

Dividends vs. Share Repurchases Evidence from Canada: 1985-2003

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Abstract

This paper provides out-of-sample evidence on the payout policy in Canada during the 1985-2003 period. First, we show that the proportion of non-financial firms paying dividends has decreased, while the proportion initiating repurchase programs has increased. We also show that Canadian firms paying dividends and repurchasing shares are extremely concentrated. Second, we focus on the factors that could affect the choice between repurchases and dividends. We find that dividends and repurchases are used by different types of firms. While we do not confirm the financial flexibility hypothesis, our results are consistent with the substitution hypothesis after controlling for selection bias and endogeneity.

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1. Introduction

In recent years, open market repurchases have become increasingly popular in a large number of countries. In the United States, Grullon and Michaely (2004) report that in 1999 and 2000, for the first time in history, industrial corporations spent more money on repurchases than they did on dividends. Canada (Ikenberry, Lakonishok and Vermaelen, 2000) and the United Kingdom (Oswald and Young, 2004) also saw an increase in repurchase activity, and countries where stock buybacks were previously prohibited, such as Japan and Sweden, now allow firms to repurchase shares on the open market. Repurchase activity is also expected to grow globally as more countries adopt enabling regulations. Just as repurchase activity has grown in popularity, research on stock repurchases continues to evolve. However, existing repurchase literature is based mainly on U.S. evidence, and it is not clear how easily these U.S. results could be generalized to cover other markets operating under different tax and regulatory systems.¹ International evidence on payout policy will help us to explore the robustness of various U.S. results.

The only country outside the U.S. where dividends and share repurchases are available across a long time-series and with a cross-sectional scope is Canada (Ikenberry, Lakonishok and Vermaelen, 2000; de Jong, Van Dijk, and Veld, 2003). The Canadian

¹ Rau and Vermaelen (2002) suggest that most of the repurchase activity in the U.K. market is influenced by the tax consequences for pension funds, and that the regulatory environment limits the ability of managers to exploit underpricing opportunities. By contrast, Oswald and Young (2004) do not conclude that repurchase activity is mainly tax driven; they do however conclude that the underpricing hypothesis is robust in the U.K., just as it is in the U.S. and Canada.

stock market is of particular interest since it differs from its U.S. counterparts in many respects. First, the Canadian economy is ten times smaller and a much more natural resource-oriented economy. Secondly, share repurchases in Canada are considerably more regulated than those in the U.S. Specifically, open market repurchase programs in Canada are mandated to last for not longer than one year, and cannot be for more than the higher of 5% of the share base or 10% of the public float.² For U.S. companies, by contrast, there are no regulatory limits other than the mandated initial disclosures required to be made to the market. Thirdly, the way dividends and capital gains are treated tax-wise in Canada is completely different from the situation in the U.S.

The following are the four distinctive elements covered in our paper. First, the only Canadian study which examines both dividend and share repurchase decisions is that by de Jong, Van Dijk, and Veld (2003). While they analyze comprehensive private cross-sectional data around 1997 gathered through 191 usable questionnaires received from managers, we examine the payout decisions of non-financial Canadian firms using standardized accounting and stock market data over a large cross-sectional and time-series sample covering the period of 1985 to 2003. Secondly, by contrast with other Canadian studies, this panel data allows us to examine the evolution of the payout policy of non-financial Canadian firms and the evolution of the relative importance of dividends and share repurchases. We show that despite a different institutional, regulatory and tax environment, Canadian results are in line with those observed in the U.S. Over the period of 1985-2003, the proportion of non-financial firms paying dividends decreased, while

² Public float is the number of shares outstanding minus the number of shares held by blockholders.

the proportion initiating repurchase programs increased. The same conclusion applies to the total dollar amount paid out.

Thirdly, we focus on the factors that could affect the choice between repurchases and dividends. We use a multivariate probit model in which firm characteristics predict payout policy. Our results support the evidence that dividends and repurchases are used by different types of firms. We do not however find strong evidence to support the financial flexibility hypothesis in explaining the choice between share repurchases and dividends, as suggested by Guay and Harford (2000) and Jagannathan, Stephens, and Weisbach (2000).

Fourth and finally, we investigate whether managers substitute repurchases for dividends. Our cross-sectional and time-series data allows us to test the Grullon and Michaely (2002) test on out-of-sample data. We confirm that similar to the case with the results of their U.S. counterparts, dividend paying Canadian firms have been substituting share repurchases for dividends, after controlling for selection bias and endogeneity.

2. Canadian corporate payout policy

2.1 Open market share repurchases in Canada

The regulatory environment affecting Canadian open market repurchase programs differs from that in the U.S. Open market share repurchases in Canada are called Normal Course Issuer Bids (NCIBs), as compared to Substantial Issuer Bids (SIBs), which include fixed-price tender offers and Dutch-auction tender offers.³ NCIBs are regulated by stock exchange by-laws. In the U.S., all forms of stock repurchases are executed under the statutory requirements of the Securities Exchange Commissions (SEC).

³ As in the U.S., while Substantial Issuer Bids are permitted in Canada, they are not common (see Ikenberry, Lakonishok and Vermaelen, 2000).

Furthermore, a share repurchase program in Canada can only last for up to one year, and is limited to the greater of 10% of public float or 5% of outstanding shares of the class of shares approved for repurchase. For a 30-day period, the volume is limited to 2% of the number of outstanding shares, and in addition, in an open market repurchase, a firm is not allowed to buy back its shares at a price that is higher than their most recent trade price.

Unlike the U.S. SEC, the Toronto Stock Exchange (TSX) manages the way in which Canadian firms execute open market repurchase programs. However, as in the U.S., an approval at a shareholder meeting is not required; rather, a board approval is sufficient to initiate an NCIB. Once such board approval is obtained, an open market share repurchase firm must file a notice of intention with the TSX for authorization. A repurchasing firm must also file a repurchase activity report with the TSX within ten days following the end of every month. Once a month, the TSX publishes comprehensive records of the status of all authorized buyback programs. Most importantly, in Canada, there are explicit trading restrictions or additional disclosure requirements for insiders who wish to trade during a period when a buyback program is underway. The regulations in the U.S. SEC Rule 10b-18⁴ do not mention anything about disclosure. Thus, as noted by Grullon and Ikenberry (2000), the regulatory structure governing the entire buyback process in Canada is far more extensive and meaningful than what is present in the U.S.

Finally, as in the U.S., the proceeds to shareholders from open market stock repurchases are taxed as capital gains. For several years, the top marginal dividend tax

⁴ In November 1982, the Securities and Exchange Commission adopted Rule 10b-18. Grullon and Ikenberry (2000) note that 10b-18 is “the first and only rule that provides any legal structure and protection to the buyback process.” It is a “safe harbor” which means that firms can rely on this rule for protection against litigation for price manipulation if they comply with trading limits.

rate in Canada has been lower than the top marginal capital gains tax rate. Thus, a typical individual Canadian investor was better off with dividends than with capital gains. However, since the reduction in the capital gains inclusion rate from 75% to 66 2/3% and then to 50% (October 17, 2000), Canadian share repurchases now carry a tax advantage over dividends.

2.2. Data

Following Grullon and Michaely's (2002) example, we create an initial sample of all the companies that appear on the Compustat database⁵ for at least one year over the 1985 to 2003 period. Like Grullon and Michaely, we exclude banks, utility, and insurance companies. To be retained in the final sample, each firm-year observation must include information on the following variables:

- (1) Earnings (*EARN*), defined as total earnings before extraordinary items (Compustat item #18).
- (2) Market value (*MV*), defined as the market value of common stock at the end of the year (Compustat item #24 times Compustat item #25).
- (3) Dividends (*DIV*), defined as the total dollar amount of dividends declared on the common stock of the firm during the year (Compustat item #21).
- (4) Repurchases (*REPO*), defined as the total expenditure on the purchase of common and preferred stocks (Compustat item #115) minus any reduction in the

⁵ Research Insight (Standard & Poor's Compustat (North America)), version 7.9.

value (redemption value, Compustat item #56) of the net number of preferred stocks outstanding.⁶

The final sample includes 4,472 firm-year observations over the 1985 to 2003 period.

