Who Repurchases Shares in Major Countries?: Evidence of Excess Cash Hypothesis

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Abstract

In this study, we examine the patterns and determinants of share repurchases using firm-level data from seven major countries—Australia, Canada, France, Germany, Japan, the U.K., and the U.S.—over the period 2000-2005. We find that non-U.S. firms do not repurchase shares as much as U.S. firms do. However, it appears that a common set of patterns applies to the payout behavior of both U.S. and non-U.S. firms. For example, across countries, firms use share repurchases as a flexible means of distributing cash. Also, firms generally do not use repurchases as a substitute for dividends. Further, there is strong evidence that, across countries, repurchasing firms have unique characteristics, depending on whether or not they also pay dividends. Finally, our multinomial logit and Tobit regressions show that, across countries, excess cash is a key determinant of share repurchases.

JEL Classification: G35, G15

Keywords: share repurchase, dividends, international evidence, corporate payout policy

May 2008

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1. Introduction

Both the financial press and academic studies report that share repurchases now replaced dividends as the most important payout method in the U.S. Prior research documents that U.S. firms use share repurchases to distribute temporary income, whereas they use dividends to distribute permanent income [Jagannathan, Stephens and Weisbach (2000), Guay and Harford (2000), and Lee and Rui (2007)]. In contrast, extant knowledge is limited with respect to the extent and motivations of share repurchases by firms outside of the U.S. Systematic academic studies of share repurchases by firms outside of the U.S. are rare.

In this paper, we attempt to fill this research gap and expand the present knowledge of corporate payout policy. Specifically, using international data, we examine the patterns of share repurchases across countries and attempt to uncover the forces that motivate a firm's choice of payout method. Firms outside of the U.S. operate in different economic and institutional environments. Thus, an examination of international data allows us to test the robustness of the patterns that are identified for U.S. firms. Our international investigation, however, extends beyond simply checking the robustness of the patterns found for U.S. firms. We attempt to unveil factors that prior U.S. studies do not pay much attention to, but that affect a firm's decision to repurchase shares.

Our dataset comprises firms from seven major countries—Australia, Canada, France, Germany, Japan, the U.K. and the U.S.—over the period 2000–2005. These countries are chosen because they offer the largest stock markets among developed countries. Our empirical analysis begins by documenting and comparing the relative use of share repurchases among firms across countries. We then explore the nature of repurchases—as opposed to dividends—as a payout method by examining the stability of payout policy. In doing so, we divide a firm's payout policy into four types: one that makes no distributions, one that uses only dividends, one that uses only share repurchases, and one that uses both dividends and share repurchases. We also examine the question of whether firms use share repurchases as a substitute for dividends. Finally, we analyze the factors that affect a firm's decision as to whether or not and how much to repurchase by examining the firm-level characteristics associated with share repurchases.

Our key findings can be summarized as follows. First, in countries outside of the U.S., share repurchases are not as widely used as they are in the U.S. It appears that dividends remain as the primary payout method for non-U.S. firms. The percentage of non-U.S. firms that use share repurchases, either solely or in conjunction with dividends, is relatively small. In addition, the amount of cash distributed through share repurchases is substantially less than the amount of cash distributed through dividends for non-U.S. firms. Furthermore, when non-U.S. firms initiate cash distribution, they are more likely to do so through dividends than through share repurchases.

On the other hand, we find that there is a common set of principles that govern a firm's

decision to make repurchases, even though the extent of the use of repurchases may vary across countries. For example, in all countries studied, the likelihood that a repurchasing firm continues to makes repurchases in the subsequent year is very low, while the likelihood that a dividend-paying firm continues to pay dividends in the subsequent year is high. This observation is consistent with the conventional wisdom of prior U.S. studies that share repurchases are flexible, while dividends are sticky. [See, for example, Jagannathan *et al*. (2000) and Grullon and Michaely (2002).]

