perfectly audit the firm's current cash flow and earnings, but are imperfectly informed of value of future projects. In a separating equilibrium, firms with more favorable inside information pay higher dividends, have higher share prices, and have to sell fewer new shares to raise capital.</p> <p>Management maximizes the value of the firm to its current shareholders. Maximization occurs given the existence of a pricing function, which induces corporate insiders to signal truthfully with dividends, where the firm's market price is a function of its dividend. The authors show the existence of a pricing function for the firm's stock, which compensates sufficiently only stockholders of truly more valuable firms to induce their insiders to signal with larger dividends.</p>
	Ambarish, John and Williams (1987)	<p>Firms signal their productive opportunities through both dividends and investments.</p> <p>In an asymmetric information environment, outsiders lack knowledge of productivity of firm's current assets, or of firm's investment opportunities. Since the firm has multiple signals available, and since dividends face a tax disadvantage, dividends can then exist in equilibrium only if dividends and new issues collectively communicate all private information at lower cost than new issues alone.</p> <p>The announcement effect of new investment depends on whether the firm has private information mainly about assets in place (negative) versus information about future investment opportunities (positive).</p>
	Williams (1988)	In the efficient signaling equilibrium, the representative firm optimally distributes dividends, invests in risky real assets to maximize net present value, holds no financial securities, and sells new stock in the market. The firm finances its value-maximizing investment first from internal funds and second from stock sold to new investors.
	Ofer and Thakor (1987)	<p>Managers signal firm value by share repurchases and/or dividends. The authors noted that:</p> <p>(i) dividend increases and stock repurchases are followed by announcement effects in the form of stock price increases.</p> <p>(ii) however, stock purchases tend to lead to higher stock price increases than dividends.</p> <p>Some of the major findings of their model are:</p> <p>(i) both dividends and repurchases will generally be used as signals and neither dominates the other under all circumstances.</p> <p>(ii) repurchases convey relatively greater signal strength than dividends.</p> <p>(iii) firms paying only dividends never use outside financing to do so.</p>
Agency and Free Cash Flow Hypothesis	Black (1976)	The potential over-investment problem can be mitigated by paying dividends because they reduce the amount of free cash flow.
	Easterbrook (1984)	Dividend reduces the free cash flow that would otherwise have been spent by managers on negative net present value investments. By paying dividends, managers are forced to approach capital markets for new investments, which imposes extra discipline and reduces the cost of monitoring management.
	Jensen (1986)	Managers of corporations with large cash flows have the tendency to invest in low return projects although the presence of debt financing effectively removes the free cash flow.
	Bhattacharyya (1998)	Model assumes that the manager wants to maximize his net wealth and the principal recognizes this and sets up a screening contract to utilize the skill of the agent in the productive enterprise. The key finding is that for a given level of earnings, the lower quality manager declares a higher dividend than that declared by a manager with higher productivity. That is, dividends conditioned on earnings is bad news.

Appendix B: Empirical evidence on departures from M&M dividend irrelevance proposition

Author	Tax Clientele Hypothesis			Information Asymmetry and Signaling Hypothesis			Agency and Free Cash Flow Hypothesis			Data Used		
	Yes	No	Remark	Yes	No	Remark	Yes	No	Remark	Country	Period	Sample Size (firms)
Lintner (1956)				X		Partial adjustment model explains corporate dividend policy. Managers adjust dividends toward a target payout ratio while avoiding dividend reversals. Target ratio and speed of adjustment depends on a number of exogenous factors. Most managers believed that stockholders prefer a reasonably stable payout rate and that the market puts a premium on stability, thus most companies sought to avoid making changes in their dividend rates that might have to be reversed. Partial adjustments, based on current earnings, were used to avoid dividend reversals.				USA	1946-1955	28
Crockett and Friend (1988)		X	<p>The authors review progress in explaining one of the puzzles in corporate finance, i.e., in spite of the personal tax differential in favor of capital gains, firms pay out a large share of their earnings as dividends. They emphasize the failure of the payout ratio to rise significantly in response to declining tax rates in the post-World War II period.</p> <p>Available evidence indicates that tax clientele effects are surprisingly weak with institutional portfolios having similar dividend yield as the market, despite their low tax rates. Regression analysis shows tax rates to be at best marginally significant as a determinant of payout ratio.</p>		X	The article stresses the inapplicability of signaling models to explaining "real-world dividend behavior."				USA	1940-1985	NYSE firms (sample size not disclose)