2.3. Trends in Canadian corporate payout policy

We use the data described above to examine recent trends in Canadian corporate payout policy. We examine whether in spite of a different institutional, regulatory and tax environment, the number of industrial Canadian firms paying dividends has significantly decreased, as in the U.S. (Fama and French, 2001),⁷ while the number of firms engaging in repurchases has increased (Grullon and Michaely, 2002). We also examine if, consistently with DeAngelo, DeAngelo and Skinner (2004), the aggregate dividends have significantly raised due to an increasing concentration in earnings and dividends. Table 1 reports aggregate cash distributions to equityholders. Over the period 1985-2003, the number of nonfinancial firms paying dividends has decreased, while the number initiating repurchase programs has increased. The same conclusion applies to the total dollar amount paid out. Table 1 indicates that in the mid 1980s, share repurchases represented a small fraction of total earnings and total dividends. For example, between 1985 and 1987, repurchases amounted to an average of 34.10% of dividend payments. However, since 1988, share repurchase programs have grown considerably. In 1989, repurchases peaked at 23.00% of earnings (CAD \$1,596.14 million). In the early 1990s, as the economy

⁶ Since our main objective is to compare dividends with repurchases, and not net repurchase activity to gross dividends, we do not subtract equity issuance from repurchases. We also do not consider the exercise of stock options since in so doing, we would be comparing a financing decision (share repurchase) with an investment decision (payment to labor). See Grullon and Michaely (2002) for an exhaustive discussion of share repurchase proxies.

⁷ Fama and French (2001) document that in the U.S., dividends have been disappearing since 1978. The propensity of firms to pay dividends has declined dramatically. Baker and Wurgler (2004a, b) document that this trend is the largest and longest, but that there have been three other earlier trends since 1963.

began contracting, repurchases decreased again, with aggregate repurchases amounting to CAD \$245.52 million, or 6.76% of earnings, in 1993. However, repurchase activity dramatically increased in the mid 1990s, reaching 21.45% of earnings and 41.33% of total payouts in 1998, and 21.20% of earnings and 33.11% of total payouts in 2000. On average, between 1985 and 1994, the proportion of dollars distributed through repurchases relative to dividends was 53.52%, while it stood at 99.61% between 1995 and 2003. Thus, share repurchase activity in Canada has experienced a profound transformation in the last 19 years.

***** Insert Table 1 about here *****

Figure 1 presents the equally weighted averages of payout activities throughout the sample period. It shows that the average dividend payout ratio declined from 45.37% in 1986 to 13.92% in 2002, while the average repurchase ratio increased from 11.45% in 1991 to 18.46% in 2002. Moreover, we notice that share repurchase activity peaked in 1998, 2000, 2001, and 2002. The total value of share repurchases exceeds the value of dividends for the first time in 1998. The repurchase payout ratio is also above the dividend payout ratio in 2000, 2001, and 2002. Although there are large discrepancies in the respective environments, we observe in Canada the same trends in the payout policy as in the U.S. In keeping with the observations of Grullon and Michaely (2002, p.1649) in the U.S.,⁸ non-financial Canadian firms spent more money on share repurchases than on dividend payments, and that is the first time in history share repurchase programs became more popular than dividends.

⁸ Grullon and Michaely (2002) show that in the U.S., just one year after the approval of the safe harbor provisions in 1983 (Rule 10b-18), the aggregate amount of cash spent on share repurchase programs tripled. Since then, the level of share repurchase activity has reached record highs. For instance, as a proportion of the total number of firms initiating a cash distribution to their shareholders, the number of firms that initiated a buyback program increased from 26.6% in 1972 to 84.2% in 2000.

***** Insert Figure 1 about here *****

Figure 2 shows the proportion of Canadian firms on Compustat each year that (i) do not have a payout policy, (ii) pay cash dividends, (iii) repurchase shares, and (iv) pay cash and repurchase shares. Overall, Figure 2 clearly shows the increases in the number of shares repurchased during the 1985-2003 period. Interestingly, in 1998, the proportion of dividend paying firms was equal to that of share repurchasing firms,⁹ and in 1999, the latter exceeded the former. In 2000, the proportion of share repurchasing firms is 25.67%, while that of dividend firms is 9.68%. We also notice an increase in the proportion of firms with a no payout policy, from 17.89% in 1983, to 50.68% in 2003.

***** Insert Figure 2 about here *****

Table 2 reports dividends, share repurchases and earnings concentration and their increase in 1985 and 2003. We rank dividend paying and share repurchasing firms by total dividends, share repurchases, and earnings in deciles. The first three columns report, for the dividend firm deciles, the total dividends, the proportion of dividends and the proportion of earnings, respectively. The last three columns report, for the share repurchase firm deciles, the total share repurchases, the proportion of share repurchases and the proportion of earnings, respectively. We find that the overwhelming majority of aggregate dividends are paid by a small proportion of firms, and that this concentration increases substantially over the 1985-2003 period. For example, the top 10% dividend payers distributed 91.69% of dividends, which is up from 80.61% in 1985. DeAngelo, DeAngelo and Skinner (2004) find that over the 1978-2000 period, the increasing

⁹ In the U.S., Fama and French (2001) find that the proportion of firms paying cash dividends falls from 66.5% in 1978 to 20.8% in 1999, due in part to the changing characteristics of publicly traded firms.

dividend concentration in the U.S. is partly due to increasing earnings concentration.¹⁰ We test this hypothesis among Canadian dividend payers, and find that earnings were indeed highly concentrated in 1985 and 2003. In 1985, the top decile dividend payers generated 80.61% of the earnings of all payers, and cumulatively, the top 20% of dividend payers generated 94.93%. The corresponding figures for 2003 are 91.69% and 97.18%. Like dividends, share repurchases are highly concentrated in 1985 and 2003. From 1985 to 2003, the total share repurchases by the largest 10% repurchasing firms increases markedly, from CAD \$396.05 million to CAD \$3,234.3 million. We also find that the top decile share repurchasing firms generates 87.19% and 83.12% of the earnings of all repurchasing firms in 1985 and 2003, respectively.

To summarize, since almost all of the increases in dividend and share repurchase concentrations are driven by the top decile, these concentration increases do not therefore result from a reduction in the proportion of payer and repurchasing firms.

***** Insert Table 2 about here *****

3. The choice between dividends and share repurchases

3.1. Background information

Brav, Graham, Harvey and Michaely (2005) survey 384 U.S. financial executives to determine which factors drive dividend and share repurchase decisions. They corroborate one of Lintner's key findings: dividends are sticky. Dividend payers are reluctant to cut dividends because of the market's asymmetric reaction to dividend increases and decreases, and non-payers are reluctant to initiate dividends because of this

¹⁰ DeAngelo, DeAngelo and Skinner (2004) document a two-tier structure based on dollar earnings. Most of the firms in the top-tier earnings bracket pay dividends and dominate the aggregate supply of dividends. They also conjecture that these top-tier earners are responsible for most stock repurchases. Fama and French (2001) show that repurchase activity is the prerogative of dividend paying firms. They thus increase the cash-out of firms that already pay dividends.

dividend conservatism. However, by contrast with Lintner, the survey results of Brav, Graham, Harvey and Michaely suggest that share repurchases now play an important role in payout policy. Their success is mainly attributable to their flexibility. They allow financial executives to modify their payout policy when they identify promising investment decisions. However, Brav, Graham, Harvey and Michaely (2005, p.484) find that “*management views provide little support for agency, signaling, and clientele hypotheses of payout policy. Tax considerations play a secondary role.*” Baker, Powell, and Veit (2003) also survey 642 top U.S. financial executives to learn their views about their firms’ share repurchases from January 1998 to September 1999. They suggest that the reasons for common stock share repurchases might have evolved over the past few decades.¹¹ Grullon and Michaely (2002) find that in the U.S., there is a substitution effect between dividends and share repurchases, and that large, dividend paying firms are repurchasing stock rather than increasing dividends. The evidence that dividends and repurchases are interchangeable payout methods is consistent with the undervaluation and the free cash flow hypotheses. Jagannathan, Stephens and Weisbach (2000) focus primarily on the choice between dividends and stock repurchases, and conclude that U.S. firms consider their need for flexibility when choosing between dividends and stock repurchases as a payout method. They find that firms tend to select stock repurchases over a dividend increase when “temporary,” non-operating income comprises a greater proportion of total income and when earnings tend to be more volatile. Guay and Harford (2000) also focus on the impact of the permanence of cash flow on the choice between dividends and repurchases, and report similar conclusions in the U.S.

¹¹ They find that repurchasing shares to adjust the firm's capital structure and to avoid dividend taxation appears to be more important than repurchasing in order to provide shares for incentive plans and to remove large blocks of stocks.