Furthermore, across countries, firms generally do not switch from one payout method to the other. That is, it is rare for firms that only repurchase shares to adopt dividends as their sole payout method in the subsequent year. Likewise, it is rare for firms that use dividends, either solely or in conjunction with repurchases, to adopt repurchases as their sole payout method in the subsequent year. This lack of switching between the two payout methods suggests that repurchases and dividends may not be perfect substitutes.

Our analysis also shows that in all countries including the U.S., the majority of share repurchases coincide with dividend increases. In other words, when firms repurchase shares, they tend to increase dividends in the same year. This observation suggests that, in general, firms do not use share repurchases as a substitute for dividends in the sense that they do not finance repurchases by reducing dividends. This observation is generally consistent with prior U.S. studies, such as those of Dittmar (2000), Jagannathan *et al*. (2000), and Lee and Rui (2007). On the other hand, we also find that in all countries, repurchasing firms are less likely to increase dividends than non-repurchasing firms. This observation is generally consistent with the findings of Grullon and Michaely (2002) and Lee and Rui (2007) because it indicates that firms repurchase shares using the same funds that might have been used to increase dividends.

Next, when we examine firm characteristics associated with a firm's decision to repurchase shares, our findings strongly indicate that, across countries, repurchasing firms can be divided into two distinct groups, depending on whether or not they also pay dividends. Across countries, repurchasing firms that do not pay dividends have similar firm characteristics to those that make no payouts, while repurchasing firms that pay dividends have similar firm characteristics to those that only pay dividends. Specifically, repurchasing firms that do not pay dividends are smaller, less profitable, at a relatively earlier stage of financing life cycle, and experience higher profit volatility, as compared to repurchasing firms that pay dividends.

According to our multinomial logit regressions, both groups of repurchasing firms have several firm characteristics that set them apart from dividend-paying firms. Across countries, repurchasing firms that do not pay dividends are smaller, have larger cash holdings, are less profitable, are at an earlier stage of financial life cycle, and experience high profit volatilities, as compared to firms that only pay dividends. On the other hand, across countries, repurchasing firms that pay dividends are larger in firm size and have larger cash holdings, as compared to

firms that only pay dividends.[1]

More importantly, the multinomial logit regressions provide strong evidence that supports excess cash hypothesis. Across countries, both groups of repurchasing firms (i.e., those that pay dividends and those that do not) share a common firm characteristic—large cash holdings—that distinguishes them from firms that only pay dividends. This observation suggests that firms repurchase shares to distribute excess cash. Our Tobit regressions provide further support for the hypothesis that excess cash is a key determinant of share repurchases. Across countries, cash holdings have a positive and significant impact on the amount of repurchases for both groups of repurchasing firms. Furthermore, when we examine the innovation of cash holdings over time, we find that firms that initiate repurchases experience a substantial increase in cash holdings within three to four years before their repurchases, while firms that increase dividends do not experience a similar increase in cash holdings. These findings add to the evidence that excess cash may be a key factor that motivates firms to repurchase shares.

Overall, our results suggest that firms repurchase shares to distribute excess cash, but it is necessary to distinguish between two groups of repurchasing firms. It appears that repurchasing firms that do not pay dividends rely solely on repurchases to distribute excess cash, because their low and volatile profitability make it difficult for them to pay dividends—which is sticky. Repurchasing firms that pay dividends also use repurchases to distribute excess cash, while continuing to pay dividends out of permanent income.

Using international data, our study sheds light on the forces that affect a firm's decision to repurchase shares. Our contribution to the payout literature is four-fold. First, while several prior studies offer some evidence on dividends outside of the U.S. [See, for example, Dewenter and Warther (1998), Amihud and Murgia (1997), La Porta *et al*. (2000), Denis and Osobov (2007)], the present study is one of few studies to document comprehensive evidence on the use of repurchases outside of the U.S.[2]

Second, we show that many of the patterns of share repurchases by non-U.S. firms are consistent with those reported by prior U.S. studies. For example, across countries, repurchases are used flexibly, while dividends are sticky. Also, firms generally do not use repurchases as a substitute for dividends. Thus, our international study adds robustness to these results of prior U.S. studies.