Healy and Palepu (1988)				X		<p>Dividend initiations: (i) are surrounded, before and after, with positive earnings changes; (ii) provide announcement date returns that are correlated to future earnings growth; (iii) favorably update investor's expectations of future earnings growth. Managers appear to consider past, current, and future earnings performance when they decide to initiate or omit cash dividends. Investors interpret announcement of dividend initiations and omissions as managers' forecast of future earnings changes.</p> <p>This paper provides strong support for Lintner's (1956) description of managers' dividend decision-making process, and the dividend information hypothesis proposed by Miller and Modigliani (1961)</p>				USA	1969-1980	131 dividend initiations and 172 dividend omissions (NYSE; AMEX)
Bailey (1988)		X	<p>No evidence exists that investors prefer cash income to equal amounts of capital gains.</p> <p>Canadian law allowed sample firms to issue dual classes of equity having same priority and voting rights but differing in the means of payout and tax treatment. Class A shares received dividends, Class B received payouts in the form of deferred capital gains or stock dividends. In a small sample of firms, Class A shares sold at a premium, but such differences were attributable to transaction costs and factors unrelated to shareholder preferences.</p>							Canadian	1976-1983	9 TSE listed companies

Lang and Litzenberger (1989)					X	The signaling hypothesis predicts that dividend decrease would be very significant for a firm with $Q>1$, reflecting bad news. However, the daily return was statistically insignificant -.3% for such bad news events, contradicting the signaling hypothesis.	X		Jensen's free cash flow hypothesis implies that, for firms that over invest and have lower value ($Q<1$), share price increases should accompany dividend increases since greater dividend imply less cash available for over investing. On the other hand, value-maximizing firms ($Q>1$) should be affected less by announcements of dividend changes since they already invest optimally. Average daily returns for the sample of dividend-change announcements show only a 0.3% absolute change for firms with $Q>1$ and an average 1.1% change for firms with $Q<1$, consistent with the free cash flow hypothesis.	USA	1979-1984	429 dividend change announc ements
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DeAngelo DeAngelo (1990)	H, L				X		<p>Examines the impact of protracted financial distress on firm's dividend policy. Almost all sample firms reduced dividends and dividends are cut more often than omitted. Managers are reluctant to omit dividends, especially if there exist a long dividend history. Some dividend reductions seem strategically motivated to enhance bargaining, e.g. organized labor.</p> <p>Managers responded to financial distress with early and aggressive dividend reductions, with typical cuts in dividends of 70%. Managers of the sample firms typically state that dividend cuts were a result of current or expected losses, low or declining earnings, or to conserve cash.</p>				USA	1980-1985	80
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Ang, Blackwell, Megginson (1991)	X	<p>Provides evidence for existence of tax-related dividends clienteles</p> <p>As the British tax system changed its treatment of capital gains vs. ordinary income, so did the relative valuation of cash paying versus stock paying shares, providing evidence for the existence of tax-related dividend clienteles.</p> <p>During the period of favorable capital gains tax treatment, shares paying scrip (stock) dividends sell at a premium above shares paying cash dividends of equal pre-personal tax value.</p> <p>For the period when scrip (stock) dividends were taxed as ordinary income (no tax advantage versus dividends). As a result, cash shares now sold at a premium, the authors observe large-scale conversion of scrip shares into cash shares.</p> <p>The change in relative valuation, from the favorable capital gains regime, was approximately 12%.</p>							UK	1967-1982	12
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Howe, He and Kao (1992)				X		<p>As opposed to Lang & Litzenberger's (1989) observations on dividends, evidence supports information-signaling hypotheses vs. free cash flow theory for one-time cash disbursements.</p> <p>Following Lang & Litzenberger (1989), firms were designated as either high or low Tobin's Q. The free cash flow hypothesis predicts that overinvesting firms (low-Q) should experience positive excess returns following one-time cash flow announcements. But the data show no significant difference upon announcement and thus introduce an empirical puzzle because both dividends and tender offer buybacks have similar cash flow effects.</p> <p>The authors offer managerial entrenchment as a potential explanation of why the free cash flow hypothesis fails here. Low-Q firms that repurchase stock, instead of experiencing favorable returns, are viewed by the market as having value-reducing management with greater personal ownership percentage that is harder to displace.</p>				USA	1979-1989	55 tender offer repurchase and 60 specially designated dividend announcements
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Dhillon, Johnson (1994)					X	<p>Both the information content hypothesis and the wealth transfer hypothesis predict that stock prices should rise in response to a dividend increase. In contrast, the wealth transfer hypothesis predicts that bond prices should fall in response to dividend increases and is supported by the data.</p> <p>Mean excess two-day returns for stocks and bonds (respectively) show, for dividend increases (+1.53%, -.14%) and for dividend decreases (-3.47%, +0.63%). The opposition in sign supports the wealth transfer hypothesis.</p> <p>The author's state that the evidence does not rule out the information content hypothesis but they don't discuss this conclusion any further. Perhaps the data were not sufficiently strong for them to come to such a strong conclusion.</p>				USA	1978-1987	131 announcements of dividend increases and decreases
Eckbo and Verma (1994)							X		Managers have a preference not to pay out funds since they enjoy the discretion over free cash flow. The higher the managerial ownership, the lower the dividend payout.			
Michael, Thaler and Womack (1995)				X		<p>Immediate and long-term reaction to omission announcements is greater than to initiation announcements.</p> <p>Short run prices react more strongly to dividend omissions than initiations, but the reaction is similar if one controls for the magnitude of the changes.</p> <p>There exist significant long-term drifts following announcements of initiations and especially omissions.</p>				USA	1964-1988	561 dividend initiations and 887 dividend omissions