Dittmar and Dittmar (2002) examine how macroeconomic variables influence firms' payout policies and find that repurchases are indeed a way of distributing both transitory and permanent earnings, whereas dividends are a way of distributing only permanent earnings. They conclude that dividends and repurchases both substitute and complement each other.

Very few studies have examined repurchases in Canada, and they focus only on certain specific hypotheses appearing in the literature. Ikenberry, Lakonishok and Vermaelen (2000) focus on the undervaluation hypothesis, that is, the ability of managers to time the execution of share repurchases to coincide with when they believe their stock price is low. Li and McNally (2000) corroborate the undervaluation hypothesis. Testing a signaling model, they find that repurchase announcement returns are higher for firms characterized by insider holdings and free cash flows. The study by de Jong, Van Dijk, and Veld (2003) is the only one on the Canadian market which examines both dividends and share repurchase decisions. From firm characteristics obtained through questionnaires, they test three types of logit models – standard logit regressions, where dividends and share repurchases are studied in isolation; a simultaneous logit model, where dividends and share repurchases can influence each other, and a nested logit model, where decisions on whether or not to pay out, and then on the form of the payout, are analyzed sequentially. They find strong empirical evidence for the latter model. Their empirical results suggest that the payout decision of Canadian firms is primarily driven by the existence of free cash flows; the decision to pay dividends is then motivated by tax and behavioral preferences, while the decision to repurchase is motivated by tax preferences and the existence of managerial option plans. Consistent with Brennan and

Thakor (1990), their results show that the existence of asymmetric information among outsiders is associated with a preference for dividend payments over share repurchases. The approach considered in this paper differs from that of de Jong, Van Dijk, and Veld (2003). Our research is based on accounting and stock market data rather than on questionnaires, which allows us to test the relative evolution of Canadian payout policy over the 1985-2003 period. We focus on the choice between dividends and share repurchases controlling for Canadian interlisted firms and a reduction in the capital gains inclusion rate in Canada, and we test the substitution hypothesis following Grullon and Michaely (2002).

3.2. Hypotheses development

Our hypotheses are designed to examine the differences between firms that repurchase shares from those that distribute dividends. Specifically, we focus on a number of testable hypotheses regarding payout policy suggested by the Lintner (1956) model and by Brav, Graham, Harvey and Michaely (2005). We expect that dividend paying firms are likely to be large and well-established, and with high stable income levels. We also expect to observe significant differences between the characteristics of firms that repurchase shares and those that pay dividends.

Following Guay and Harford (2000) and Jagannathan, Stephens, and Weisbach (2000), we also hypothesize that dividends will be used to pay out cash flows that are likely to be permanent, while stock repurchases will be used for non-permanent cash flows. This leads us to assume a positive relation to exist between operating income and dividends, and a positive relation between repurchases and non-operating income.

Additionally, the Canadian stock market has the highest number of U.S. interlisted firms (211 firms in 2002, according to Karolyi, 2004). Canadian-listed firms can be partitioned into solely Canadian-listed and interlisted firms. Booth and Johnston (1984) conclude that interlisted stocks, traded on exchanges in both the U.S. and Canada, tended to be priced by U.S. investors, and to not be affected by Canadian tax changes. Therefore, we expect that interlisted firms would prefer capital gains over dividends, since the latter are taxed at a higher rate than the former in the U.S.

The taxation component is an important distinguishing factor between share repurchases and dividends. For several years, the top marginal dividend tax rate in Canada has been lower than the top marginal capital gains tax rate. However, since the capital gains inclusion rate was reduced from 75% to 66 2/3%, and then to 50%, Canadian share repurchases now carry a tax advantage over dividends. Thus, we estimate that Canadian share repurchase activity was constrained before this reduction in the capital gains inclusion rate (October 17, 2000).

Finally, we examine whether, as in the U.S. (Grullon and Michaely, 2002), Canadian firms have substituted dividends for repurchases. We examine whether the differences between actual and dividend payments forecast using the Lintner (1956) model become increasingly negative as firms engage in more and more repurchase activity.

4. The choice between dividends and share repurchases: empirical analysis

We first describe our data and examine, in a univariate context, each payout policy through different firm characteristics. We then discuss the choice between dividends and share repurchases in a multivariate context.

4.1. Data

For each observation in the final sample, we create the following variables using data from Compustat. *ASSETS* is the book value of assets (Compustat item #6). *MB* is equal to the book value of the total assets plus the market value of equity minus the book value of equity scaled by the book value of the total assets. *ROA* is the operating income before depreciation and amortization (Compustat item #13) scaled by the book value of the total assets. The $\sigma(ROA)$ is the standard deviation of *ROA*. *NOPER* is the non-operating income before depreciation and amortization (Compustat item #61) scaled by the book value of the total assets.

4.2. Univariate differences

Table 3 reports the relative importance of the dividend payout policy and repurchase activity for public non-financial Canadian firms. It shows that most firms are nonpayers (43.96%), and that 39.71% of firms pay dividends while 33.45% engage in stock repurchases.¹² Interestingly, repurchase activity is much more important for dividend payers than for non-dividend payers (81.81% vs. 18.19%).

***** Insert Table 3 about here *****

Table 3 also reports the characteristics of the firms in our sample by payout policy. It shows several interesting facts about the relation between firm characteristics and payout policy. Dividend paying firms are, as expected, larger than firms that repurchase shares. For example, the average (median) market value of firms that both pay dividends and repurchase is CAD \$2.05 billion (CAD \$383.66 million), compared to CAD \$1.00 billion (CAD \$267.53 million) for firms that pay dividends, but do not

¹² By comparison, de Jong, Van Dijk, and Veld de Jong (2003) document that from 1995 to 1997, 41% of firms paid dividends, 59% of firms did not do so, and 35% of firms engaged in a share repurchase program in the three-year period preceding the questionnaire.

repurchase. The average market value of firms that do not pay dividends and do not repurchase is CAD \$331.88 million (CAD \$83.99 million), versus CAD \$298.64 million (CAD \$70.49 million) for firms that only repurchase. Brennan and Thakor (1990) develop a theoretical model which predicts a relationship between the choice of the payout channel used to distribute funds and the size of the payout made.¹³ We find that the median amount of dividends is higher than the median amount spent in repurchases (CAD \$3.96 million vs. CAD \$0.74 million). By contrast, for repurchasing and dividend paying firms, the median amount spent in payout is much higher for both payout channels (CAD \$9.32 million = CAD \$5.81 million + CAD \$3.51 million). We also report in Table 3 the dividend yield as well as the repurchase yield. We find that the median dividend yield is higher than the median repurchase yield (1.70% vs. 1.18%), while the average payout yield for repurchasing and dividend paying firms is 2.68% (1.68% + 1.00%). Consistent with Brennan and Thakor (1990), we observe that the size of the payout is much larger for the dividend/repurchase channel than for the dividend-only or the repurchase-only channel. However, yield results do not differ significantly according to the payout channel: the size of the payout is relatively proportional to the firm size.

Non-operating income is somewhat higher among firms choosing dividends over repurchases. However, the standard deviation of ROA ($\sigma(ROA)$), a proxy for the stability of cash flows, is lower for dividend paying firms than for those that repurchase. The $\sigma(ROA)$ for dividend paying firms is 11.01%, while that for non-dividend paying firms (with no repurchase policy) and for firms that only repurchase is 49.33% and 17.96%, respectively. Jagannathan, Stephens and Weisbach (2000) find that firms choose

¹³ We thank an anonymous referee for mentioning this interesting point.

repurchases over dividends when there is a high likelihood that the cash flows being paid out are rare (i.e., when the value of financial flexibility is highest).

In line with Grullon and Michaely (2002), we find that firms that repurchase shares but do not pay dividends appear to have similar characteristics as firms that do not pay out any cash. These are small firms with high market-to-book ratios and high operating income volatility. In addition, we find that firms that pay dividends but do not repurchase shares are similar to those that pay dividends and repurchase shares.

According to Ikenberry, Lakonishok and Vermaelen (2000), once authorized, Canadian share repurchase programs last one year and are limited to the maximum of either 10 percent of public float or five percent of shares outstanding. Also, as documented by Morck (1995) the ownership structure of Canadian firms is more concentrated than in the U.S. and market capitalization and public float can differ significantly. As we do not have data on Canadian public float for a large sample of firms over 19 years, we only examine the repurchase program size relative to total shares outstanding (Table 4). Share repurchase programs between zero and 5% of shares outstanding represent more than 96% of our sample. More specifically, for 95.44% of firms, the repurchase program size relative to total shares outstanding is below 4.5%. Therefore, for the vast majority of non-financial Canadian repurchasing firms, the restrictions on the repurchase activity is not binding, and they have the choice to opt for the dividend channel (or both dividends and repurchases).¹⁴

***** Insert Table 4 about here *****

¹⁴ We thank an anonymous referee for mentioning this point.