Third, unlike many prior U.S. studies, the present study points out that there are two distinct groups of repurchasing firms: those that pay dividends and those that do not pay

[1] This is in contrast to the U.S. study of Grullon and Michaely (2002), where the authors argue that "conditioning on a firm paying dividends, there is *no* difference between firms that do or do not repurchase shares." We find that, across countries, dividend-paying firms have different firm characteristics—firm size and cash holdings—depending on whether or not they also repurchase shares.

[2] Von Eije and Megginson's (2007) study is among the few international studies on the use of repurchases, wherein the authors examine repurchase activities in fifteen former EU countries.

dividends.[3] Most prior U.S. studies fail to recognize the distinction between these two groups of repurchasing firms.[4] Our evidence suggests that grouping all repurchasing firms together for analysis may be potentially erroneous, because these two groups of repurchasing firms have different firm characteristics and may have different motives for repurchases.

Finally, our empirical analysis identifies excess cash as a key determinant of repurchases across countries. Our evidence suggests that, across different economic and institutional environments, firms use repurchases to distribute excess cash. Many prior U.S. studies do not consider cash holdings as a potential determinant of repurchases.[5] [See, for example, Jagannathan *et al*. (2000) and Guay and Harford (2000)]. Thus, our major contribution is to demonstrate the importance of a key determinant of repurchases that has not received much attention from prior studies.

The organization of the paper is as follows. In the next section, we briefly review prior studies. In Section 3, we present research design and describe data. In Section 4, we conduct empirical analysis and discuss the results. We conclude in Section 5.

2. Prior U.S. studies

In the U.S., share repurchases are very popular and now replaced dividends as the dominant corporate payout policy. Fama and French (2001) document that the percentage of firms paying dividends decreased significantly. Grullon and Michaely (2002) report that, in 1998, the total value of share repurchases exceeded the value of dividends.

Prior studies report that corporate managers may want to distribute cash through share repurchases rather than through dividends for several reasons. For example, share repurchases provide corporate managers with more flexibility than dividends in terms of the timing and the amounts of cash payouts. Thus, share repurchases are used to pay out temporary cash flows, while dividends are used to pay permanent cash flows [Jagannathan *et al*. (2000), Guay and Harford (2000), and Lee and Rui (2007)]. Firms with stock option programs prefer share repurchases over dividends [Jolls (1998) and Weisbenner (1998)]. Firms sometimes use share

[3] Grullon and Michaley (2002) also point out that repurchasing firms may have different firm characteristics depending on whether or not they pay dividends. On the other hand, our results on firm characteristics of these two groups of repurchasing firms are somewhat different from Grullon and Michaely (2002), as we show later. Further, unlike them, we explore potential differences in motives for share repurchases between the two groups of repurchasing firms.

[4] Prior studies tend to treat all repurchasing firms equally, regardless of whether or not they pay dividends. [See, for example, Jagannathan *et al.* (2000) and Dittmar (2000)]. For example, Jagannathan *et al*. (2000) indicate that repurchasing firms have more uncertain cash flows than firms that increase dividends. According to our results, this evidence of Jagannathan *et al*. may arise mainly from the characteristics of repurchasing firms that do not pay dividends, rather than the characteristics of repurchasing firms that pay dividends. As a further example, Dittmar (2000) lumps all repurchasing firms together—not distinguishing between those repurchasing firms that pay dividends and those that do not pay dividends—in her examination of the factors that affect the amount of repurchases.

[5] Dittmar (2000) is a notable exception. She reports that the amount of repurchases of U.S. firms is associated significantly with cash holdings.

repurchases as a means of takeover defense [Denis (1990)]. Finally, compared to dividends, share repurchases provide shareholders with tax benefits [Black (1976), Barclay and Smith (1988), and Stephens (2001)].