Yoon and Starks (1995)				X		<p>Cash flow signaling (vs. the free cash flow hypotheses) better explains wealth effects surrounding dividend announcements.</p> <p>After controlling for more variables, the evidence counters Lang & Litzenberger's (1989) support of the free cash flow hypothesis. Furthermore, dividend increases are followed by capital expenditure increases. The free cash flow hypothesis, as opposed to the cash-flow-signaling hypothesis, predicts the opposite: a reduction in capital expenditure by overinvesting firms.</p> <p>The three-day cumulative average abnormal return for dividend increases and decreases were: $q < 1$ (+1.54%, -5.30%) $q > 1$ (+0.67%, -4.60%)</p> <p>The free cash flow hypothesis predicts no change for firms having $q > 1$, whereas the cash flow signaling hypothesis predicts that all four numbers should be significant.</p> <p>Article also tests reactions of analysts' estimates of both current and future earnings to dividend changes. Both dividend increases and decreases affect current earnings forecasts. But future earnings forecasts only change in response to dividend decreases. This is generally consistent with the cash flow signaling hypothesis.</p>				USA	1969-1988	3748 dividend increases and 431 dividend decrease s
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DeAngelo, H; DeAngelo, L; Skinner, DJ (1996)					X	<p>Assesses empirical importance of dividend signaling</p> <p>The tests yielded no indication that favorable dividend decisions represent reliable signals of superior future earnings performance for these firms. Data also supports hypotheses that (1) managers tend to be overly optimistic about growth (2) dividend increases tend to be relatively small, and thus non-credible.</p> <p>Dividend-increasing firms have zero average abnormal stock performance over Years 1-3, indicating that the subsequent poor performance was anticipated in Year 0 and suggesting that the market paid no heed to the dividend increase.</p>				USA	1980-1987	145 NYSE firms
Benartzi, S; Michaely, R; Thaler, R (1997)					X	<p>They found only limited support for the proposition that dividends contain future earnings information.</p> <p>The evidence supports Lintner's model that there is a strong past and concurrent link between earnings and dividend changes, but the predictive value of changes in dividends seems minimal. Firms that increase dividends in Year 0 have experienced significant earnings increases in years -1 and 0, but show no subsequent unexpected earnings growth. Firms that increase dividends have significant (though modest) positive excess returns for the following three years. Thus the signal, if it exists, is not getting through.</p>				USA	1979-1991	1025 firms

DeAngelo, De Angelo and Skinner (2000)				X		Special dividends once commonly paid by NYSE firms have gradually disappeared over the last 40 to 50 years and are now a rare phenomenon. 61.7% of dividend-paying NYSE firms paid at least one special dividends, while only 4.9% of the same category of firms paid special dividends during the first half of the 1990				USA	1926-1995	1287 NYSE firms
Carlson (2001)				X		Average dividend yield of firms on the S&P 500 have declined from 5.3% in 1945 to 4.1% in 2000. As at 2000, dividend yield stood at 1.25%, a record low. The decline in dividend yield is mirrored by the decline in the average dividend payout, which has fallen from a pre-war level of 72% to a postwar level of 51%.				USA	1945-2000	S&P 500
Fama and French (2001)				X		The proportion of firms who were listed on the NYSE, AMEX and NASDAQ and paying regular dividends fell from 66.5% in 1978 to 20.8% in 1999. Moreover, recent decline in dividend yields appears to be of a longer-term trend.				USA	1926-1999	4441 of CRSP firms
Jong, Dijk and Veld (2003)	X		Dividend payments are significant and positively related to the existence of tax and behavioral preferences.				X		Dividend payments are significant and negatively related to managerial option plan. Stock buy-backs are significant and positively related to free cash flow and tax preferences for stock buy-backs.	Canada	1997	191 TSE firms