To test whether Canadian share repurchase activity was constrained before the reduction in the capital gains inclusion rate, we divide the sample into the pre-reduction period (1985-2000) and the post-reduction period (2001-2003). Table 5 shows that after the reduction in the capital gains inclusion rate, the dollar amount distributed through repurchases relative to dividends increased from 55.02% to 74.29%. Moreover, before the reduction, the average annual expenditure on share repurchases was CAD \$8.15 million. After the reduction, the average annual expenditure on share repurchases was CAD \$11.61 million, representing an increase of 42.45% in the average annual expenditure. Other measures of share repurchase activity have similar increases. Overall, Table 5 shows that share repurchase activity in Canada increases after the reduction in the capital gains inclusion rate.

***** Insert Table 5 about here *****

Finally, to examine the clientele effect on share repurchase activity, we partition our sample into interlisted and solely Canadian-listed firms. Our hypothesis is that the interlisted firms, which take into account U.S. investor preferences, would favor capital gains over dividends, since the latter are taxed at a higher rate than the former in the U.S. The partitioned sample is shown in Table 6, and the interlisted firms are listed on the AMEX, on the NYSE, and on Nasdaq.

***** Insert Table 6 about here *****

Table 6 shows that the share repurchase activities of Canadian interlisted firms is higher than that of non-interlisted firms. For example, on average, the repurchase payout ratio is 17.50% and 7.46% for interlisted and non-interlisted firms, respectively. The difference in means between the two subsamples is significant at the 1% level. Other

measures of share repurchase activity confirm this observation. We also note that on average, the dollar amount distributed through dividends and share repurchases is respectively CAD \$26.65 million and CAD \$24.17 million, for interlisted firms, while it is respectively CAD \$5.54 million and CAD \$4.32 million, for non-interlisted firms.

Overall, our univariate comparisons suggest that differences exist between firm payouts depending on firm characteristics. These characteristics are, however, correlated. For example, the significant differences between interlisted vs. non-interlisted firms can be explained by the size and the trading history of interlisted firms. Hence, we examine these differences in a multivariate context.

4.3. Multivariate analysis of the choice between dividends and share repurchases

We estimate a model in which firm characteristics predict payout policy. Given that there are many potential payout methods, we consider multinomial probit¹⁵ regressions. More specifically, we consider models in which the probability of distributing cash, using dividends or conducting stock repurchases depends on a firm's characteristics. To formalize this, we suppose that the utility of choice j is:

$$U_j = \beta_j x_j' + \varepsilon_j; \quad j = 1, \dots, J; \quad [\varepsilon_1, \varepsilon_2, \dots, \varepsilon_J] \sim N[0, \Sigma] \quad (1)$$

where x_j is a vector of observed explanatory variables, β_j is a vector of regression coefficients, and Σ is the variance-covariance matrix. The term in the log-likelihood that corresponds to the choice of alternative q is:

$$\text{Prob}[\text{choice } q] = \text{Prob}[U_q > U_j, j=1, \dots, J, j \neq q] \quad (2)$$

The probability for this occurrence is:

$$\text{Prob}[\text{choice } q] = \text{Prob}[\varepsilon_1 - \varepsilon_q > (x_q - x_1)' \beta, \dots, \varepsilon_J - \varepsilon_q > (x_q - x_J)' \beta] \quad (3)$$

¹⁵ The multinomial probit model allows us to relax the independence of irrelevant alternatives (IIA) hypothesis, which is characteristic of the multinomial logistic model (see Greene 2003, section 21.7).

for the $J-1$ other choices.

We consider the following independent variables. $\text{Log}(MV)$ is the logarithm of the market value of equity. MB is the book value of the total assets plus the market value of equity minus the book value of equity, scaled by the book value of the total assets. ROA is the operating income before depreciation and amortization. $\sigma(ROA)$ is the standard deviation of ROA . $NOPER$ is the non-operating income before depreciation and amortization. $Interlisted$ is a dummy variable = 1 for interlisted firms, and 0 otherwise. $AFYear_{2000}$ is a dummy variable = 1 for years after 2000, and 0 otherwise. Table 7 provides estimates of a multinomial probit model predicting payout method choices.

***** Insert Table 7 about here *****

As we are principally interested in the choice between dividends and repurchases, we limit our analysis to four alternative methods of distributing cash flows (no payout, dividend only, repurchase only, dividend and repurchase), and focus on four different pairs of payout choices. The coefficients reported in Table 6 are estimates of the log odds between each retained pair.¹⁶

We first analyze the following alternative: dividend only versus no payout (model 1). The coefficients of market value and ROA are positive and significantly different from zero, while the coefficients of market-to-book ratio, $Interlisted$, and $AFYear_{2000}$ are negative and significantly different from zero. $\sigma(ROA)$ posts a negative, but insignificant coefficient at the 5% confidence level. These observations are consistent with the predictions of Lintner's (1956) model. In other words, dividend paying firms should be

¹⁶ The expected signs of coefficients follow our hypotheses in Section 3.2.

larger than non-dividend paying firms, and should have higher and more stable cash flows.

Next, we examine the second payout alternative, namely repurchase only versus no payout (model 2). Neither the market-to-book ratio nor non-operating income (at the 5% confidence level) explains a company's decision to repurchase shares rather than to not payout cash. However, the decision to repurchase shares is positively related to *ROA*, and negatively related to the market-to-book ratio. The coefficients of *Interlisted* and *AFYear₂₀₀₀* are positive, but insignificant at the 5% confidence level.

Ln(MV), *MB*, *Interlisted* and *AFYear₂₀₀₀* are significant for the third examined payout alternative, dividend only versus repurchase only (model 3). Specifically, this alternative predicts that a company's decision to pay dividends rather than to repurchase shares is positively related to size, and negatively related to market-to-book ratio, *Interlisted*, and *AFYear₂₀₀₀*. The fourth examined payout alternative, dividend and repurchase versus repurchase only (model 4), predicts that a company's decision to pay dividends and repurchase shares rather than to repurchase shares only is positively related to size, and negatively related to market-to-book ratio, *Interlisted* and *AFYear₂₀₀₀*.

Overall, our multivariate analysis confirms the univariate observations, and both support the evidence that dividends and repurchases are respectively used by different types of firms. For example, interlisted firms prefer share repurchases over dividends as a payout policy. We also confirm that the reduction in the capital gains inclusion rate in 2000 had a significant effect on the choice between dividends and share repurchases. We do not however find strong evidence of the financial flexibility hypothesis explaining the

choice between share repurchases and dividends, as suggested by Jagannathan, Stephens and Weisbach (2000).

4.4. Substitution hypothesis

Share repurchases could be thought of as substitutes for dividends. To test whether firms are substituting repurchases for dividends, we follow Grullon and Michaely (2002). We use the Lintner's (1956) model¹⁷ as a benchmark. We first calculate the dividend forecast errors, our dependent variable. To do so, we estimate the expected dividend payment for a firm based on its past dividends, and determine the dividend forecast errors as the difference between the actual and expected dividend payments. Then, we test our structural equation. We run a panel regression of the dividend forecast error on the share repurchase yield and control variables. If the coefficient of share repurchase yield is negative and significantly different from zero, we can conclude that firms are substituting repurchases for dividends. Alternatively, if the coefficient of share repurchase yield is positive and significant, we can conclude that dividends and repurchases are complementary payout methods.