Some studies find that firms use share repurchases to signal that their stock is currently undervalued. For example, Dann (1981), Vermaelen (1981), Comment and Jarrell (1991), and Chan, Ikenberry and Lee (2004) report that firms experience positive excess returns around announcements of share repurchases. Dittmar (2000) reports that firms tend to conduct share repurchases when their stock is undervalued.

In a strand of share repurchase literature, researchers question whether firms use share repurchases as a substitute for dividends. Dittmar (2000) argues that firms do not use repurchases as a substitute for dividends because it appears that firms do not repurchase shares using the funds that are obtained by decreasing dividends. Jagannathan *et al*. (2000) find that share repurchases appear to serve a complementary role of paying out short-term cash flows and do not appear to be replacing dividends. Further, using aggregate time-series data of share repurchases and dividends, Lee and Rui (2007) provide evidence that share repurchases and dividends are imperfect substitutes. On the other hand, Grullon and Michaely (2002) find that firms repurchase shares using the funds that might otherwise be used to increase dividends.

3. Research design and data

Using data from seven major countries, we examine several important questions that concern a firm's decision to repurchase shares. We begin by examining the extent to which firms outside of the U.S. use share repurchases as a payout method. To do so, we compare the frequency and amount of share repurchases across the seven major countries in our sample.

We then examine the nature of share repurchases—as opposed to dividends—in each of our sample countries. To do so, we first compare the stability of a payout policy that repurchases shares to the stability of a payout policy that pays dividends. Specifically, we analyze the probability of a firm maintaining its existing payout policy or of switching from one payout policy to another. Prior U.S. studies report that share repurchases are used as a flexible means of distributing temporary income, while dividends are sticky and are associated with permanent income. If this is the case, we anticipate that a payout policy that uses repurchases is less stable than a payout policy that uses dividends.

While firms can rely solely on either repurchases or dividends for their payout policies, there are many firms that use both forms of payouts. Taking such firms into account, we divide a firm's payout policy into four categories before analyzing the stability of repurchases and dividends. These categories include: (A) policies that make no distributions; (B) policies that pay dividends, but do not repurchase shares; (C) policies that repurchase shares, but do not pay dividends; and (D) policies that both pay dividends and repurchase shares in the same year.

Our next question is as to whether firms use repurchases as a substitute for dividends. We address this question from two angles. First, by examining whether or not a firm switches frequently from a dividend-paying policy to a share-repurchasing policy (or vice versa), we can evaluate whether firms use repurchases as a substitute for dividends. That is, a high occurrence of firms that switch from a dividend-paying policy to a share-repurchasing policy (or vice versa) might indicate that firms use repurchases and dividends as substitutes for each other. Second, we examine whether firms increase, decreases, or leave dividends unchanged in the same year that they repurchase shares. If many firms decrease dividends in the same year that they repurchase shares, this might indicate that firms finance share repurchases through dividend reductions and thus offers evidence that firms use repurchases as a substitute for dividends.

Next, we examine the question of why firms choose to repurchase shares as opposed to paying dividends. To answer this question, we examine firm characteristics that are associated with share repurchases and dividends. To elaborate, we select a set of variables that represent various firm characteristics. (These variables are explained below.) We then conduct univariate and multivariate analyses on the firm characteristics across different payout policies. Our univariate analysis is based on the comparison of the median and mean values of the firm characteristic variables across different payout policies. Our multivariate analysis is conducted using multinomial logit regressions, which allow us to identify characteristics of those firms that repurchase shares, as compared to the characteristics of those firms that pay dividends.

We also conduct Tobit regressions where the dependent variable is the amount of cash distributed through repurchases, and the explanatory variables are a set of firm characteristic variables. These Tobit regressions evaluate factors that affect a firm's decision as to how much cash to distribute through repurchases, while the above-mentioned multinomial logit regressions evaluate factors that affect a firm's decision as to whether or not to repurchase shares.