Appendix C: Definition of financial variables used in the study

	Variable	SPSS Code	Definition
1	Current Ratio	cura	$(\text{Total current assets}) \div (\text{total current liabilities})$
2	Size	lnmv	Natural log of (market value)
3	Size	lna	Natural log of (total assets)
4	Size	lnts	Natural log of (total sales)
5	Market value	mv	$(\text{Closing market price}) \times (\text{outstanding number of shares})$
6	Earnings before extraordinary expenditures	ebex	Net income before extraordinary items
7	Liquidity	cf_e	$(\text{Ebex} + \text{depreciation}) \div (\text{ebex})$
8	Debt Ratio	dera	$(\text{Long term debt including current portion}) \div (\text{bank loans} + \text{long and short term debt} + \text{total equity})$
9	Interest Coverage Ratio	inco	$(\text{Pre-tax income} + \text{interest expense}) \div (\text{interest expense})$
10	Cash Flow to Debt	cftd	$(\text{Cash flow}) \div (\text{bank debt} + \text{long term debt})$
11	Cash flow		Cash flow generated from operations
12	Net Profit Margin %	nepr	$(\text{Net income} - \text{minority interest}) \div (\text{revenue})$
13	Net income		Earnings before preferred dividends
14	Gross Margin %	grma	$(\text{Gross profit}) \div (\text{revenue})$
15	Slack	slak	$\text{Cash} + \text{short term investments} + (0.50 \times \text{inventory}) + (0.70 \times \text{accounts receivable}) - \text{short term loans}$
16	Investment-Cash Flow Ratio	incf	$(\text{Capital expenditure}) \div (\text{cash flow})$
17	Market-to-Book	prbv	$(\text{Closing stock market price}) \div (\text{book value})$
18	Book value	bv	$(\text{Total equity}) \div (\text{number of shares at year end})$
19	Dividend payout ratio	dpco	$(\text{Common dividend}) \div (\text{net income} - \text{preferred dividends})$
20	Dividend yield	diyi	$(\text{Dividend per share}) \div (\text{closing stock market price})$
21	Common dividend	div	Total dividend declared and normally paid to all classes of common shares during the fiscal year.
22	Total payout	tpay	$(\text{Common dividends}) + (\text{share repurchase expenditure})$
23	Share repurchase	repo	Total expenditure on share repurchased for common shares and preferred shares
24	Return on assets	roye	$(\text{Net income}) \div (\text{total assets})$
25	Price-to-sales ratio	prsa	$(\text{Stock market price}) \div (\text{sales per share})$
26	Share repurchase ratio	sr_e	$(\text{Share repurchase}) \div (\text{ebex})$

Appendix D. Mean Trends in Liquidity Constraint Variables

Appendix E. Median Trends in Liquidity Constraint Variables

Appendix F: Syntax for implementing the empirical p-value

Section 1

```
GET FILE='C:\documents and settings\Samuel Asiedu\My Documents\Analysis\Merged\Liquidity
Constraint Analysis\Simulation\Test data.sav'.
Set MITERATE = 1000 MXLOOPS = 1000.
UNIANOVA
  y BY group WITH x1 x2
  /METHOD = SSTYPE(3)
  /INTERCEPT = INCLUDE
  /OUTFILE = COVB( 'C:\documents and settings\Samuel Asiedu\My
Documents\Analysis\Merged\Liquidity Constraint Analysis\Simulation\regwt_obsgrpx2.sav' )
  /PRINT = PARAMETER
  /CRITERIA = ALPHA(.05)
  /DESIGN = group x1 x2 group*x1 group*x2 .
get file 'C:\documents and settings\Samuel Asiedu\My Documents\Analysis\Merged\Liquidity Constraint
Analysis\Simulation\regwt_obsgrpx2.sav' .
select if (ROWTYPE_ = 'EST').
execute.
rename variables (p7 p8 p10 p11 = x1b1vb3 x1b2vb3 x2b1vb3 x2b2vb3 ).
compute x1b1vb2 = x1b1vb3 - x1b2vb3 .
compute x2b1vb2 = x2b1vb3 - x2b2vb3 .
compute brk = 1.
save outfile = 'C:\documents and settings\Samuel Asiedu\My Documents\Analysis\Merged\Liquidity
Constraint Analysis\Simulation\difb_obsgrpx2.sav'
  / keep x1b1vb2 x1b1vb3 x1b2vb3 x2b1vb2 x2b1vb3 x2b2vb3 brk .
```