We examine the relation between the dividend forecast error and the repurchase activity by using a sample of firms that have continuously paid dividends over a pre-forecast period (1985 to 1995). For each firm, the dividend forecast error is defined as:

$$ERROR_{t,i} = [\Delta DIV_{t,i} - (\beta_1 + \beta_2 EARN_{t,i} + \beta_3 DIV_{t-1,i})] / MV_{t-1,i} \quad (4)$$

¹⁷ Lintner (1956) shows that corporate managers approach dividend decisions with the idea that the level of dividend payments selected will become a fixed expense for the company in the foreseeable future. Managers are far more concerned with changing an established per-share dividend payment than they are with finding the theoretically "correct" level of dividend payout. Fama and Babiak (1968) undertake a comprehensive study of the Lintner model's performance, using data for 392 major industrial firms over the 1946 through 1964 period. They find that the Lintner (1956) model performs well, and that dividend payments track the course of corporate profits quite closely over time.

where $\Delta DIV_{t,i}$ is the actual change in dividends at time t , $EARN_{t,i}$ is the earnings at time t , $DIV_{t-1,i}$ is the dividend level at $t-1$, and $MV_{t-1,i}$ is the market value of equity at time $t-1$. The coefficients β_1 , β_2 , and β_3 are the parameters of the Lintner's (1956) model that have been estimated over the pre-forecast period (1985 to 1995), using a panel estimation. We find that the coefficient of earnings, $\hat{\beta}_2$, is 0.18. The coefficient of lagged dividends, $\hat{\beta}_3$, is -0.16 and the adjusted R^2 is 57.67%. We then examine the structural equation between the dividend forecast error ($ERROR$) and the share repurchase yield ($RYIELD$) over the post-forecast period (1996 to 2003) using a panel regression. Grullon and Michaely (2002) consider $RYIELD$ as an exogenous variable in the regressions explaining $ERROR$. However, the association between $ERROR$ and $RYIELD$ could be inferred incorrectly if $RYIELD$ is an endogenous variable. Further, we find from Table 6 that $Ln(MV)$, MB , $Interlisted$, and $AFYear2000$ variables are statistically significant determinants of the likelihood of dividend payout. Hence, restricting the analysis to only dividend paying firms could induce a sample selection problem (Heckman, 1979). To control for a potential sample selection bias and endogeneity, we follow three steps:¹⁸

First, we estimate a selection model (equation (5)) on the population via a Probit model and compute the inverse Mills ratio (IMR):

$$\begin{aligned} \text{Probit } (Dividends)_{t,i} = & \alpha_0 + \alpha_1 \text{Log}(MV)_{t,i} + \alpha_2 ROA_{t,i} + \alpha_3 \sigma(ROA)_{t,i} + \alpha_4 NOPER_{t,i} \\ & + \alpha_5 MB_{t,i} + \alpha_6 Interlisted_{t,i} + \gamma_7 AFYear_{2000,i} + \varepsilon_i \end{aligned} \quad (5)$$

The panel regression is estimated for the whole population. $Dividends = 1$ for dividend paying firms and 0 otherwise.

¹⁸ We are indebted to an anonymous referee for this valuable remark.

Second, we estimate a reduced form equation on the population as well (equation (6)) through a Tobit model to tackle the endogeneity problem.

$$\begin{aligned} \text{Tobit } (RYIELD)_{t,i} = & \gamma_0 + \gamma_1 RYIELD_{t-1,i} + \gamma_2 \text{Log}(MV)_{t,i} + \gamma_3 ROA_{t,i} + \gamma_4 \sigma(ROA)_{t,i} \\ & + \gamma_5 NOPER_{t,i} + \gamma_6 MB_{t,i} + \gamma_7 \text{Interlisted}_{t,i} + \gamma_8 AFYear_{2000,i} + \varepsilon_i \end{aligned} \quad (6)$$

The potentially endogenous variable is regressed on one instrument variable (lagged *RYIELD*)¹⁹ and control variables used in the first step.

Third, we estimate the structural equation for the subsample of dividend paying firms over the post-forecast period (1996-2003). We regress the dividend forecast error (*ERROR*) on the predicted values of the endogenous variable (*RYIELD*) from equation (6), the inverse Mills ratio (*IMR*) from equation (5), and control variables.

$$\begin{aligned} ERROR_{t,i} = & \alpha_0 + \alpha_1 (RYIELD \text{ predicted})_{t,i} + \alpha_2 \text{Log}(MV)_{t,i} + \alpha_3 ROA_{t,i} + \alpha_4 \sigma(ROA)_{t,i} \\ & + \alpha_5 NOPER_{t,i} + \alpha_6 MB_{t,i} + \alpha_7 \text{Interlisted}_{t,i} + \alpha_8 AFYear_{2000,i} + \alpha_9 IMR_{t,i} + \varepsilon_i \end{aligned} \quad (7)$$

Note that if a selection bias is present, the *IMR* will have a significant coefficient. Table 8 reports the results for each step. Columns, 1, 2, and 3 of Table 8 report results for the selection equation. Columns 4, 5, and 6 report results for the reduced form equation and columns 7, 8, and 9 report results for the structural equation. We find that the inverse Mills ratio coefficient is significant in regression (7), which indicates the presence of a sample selection bias. The Hausman test²⁰ also reveals there is an endogeneity problem. More importantly, we find the coefficient of *RYIELD* is equal to -0.1589, and is significantly different from zero at the 10% confidence level. Thus, we confirm that

¹⁹ Considering other instruments (for example, *EARN/MV* and Lagged *RYIELD*) does not alter our conclusions.

²⁰ See Larcker and Rusticus (2006).

dividend paying Canadian firms have been substituting share repurchases for dividends after controlling for selection bias and endogeneity.

***** Insert Table 8 about here *****

5. Conclusion

In recent years, the amount of money spent on corporate stock repurchases has increased steadily in the U.S., as has the number of companies engaged in share repurchase programs. The “new” payout trend is apparent worldwide as many countries have recently come to allow firms to repurchase stock. In this paper, we provide out-of-sample evidence by focusing on the payout policy in Canada during the 1985-2003 period.

First, we examine the evolution of the payout policy of non-financial Canadian firms. We show that share repurchases in Canada have become a popular payout method among firms initiating cash distributions to their equity holders. When we rank dividend paying and share repurchasing firms by total dividends, share repurchases, and earnings in deciles, we find that the overwhelming majority of aggregate dividends and share repurchases are paid by a low proportion of firms, and that this concentration increases substantially over the 1985-2003 period.

Second, we focus on the factors that could affect the choice between repurchases and dividends. We find that firms that repurchase shares but do not pay dividends appear to have similar characteristics as firms that do not pay out any cash. These are small firms with high market-to-book ratios and high earnings volatility. In addition, we find that firms that pay dividends but do not repurchase shares are similar to those that pay

dividends and repurchase shares. Using a multinomial probit model, we find that the decision to repurchase shares is positively related to return on assets, and negatively related to the market-to-book ratio. We also find that the reduction in the capital gains inclusion rate and whether or not the firm is interlisted account for the choice between dividends and share repurchases. However, we do not retain the flexibility inherent in repurchase programs as a reason why they are sometimes used instead of dividends.

We also find as does Grullon and Michaely (2002) in the U.S., that dividend paying Canadian firms have been substituting share repurchases for dividends after controlling for selection bias and endogeneity. Although we find some explanations for the choice between dividends and share repurchases in Canada, the issues raised and the complex nature of payout policy call for further analysis.

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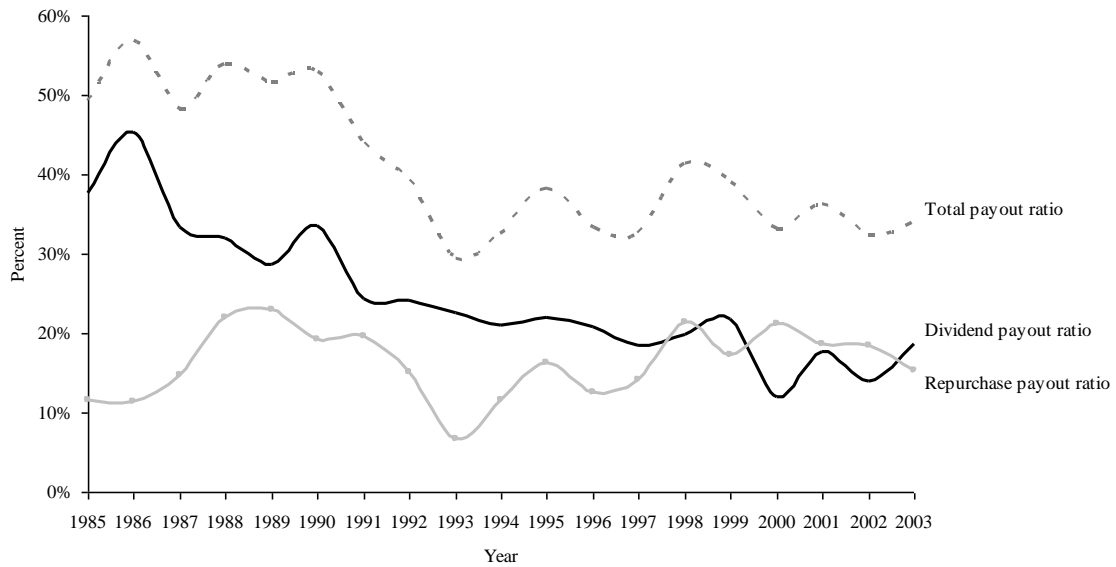


Figure 1
Cash distributions to equityholders

This figure presents the equally-weighted average total payout ratio, dividend payout ratio, and repurchase payout ratio for a sample of Canadian firms. The data consist of all the firm-year observations on Compustat over the 1985-2003 period which contain information on the following variables: *REPO*, *DIV*, *EARN*, and *MV*. *REPO* is the expenditure on the purchase of common and preferred stocks minus any reduction in the value (redemption value) of the net number of preferred shares outstanding. *DIV* is the total dollar amount of dividends declared on the common stock. *EARN* is the earnings before extraordinary items. *MV* is the market value of common stock. The sample used in this analysis only includes firms with positive earnings. Following Grullon and Michaely (2002), we eliminate observations with total payout ratios greater than one in order to mitigate the effect of outliers. The data contain 4,472 firm-year observations and exclude banks, utility, and insurance companies.