In constructing our dataset, we use the Worldscope database. A key data item in our study is the amount of share repurchases—that is, the amount of cash that a firm expends to reduce common shares in circulation for either retaining them as treasury shares or canceling them. Our approach is to utilize share repurchase data that are comparable to that of Grullon and Michaely (2002), who use the Compustat database to obtain the actual amount of cash that is distributed to shareholders through share repurchases within a given fiscal year. In doing so, they subtract Compustat #56 (reduction in the value of the net number of preferred stock outstanding) from Compustat #115 (total expenditure on the purchase of common and preferred stocks).

A problem that we encounter when using Worldscope is that the database does not provide an item that appropriately corresponds to Compustat #56, while Worldscope does offer an item that corresponds to Compustat #115. The Worldscope item that corresponds to Compustast #115 is 'common/preferred, retired, converted, etc. (#04751)', a cash-flow statement item. According to the Worldscope data guide, this item is the amount of funds that are used to

reduce outstanding shares of common or preferred stock. Since we are not able to identify the amount of cash that is used to reduce preferred shares, we drop firms if they include preferred stock on the balance sheet, even if these firms might repurchase common shares during a given year.[6]

Our dataset includes firm-year observations from seven developed countries— Australia, Canada, France, Germany, Japan, the U.K., and the U.S.—over the period 2000-2005.[7] We exclude financial services firms from our sample. Our data construction process requires that a firm-year observation have records of both dividend payments and share repurchases. In other words, if a firm-year observation does not have the amount of dividend payments and share repurchases, it is removed.

We use two payout variables, REPR and DIVR, which are the amount of repurchases and dividends during a given year scaled by the previous year-end total assets, respectively. In dealing with outliers, we opt to remove observations if the relative amount of dividends (DIVR) is greater than one, and the relative amount of share repurchases (REPR) is less than zero or greater than one.

To analyze whether a given payout policy is explained by a certain set of firm characteristics, we construct a dataset of firm characteristic variables for our sample firms. This dataset includes ten variables that represent a range of firm characteristics, which are: firm size (TA), market-to-book ratio (MBR), cash holdings (CASH), operating profitability (ROA), debt-to-equity ratio (LEVER), stock returns (SRET), non-operating profit (NOPER), the ratio of retained income and total equity (RE/TE), stock return volatility (SRVOL), and operating profitability volatility (ROAVOL). Among these variables, MBR is a proxy for growth option. RE/TE is a proxy for the financial life-cycle stage of a firm.[8] NOPER is a proxy for temporary cash flow. Both SRVOL and ROAVOL are proxies for the level of cash flow uncertainty faced by a firm.

We deal with extreme values by winsorizing each of these ten variables at the bottom and top one percent of their respective distributions each year. For MBR and RE/TE, we treat observations with negative book values as missing values. Table 1 provides descriptions of our two payout variables and the ten firm-characteristic variables.

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[6] While the use of preferred shares varies somewhat in its extent across countries, we lose only a small fraction of firms by excluding firms that have preferred shares. There is no reason to believe that excluding those firms will bias our analysis.

[7] Our sample period is relatively short because in many countries outside of the U.S., share repurchases were not legal or were difficult to implement due to many regulations that existed in these countries until the early or late 1990s [See, for example, Kim, Schremper and Varaiya (2005)].

[8] DeAngelo, DeAngelo and Stulz (2006) use RE/TE as a proxy for a firm's stage in its financial life cycle. They present evidence that the probability of a firm paying dividends is related to its financial life cycle stage.

4. Empirical evidence

4.1 Relative importance of share repurchases in major countries

We begin with examination of the relative use of share repurchases and dividends across seven major countries. In doing so, we analyze the number and percentage of firms that adopt each of the four types of payout policies: (A) policies with DIVR=0 and REPR=0, (B) policies with DIVR>0 and REPR=0, (C) policies with DIVR=0 and REPR>0, and (D) policies with DIVR>0 and REPR>0, respectively.