* Section 2 : Macro definition .

```
GET FILE='C:\documents and settings\Samuel Asiedu\My Documents\Analysis\Merged\Liquidity
Constraint Analysis\Simulation\Test data.sav'.
** rerun glm (samples) times with group membership randomly shuffled each time **.
define permglm( ).
***** Add any block of syntax to be bootstrapped here ***** .
* glm/ unianova with grp by x1 x2 interaction.
UNIANOVA
  y BY grp WITH x1 x2
  /METHOD = SSTYPE(3)
  /INTERCEPT = INCLUDE
  /PRINT = PARAMETER
  /CRITERIA = ALPHA(.05)
  /DESIGN = grp x1 x2 grp*x1 grp*x2 .
***** End of block of syntax for permutation test ***** .
!enddefine .
***permute macro reshuffles group membership randomly and runs unianova
on each reshuffle.
define permute (ngrps=!tokens(1)
  /samples=!tokens(1)) .
***repeat number of times specified for 'samples='.
!do !other=1 !to !samples .
set seed random.
compute gpran = uniform(1).
rank variables = gpran /ntiles (!ngrps) into grp.
formats grp (f8).
permglm .
match files / file = * / drop = gpran grp .
!doend
!enddefine.
```

*** Section 3.**

***** menu-pasted oms for unianova - Samuel's project ** .

* OMS.

OMS

/SELECT TABLES

/IF COMMANDS = ["UNIANOVA"]

SUBTYPES = ["Parameter Estimates"]

/DESTINATION FORMAT = SAV

OUTFILE = "C:\documents and settings\Samuel Asiedu\My Documents\Analysis\Merged\Liquidity
Constraint Analysis\Simulation\glm_paramx2.sav"

VIEWER = NO

/columns dimnames=['Statistics' 'Parameter'] .

*** Section 4.**

***invoke the macro, providing number of groups, number of samples .

permute ngrps = 3 samples = 1000.

omsend .

*** Section 5: Computing differences, merging files, tabulating results.**

get file "C:\documents and settings\Samuel Asiedu\My Documents\Analysis\Merged\Liquidity Constraint
Analysis\Simulation\glm_paramx2.sav" .

rename variables (B_grp1x1 B_grp2x1 B_grp1x2 B_grp2x2 = px1b1vb3 px1b2vb3 px2b1vb3 px2b2vb3) .

compute px1b1vb2 = px1b1vb3 - px1b2vb3 .

compute px2b1vb2 = px2b1vb3 - px2b2vb3 .

match files /file = * / keep = px1b1vb2 px1b1vb3 px1b2vb3 px2b1vb2 px2b1vb3 px2b2vb3 .

execute.

* merge oms file of simulation results to observed file of param differences.

compute brk = 1.

match files

/ file = *

/ table = 'C:\documents and settings\Samuel Asiedu\My Documents\Analysis\Merged\Liquidity Constraint
Analysis\Simulation\diffb_obsgrpx2.sav'

/ by brk.

execute.

* compute logical vars for test that simulated difference greater than observed diff

* for each of the parameter comparisons .

compute permx1b1b2 = (px1b1vb2 > x1b1vb2) .

compute permx1b1b3 = (px1b1vb3 > x1b1vb3) .

compute permx1b2b3 = (px1b2vb3 > x1b2vb3) .

compute permx2b1b2 = (px2b1vb2 > x2b1vb2) .

compute permx2b1b3 = (px2b1vb3 > x2b1vb3) .

compute permx2b2b3 = (px2b2vb3 > x2b2vb3) .

execute.

variable labels permx1b1b2 ' B1-B2 difference permute vs observed'

permx1b1b3 ' B1-B3 difference permute vs observed'

permx1b2b3 ' B2-B3 difference permute vs observed'

permx2b1b2 ' B1-B2 difference permute vs observed'

permx2b1b3 ' B1-B3 difference permute vs observed'

permx2b2b3 ' B2-B3 difference permute vs observed' .

value labels permx1b1b2 permx1b1b3 permx1b2b3 permx2b1b2 permx2b1b3 permx2b2b3 0 'permute <=
observed' 1 'permute > observed' .

FREQUENCIES

VARIABLES= permx1b1b2 permx1b1b3 permx1b2b3 permx2b1b2 permx2b1b3 permx2b2b3 .

SAVE OUTFILE='C:\documents and settings\Samuel Asiedu\My Documents\Analysis\Merged\Liquidity
Constraint Analysis\Simulation\glm_param_diff_x1x2.sav'

/COMPRESSED.