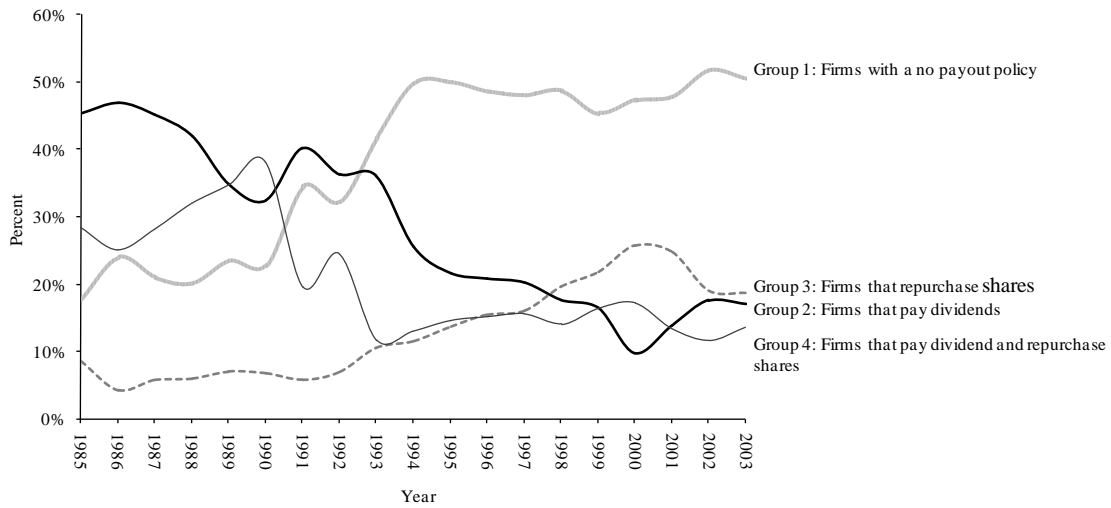


Figure 2
The proportion of Canadian firms in different groups

This figure presents the proportion of Canadian firms in different payout groups: (1) firms with a no payout policy, (2) firms that pay dividends, (3) firms that repurchase shares, and (4) firms that pay dividends and repurchase shares. The data consist of all the firm-year observations on Compustat over the 1985-2003 period, which contain information on the following variables: *REPO*, *DIV*, *EARN*, and *MV*. *REPO* is the expenditure on the purchase of common and preferred stocks minus any reduction in the value (redemption value) of the net number of preferred shares outstanding. *DIV* is the total dollar amount of dividends declared on the common stock. *EARN* is the earnings before extraordinary items. *MV* is the market value of common stock. The data contain 4,472 firm-year observations, exclude banks, utility, and insurance companies, and only include firms with positive earnings.

Table 1
Aggregate cash distributions to equityholders

This table reports annual information on aggregate cash distributions to equityholders for a sample of Canadian firms. The data consist of all firm-year observations on Compustat over the 1985-2003 period, which contain information on the following variables: *REPO*, *DIV*, *EARN*, and *MV*. *REPO* is the expenditure on the purchase of common and preferred stocks minus any reduction in the value (redemption value) of the net number of preferred shares outstanding. *DIV* is the total dollar amount of dividends declared on the common stock. *EARN* is the earnings before extraordinary items. *MV* is the market value of common stock. The data include 4,472 firm-year observations and exclude banks, utility, and insurance companies. Σi represents the aggregation of data by calendar year. $\Sigma iEARN$, $\Sigma iDIV$, and $\Sigma iREPO$ are expressed in millions of Canadian dollars.

Year	$\Sigma iEARN$	$\Sigma iDIV$	$\Sigma iREPO$	Dividend payout ratio	Repurchase payout ratio	$(\Sigma iDIV + \Sigma iREPO) / \Sigma iMV$	$\Sigma iDIV / \Sigma iMV$	$\Sigma iREPO / \Sigma iMV$	$\Sigma iREPO / \Sigma iDIV$
1985	3,692.15	1,391.45	429.01	37.69%	11.62%	4.93%	3.77%	1.16%	30.83%
1986	3,486.26	1,581.68	399.33	45.37%	11.45%	4.55%	3.63%	0.92%	25.25%
1987	5,444.04	1,816.82	805.35	33.37%	14.79%	5.10%	3.53%	1.57%	44.33%
1988	6,896.35	2,204.33	1,517.21	31.96%	22.00%	5.24%	3.10%	2.14%	68.83%
1989	6,938.34	1,987.34	1,596.14	28.64%	23.00%	4.09%	2.27%	1.82%	80.32%
1990	5,138.36	1,727.71	989.26	33.62%	19.25%	3.74%	2.38%	1.36%	57.26%
1991	2,192.17	534.67	428.71	24.39%	19.56%	2.31%	1.28%	1.03%	80.18%
1992	3,440.49	828.39	518.75	24.08%	15.08%	2.14%	1.31%	0.82%	62.62%
1993	3,630.32	820.83	245.52	22.61%	6.76%	1.19%	0.92%	0.27%	29.91%
1994	10,148.37	2,121.82	1,180.56	20.91%	11.63%	2.16%	1.39%	0.77%	55.64%
1995	13,214.04	2,895.26	2,162.01	21.91%	16.36%	2.57%	1.47%	1.10%	74.67%
1996	12,477.90	2,594.54	1,563.27	20.79%	12.53%	1.85%	1.16%	0.70%	60.25%
1997	12,565.74	2,323.32	1,766.21	18.49%	14.06%	1.97%	1.12%	0.85%	76.02%
1998	19,937.52	3,962.82	4,275.61	19.88%	21.45%	3.31%	1.59%	1.72%	107.89%
1999	22,353.26	4,868.06	3,857.31	21.78%	17.26%	2.40%	1.34%	1.06%	79.24%
2000	25,711.20	3,061.04	5,450.02	11.91%	21.20%	2.70%	0.97%	1.73%	178.04%
2001	18,473.33	3,260.61	3,453.56	17.65%	18.69%	2.38%	1.16%	1.23%	105.92%
2002	33,180.92	4,620.14	6,123.66	13.92%	18.46%	2.52%	1.08%	1.43%	132.54%
2003	21,672.00	4,051.27	3,318.05	18.69%	15.31%	2.16%	1.19%	0.97%	81.90%

Table 2

Concentration of total dollar dividends, share repurchases and earnings for Canadian firms in 1985 and 2003

The data include 4,472 firm-year observations and exclude banks, utility, and insurance companies. First, firms are ranked from the largest to smallest decile total dollar dividends paid in each year (per Compustat). Columns 2, 3 and 4 report, for the dividend firm deciles, the total dividends, the proportion of dividends and the percent of earnings, respectively. Second, firms are ranked from the largest to smallest decile total share dollar share repurchases in each year (per Compustat). Columns 6, 7 and 8 report, for the share repurchase firm deciles, the total share repurchases, the proportion of share repurchases and the proportion of earnings, respectively. Share repurchases are the expenditure on the purchase of common and preferred stocks minus any reduction in the value (redemption value) of the net number of preferred shares outstanding. Dividends are the total dollar amount of dividends declared on the common stock. Earnings are the earnings before extraordinary items. Dividends, share repurchases and earnings are expressed in millions of Canadian dollars. The sample used in this analysis only includes firms with positive earnings. Following Grullon and Michaely (2002), we eliminate observations with total payout ratios greater than one in order to mitigate the effect of outliers.