For each country, Table 2 presents the number and percentage of firms that belong to each of the four types of payout policies over the sample period 2000-2005. Consistent with prior U.S. studies, the number and percentage of firms that repurchase shares is very high in the U.S. For example, in the year 2005, the number of firms that use share repurchases solely or in conjunction with dividends is 1,247 (=647+607), which is more than twice the number of firms that use only dividends, 502. Among the firms that distribute cash to shareholders, the proportion of firms that use share repurchases solely or in conjunction with dividends is as high as 71.4% (=36.8% + 34.6%) in the year 2005. What is also notable about this wide adoption of share repurchases by U.S. firms is that throughout the sample period, the number of firms that only repurchase shares is greater than the number of firms that only pay dividends or the number of firms that both pay dividends and repurchase shares. These observations confirm that share repurchases have replaced dividends as the dominant form of payout for U.S. firms in recent years.

In contrast, the table shows that share repurchases are not widely used by non-U.S. firms. The percentage of firms that distribute cash using repurchases, either solely or in conjunction with dividends, is small for firms outside of the U.S. In particular, unlike in the U.S., the percentage of firms that only repurchase shares is small outside of the U.S. While, in the U.S., 36.8% of firms use only repurchases in the year 2005, the percentage of such firms is only 2.7% in Australia during the same year. While the percentage of such firms is slightly higher in Canada (13.8% in the year 2005), the percentage of firms that use only repurchases is generally fewer than 10% in countries outside of the U.S. Further, it appears that with the exception of Japanese firms, non-U.S. firms generally use dividends as their primary payout method. For example, in the year 2005, the percentage of firms that distribute cash only through dividends is as high as 81.3% in Australia and 81.7% in Germany, respectively. In sum, our data show that the use of share repurchases, as a firm's sole payout method or in conjunction with dividends, is uncommon among non-U.S. firms.[9]

Next, we examine the relative amount of cash that is distributed through repurchases

[9] There is some evidence to suggest that the use of share repurchases is on the rise in some countries. For example, in France, the percentage of firms that use share repurchases in conjunction with dividends increases steadily over the sample period (from 11.3% in 2000 to 33.2% in 2005). A similar pattern is observed in Japan.

and dividends. Table 3 reports the amount of cash that is distributed through dividends and share repurchases for the seven major countries studied over the sample period. As expected, U.S. firms display a strong propensity to distribute more cash through share repurchases than through dividends. For example, for U.S. firms that use both dividends and share repurchases (Group (D)), both the mean and median repurchases-to-total assets ratios (REPR)—3.974% and 1.630%, respectively—are higher than the mean and median dividends-to-total assets ratios (DIVR)—2.383% and 1.600%, respectively.

In contrast, the table shows that firms outside of the U.S. generally distribute less cash through share repurchases than through dividends. For example, when non-U.S. firms use both dividends and repurchases, they tend to distribute more cash through dividends than through share repurchases. For Australian firms that use both share repurchases and dividends, the median DIVR, 4.060%, is much greater than the median REPR of 1.774%. For Canadian firms that use both dividends and repurchases, the median DIVR is 1.029%, which is higher than their median RERP, which is 0.715%. A similar pattern is found for firms in other countries outside of the U.S. Thus, for non-U.S. firms, dividends remain the more important payout method in terms of the amount of cash distributed.[10]

Then why are share repurchases relatively uncommon among non-U.S. firms? We discuss several factors that might contribute to the relative lack of share repurchases by non-U.S. firms. First, this relative lack of share repurchases by non-U.S. firms may be due in part to the fact that share repurchases remained illegal or were difficult to implement until recently in several countries outside of the U.S. As Kim, Schremper and Varaiya (2005) report, for example, share repurchases were illegal until 1998 in Germany and France. In Australia, share repurchases became legal in 1989 but were difficult to implement until 1995 when the legal regulation of share repurchases was simplified [Ramsay and Lamda (2000)]. In some countries, there still exist a few restrictions that make the implementation of share repurchases difficult. In France, Germany and the U.K., for example, firms must obtain shareholder approval before implementing share repurchases, whereas board approval is sufficient in the U.S. In Canada, there is a 5% ceiling on the proportion of shares that a firm can repurchase.