Dividend ranking	Dividends (\$ million)		Percent of total dividends (%)		Percent of total earnings (%)		Share repurchase ranking	Share repurchases (\$ million)		Percent of share repurchases (%)		Percent of total earnings (%)	
	1985	2003	1985	2003	1985	2003		1985	2003	1985	2003	1985	2003
Largest 10%	1,121.62	3,714.5	80.61	91.69	68.86	88.37	Largest 10%	396.05	3,234.3	92.32	97.48	87.19	83.12
0.2	199.32	222.48	14.32	5.49	24.08	7.56	0.2	26.58	69.12	6.20	2.08	7.55	10.71
0.3	45.77	92.26	3.29	2.28	4.05	3.25	0.3	6.24	14.26	1.45	0.43	4.51	5.21
0.4	24.74	22.04	1.78	0.54	3.01	0.82	0.4	0.14	0.368	0.03	0.01	0.74	0.96
0.5							0.5						
0.6							0.6						
0.7							0.7						
0.8							0.8						
0.9							0.9						
Smallest 10%							Smallest 10%						
Total	1,391.45	4,051.27	100	100	100	100	Total	429.01	3,318.05	100	100	100	100

Table 3

Firm characteristics by payout policy

This table reports descriptive statistics by payout policy for a sample of Canadian firms. We determine the payout policy of a firm by observing its cash disbursements each year. The data consist of all firm-year observations on Compustat over the 1985-2003 period, which contain information on the following variables: *REPO*, *DIV*, *EARN*, and *MV*. *REPO* is the expenditure on the purchase of common and preferred stocks minus any reduction in the value (redemption value) of the net number of preferred shares outstanding. *DIV* is the total dollar amount of dividends declared on the common stock. *EARN* is the earnings before extraordinary items. *MV* is the market value of common stock. *ASSETS* is the book value of assets. The data include 4,472 firm-year observations and exclude banks, utility, and insurance companies. *ROA* is the operating income before depreciation and amortization scaled by the book value of the total assets. $\sigma(ROA)$ is the standard deviation of *ROA*. $\sigma(ROA)$ is calculated over the same time periods used to determine the payout policy of a firm. *NOPER* is the non-operating income before depreciation and amortization scaled by the book value of the total assets. *MB* is equal to the book value of the total assets plus the market value of equity minus the book value of equity scaled by the book value of the total assets. *DIV/TOTAL* is the total amount of dividends in each group scaled by the aggregate amount of dividends. *REPO/TOTAL* is the total amount of share repurchases in each group scaled by the aggregate amount of share repurchases.

	<i>DIV</i> = 0, <i>REPO</i> = 0		<i>DIV</i> > 0, <i>REPO</i> = 0	
	% observations: 43.96		% observations: 22.58	
<i>DIV/TOTAL</i>	0%		42.87%	
<i>REPO/TOTAL</i>	0%		0%	
Variable	Mean	Median	Mean	Median
<i>MV</i>	331.88	83.99	1 003.56	267.53
<i>ASSETS</i>	357.14	86.36	1 319.37	285.48
<i>MB</i>	2.32	1.76	2.06	1.67
<i>ROA</i>	-30.47%	13.41%	16.32%	14.25%
$\sigma(ROA)$	49.33%	5.71%	11.01%	5.12%
<i>NOPER</i>	2.57%	0.15%	1.25%	0.52%
<i>DIV</i>	0	0	19.8	3.96
<i>REPO</i>	0	0	0	0
<i>DIV/MV</i>	0	0	3.00%	1.70%
<i>REPO/MV</i>	0	0	0	0
	<i>DIV</i> = 0, <i>REPO</i> > 0		<i>DIV</i> > 0, <i>REPO</i> > 0	
	% observations: 16.32		% observations: 17.13	
<i>DIV/TOTAL</i>	0%		57.13%	
<i>REPO/TOTAL</i>	18.19%		81.81%	
Variable	Mean	Median	Mean	Median
<i>MV</i>	298.64	70.49	2 052.21	383.66
<i>ASSETS</i>	375.81	98.77	2 711.18	572.05
<i>MB</i>	1.90	1.50	1.86	1.61
<i>ROA</i>	16.90%	15.39%	15.71%	15.02%
$\sigma(ROA)$	17.96%	5.40%	12.01%	4.79%
<i>NOPER</i>	1.20%	0.16%	0.88%	0.41%
<i>DIV</i>	0	0	34.79	5.81
<i>REPO</i>	9.98	0.74	42.80	3.51
<i>DIV/MV</i>	0	0	2.20%	1.68%
<i>REPO/MV</i>	2.78%	1.18%	2.25%	1.00%

Table 4

Share repurchases by program size.

This table reports the number of share repurchases in our sample of Canadian firms (in percentage) by program size. The data include 4,472 firm-year observations on Compustat over the 1985-2003 period and exclude banks, utility, and insurance companies.

Repurchase program size	Number (%)
Less than 4.5%	95.44%
4.5% to 4.99%	0.62%
5% to 5.49%	0.71%
More than 5.49%	3.23%
All	100.00%

Table 5

The effect of the reduction in the capital gains inclusion rate in Canada (October 17, 2000) on share repurchase activity

The data include 4,472 firm-year observations on Compustat over the 1985-2003 period, which contain information on the following variables: *REPO*, *DIV*, *EARN*, and *MV*. *REPO* is the expenditure on the purchase of common and preferred stocks minus any reduction in the value (redemption value) of the net number of preferred shares outstanding. *DIV* is the total dollar amount of dividends declared on the common stock. *EARN* is the earnings before extraordinary items. *MV* is the market value of common stock. Σ_i represents the aggregation of data by calendar year. $\Sigma_i DIV$, and $\Sigma_i REPO$ are expressed in millions of Canadian dollars. The sample used in this analysis only includes firms with positive earnings. Following Grullon and Michaely (2002), we eliminate observations with total payout ratios greater than one in order to mitigate the effect of outliers.

Variable (mean)	Pre-reduction period (1985-2000)	Post-reduction period (2001-2003)	Entire Sample
$\Sigma_i[REPO/DIV]$	55.02%	74.29%	58.52%
$\Sigma_i[REPO/EARN]$	9.56%	10.62%	9.82%
$\Sigma_i[REPO/MV]$	0.84%	0.93%	0.86%
$\Sigma_i REPO$ (millions of Canadian dollars)	8.15	11.61	9.01
$\Sigma_i DIV$ (millions of Canadian dollars)	10.43	10.80	10.52
<i>Number of observations</i>	3,352	1,120	4,472

Table 6
Share repurchase activity in Canada and the clientele effect

This table examines the clientele effect on several measures of share repurchase activity. We partitioned our sample into solely Canadian-listed firms and interlisted firms which were traded on exchanges in both the U.S. and Canada. The data include 4,472 firm-year observations on Compustat over the 1985-2003 period, which contain information on the following variables: *REPO*, *DIV*, *EARN*, and *MV*. *REPO* is the expenditure on the purchase of common and preferred stocks minus any reduction in the value (redemption value) of the net number of preferred shares outstanding. *DIV* is the total dollar amount of dividends declared on the common stock. *EARN* is the earnings before extraordinary items. *MV* is the market value of common stock. Σ_i represents the aggregation of data by calendar year. $\Sigma_i DIV$, and $\Sigma_i REPO$ are expressed in millions of Canadian dollars. The sample used in this analysis only includes firms with positive earnings. Following Grullon and Michaely (2002), we eliminate observations with total payout ratios greater than one in order to mitigate the effect of outliers. We also test the differences in means between interlisted and non-interlisted firms.

Variable (mean)	Non-interlisted firms	Interlisted firms	Entire sample
$\Sigma_i[REPO/DIV]$	57.00%	62.92%	58.52%
$\Sigma_i[REPO/EARN]$	7.46%	17.50%***	9.82%
$\Sigma_i[REPO/MV]$	0.85%	0.89%	0.86%
$\Sigma_i REPO$ (millions of Canadian dollars)	4.32	24.17***	9.01
$\Sigma_i DIV$ (millions of Canadian dollars)	5.54	26.65***	10.52
<i>Number of observations</i>	3,417	1,055	4,472

***Indicates statistical significance at the 0.01 level.

Table 7

Firm characteristics affecting a firm's choice of payout method

This table presents the results of the estimation of a multinomial probit model of various firm characteristics which predicts the alternative methods chosen by firms to distribute cash flows in a given year. The data include 4,472 firm-year observations on Compustat over the 1985-2003 period. Each column of the table provides the parameter estimates obtained from the log odds ratios. The first column compares firms paying dividends (*DIV*) to firms with a no payout (*NP*). The second column compares firms purchasing shares (*REPO*) to firms with a no payout (*NP*). The third column compares firms paying dividends (*DIV*) to firms purchasing shares (*REPO*). The fourth column compares firms paying dividends and purchasing shares (*DIV +REPO*) to firms purchasing only shares (*REPO*). *MV* is the market value of common stock. *MB* is equal to the book value of the total assets plus the market value of equity minus the book value of equity scaled by the book value of the total assets. *ROA* is the operating income before depreciation and amortization scaled by the book value of the total assets. $\sigma(ROA)$ is the standard deviation of *ROA*. *NOPER* is the non-operating income before depreciation and amortization scaled by the book value of the total assets. *Interlisted* is a dummy variable = 1 for interlisted firms, and 0 otherwise. *AFYear₂₀₀₀* is a dummy variable = 1 for years after 2000 and 0 otherwise. *p*-values are calculated using panel-adjusted standard errors.

Independent variable	Model 1		Model 2		Model 3		Model 4	
	$Log(P_{DIV}/P_{NP})$		$Log(P_{REPO}/P_{NP})$		$Log(P_{DIV}/P_{REPO})$		$Log(P_{DIV+REPO}/P_{REPO})$	
	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value
<i>Ln(MV)</i>	0.390***	0.000	0.004	0.899	0.385***	0.000	0.526***	0.000
<i>ROA</i>	0.795*	0.090	0.819	0.133	-0.024	0.960	-0.621	0.277
$\sigma(ROA)$	-0.029	0.606	0.046	0.199	-0.075	0.156	-0.041	0.417
<i>NOPER</i>	1.427	0.249	0.348	0.744	1.079	0.408	-1.985	0.254
<i>MB</i>	-0.051**	0.027	-0.025	0.176	-0.025*	0.076	-0.055***	0.002
<i>Interlisted</i>	-0.456**	0.013	0.011	0.938	-0.445**	0.021	-0.799***	0.000
<i>AFYear₂₀₀₀</i>	-0.646***	0.000	0.003	0.976	-0.643***	0.000	-0.682***	0.000
<i>Intercept</i>	-2.193***	0.000	-0.793***	0.000	-1.400***	0.000	-2.111***	0.000

***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively.

Table 8

Panel regressions after controlling for endogeneity and selection bias

We estimate a selection equation via a Probit model and a reduced form equation through a Tobit model on the population (4,472 firm-year observations over the 1985-2003 period).

Selection equation:

$$\text{Probit } (Dividends)_{t,i} = \alpha_0 + \alpha_1 \text{Log}(MV)_{t,i} + \alpha_2 \text{ROA}_{t,i} + \alpha_3 \sigma(\text{ROA})_{t,i} + \alpha_4 \text{NOPER}_{t,i} \\ + \alpha_5 \text{MB}_{t,i} + \alpha_6 \text{Interlisted}_{t,i} + \gamma_7 \text{AFYear}_{2000,i} + \varepsilon_i$$

Reduced form equation:

$$\text{Tobit } (RYIELD)_{t,i} = \gamma_0 + \gamma_1 \text{RYIELD}_{t-1,i} + \gamma_2 \text{Log}(MV)_{t,i} + \gamma_3 \text{ROA}_{t,i} \\ + \gamma_4 \sigma(\text{ROA})_{t,i} + \gamma_5 \text{NOPER}_{t,i} + \gamma_6 \text{MB}_{t,i} + \gamma_7 \text{Interlisted}_{t,i} + \gamma_8 \text{AFYear}_{2000,i} + \varepsilon_i$$

We estimate the structural equation for the subsample of dividend paying firms over the post-forecast period (1996-2003):

$$\text{ERROR}_{t,i} = \alpha_0 + \alpha_1 (\text{RYIELD predicted})_{t,i} + \alpha_2 \text{Log}(MV)_{t,i} + \alpha_3 \text{ROA}_{t,i} + \alpha_4 \sigma(\text{ROA})_{t,i} + \alpha_5 \text{NOPER}_{t,i} + \alpha_6 \text{MB}_{t,i} \\ + \alpha_7 \text{Interlisted}_{t,i} + \alpha_8 \text{AFYear}_{2000,i} + \alpha_9 \text{IMR}_{t,i} + \varepsilon_i$$

We also define the dividend forecast error as: $\text{ERROR}_{t,i} = [\Delta \text{DIV}_{t,i} - (\beta_1 + \beta_2 \text{EARN}_{t,i} + \beta_3 \text{DIV}_{t-1,i})] / \text{MV}_{t-1,i}$ where $\Delta \text{DIV}_{t,i}$ is the actual change in dividends at time t , $\text{EARN}_{t,i}$ is the earnings at time t , $\text{DIV}_{t-1,i}$ is the dividend level at $t-1$, and $\text{MV}_{t-1,i}$ is the market value of equity at time $t-1$. The coefficients β_1 , β_2 , and β_3 are the parameters of the Lintner (1956) model that have been estimated over a pre-forecast period (1985-1995) using a panel regression. To be included in the sample, each firm must have paid dividends continuously over the entire pre-forecast period. RYIELD is the total expenditure on share repurchases at time t scaled by the market value of equity at time $t-1$. $\text{Log}(MV)$ is the logarithm of the market value of equity. ROA is the operating income before depreciation and amortization scaled by the book value of the total assets. $\sigma(\text{ROA})$ is the standard deviation of ROA over the three years surrounding the firm-year observation. NOPER is the non-operating income before depreciation and amortization scaled by the book value of the total assets. MB is equal to the book value of the total assets plus the market value of equity minus the book value of equity scaled by the book value of the total assets. Interlisted is a dummy variable = 1 for interlisted firms, and 0 otherwise. AFYear_{2000} is a dummy variable = 1 for years after 2000 and 0 otherwise. $\text{Dividends} = 1$ for dividend paying firms and 0 otherwise. IMR = inverse Mills ratio. RYIELD predicted is the predicted value of the endogenous variable (RYIELD) from the reduced form equation (tobit model). It is computed as $E[y_i | X_i] = \Phi\left(\frac{X_i \beta}{\sigma}\right) (X_i \beta + \sigma \frac{\Phi(X_i \beta / \sigma)}{\phi(X_i \beta / \sigma)})$ (see Greene 2003, p. 764).

	Selection equation		Reduced form equation			Structural equation		
	Coef.	p-value ^a	Coef.	p-value ^a	Coef.	p-value ^a	p-value ^a	
<i>Log(MV)</i>	0.4156***	0.0000	<i>RYIELD</i> _{t-1}	0.5697***	0.0000	<i>RYIELD pred.</i>	-0.1589*	0.0570
<i>ROA</i>	0.4394**	0.0480	<i>Log(MV)</i>	-0.0004	0.3040	<i>Log(MV)</i>	-0.0163***	0.0010
$\sigma(\text{ROA})$	-0.0192	0.5510	<i>ROA</i>	0.0019	0.1880	<i>ROA</i>	-0.0279	0.2780
<i>NOPER</i>	-0.3330	0.6370	$\sigma(\text{ROA})$	0.0016*	0.0970	$\sigma(\text{ROA})$	0.0080*	0.0510
<i>MB</i>	0.0514***	0.0000	<i>NOPER</i>	0.0094	0.5570	<i>NOPER</i>	0.1518**	0.0190
<i>Interlisted</i>	0.6185***	0.0000	<i>MB</i>	-0.0005**	0.0390	<i>MB</i>	0.0038**	0.0210
<i>AFYear</i> ₂₀₀₀	0.8470***	0.0090	<i>Interlisted</i>	0.0012	0.4630	<i>Interlisted</i>	0.0721***	0.0000
Intercept	1.7560***	0.0000	<i>AFYear</i> ₂₀₀₀	-0.0001	0.9270	<i>AFYear</i> ₂₀₀₀	0.0809***	0.0000
			Intercept	0.0062***	0.0030	Intercept	-0.2282***	0.0000
						<i>IMR</i>	0.1292***	0.0010
						Hausman test ^b		0.0000

^a ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively.

^b The p-value in the Hausman test indicates whether or not we reject the presence of an endogeneity problem.