Second, it is necessary to pose a question of whether the U.S. tax system favors share

[10] An interesting pattern to note is the relative amount of cash distributed through share repurchases by Japanese firms. As seen in Table 2, the number and proportion of firms that use share repurchases is fairly high in Japan, which gives the impression that share repurchases are widely used in the country. However, as Table 3 shows, the amount of cash that is distributed through share repurchases is very small for Japanese firms. For example, when Japanese firms use both dividends and share repurchases, they distribute much more cash through dividends than through share repurchases. The median DIVR for firms that use both dividends and repurchases (i.e., Group (D)) is 0.687% in Japan, a lot higher than their median REPR, which is 0.075%. Further, when Japanese firms distribute cash only through share repurchases, the amount of payout is typically small. The median REPR for firms that use only repurchases in Japan is only 0.007%. Thus, in terms of the relative amount of cash distributed, dividends remain the principal payout method for firms outside of the U.S., even including Japan.

repurchases over dividends relative to the tax systems of other countries. In the U.S., the tax rate for individuals for long-term capital gains is generally lower than the tax rate on dividend income. On the other hand, capital gains are taxed at lower rates than dividend income in several other countries as well. For example, in Germany, long-term capital gains are tax-exempt. In Canada, only 50% of a capital gain is taxed at an ordinary rate. In Japan, capital gains are taxed at a rate as low as 10%.[11] Given that the use of share repurchases is relatively uncommon in these countries, the structure of tax rates may not be a decisive factor that explains the lack of share repurchases by non-U.S. firms.[12]

Third, a potentially important factor is the relative use of stock options as a compensation tool across countries. Prior studies conjecture that the recent rise in the popularity of share repurchases among U.S. firms relates to their increased use of stock options [Jolls (1998) and Weisbenner (1998)]. To our knowledge, there is no systematic cross-country comparative study of the use of stock options, but the use of stock options may be more common among U.S. firms than among firms in other countries. In Japan, for example, the use of stock options was permitted by law only in the late 1990s [Kato, Lemmon, Luo and Schallheim (2005)]. If so, the lack of share repurchases by non-U.S. firms may be due in part because their use of stock options as a compensation tool is less common.

4.2 Stability of payout policy

In this section, we analyze the stability of payout policy across countries by using transition matrices. After dividing firms into four groups according to the type of their payout policy, we examine the frequency and probability of firms that retain their existing payout policy or that switch to other payout policies. This analysis of the stability of payout policy allows us to compare the nature of dividends and share repurchases as payout methods.

Table 4 presents transition matrices for firms in seven major countries over the period 2000-2005. First, the table shows that in the U.S., when firms making no distributions (i.e., Group (A) firms) initiate cash distribution in the subsequent year, they are more likely to do so through share repurchases (1,090 firms) than through dividends (136 firms), which reflects the popularity of share repurchases among U.S. firms. In other countries, however, firms are more likely to choose dividends than share repurchases when they initiate cash distribution, with the exception of Canadian firms. For example, when firms in Australia initiate cash distribution, 79 firms choose dividends, while only 21 firms choose share repurchases over the time period studied. Also in Japan, more firms choose dividends (124 firms) than share repurchases (69

[11] The source of these tax rates is the worldwide tax summaries of PricewaterhouseCooper (www.pwc.com).

[12] It is worth pointing out that different tax systems across countries may not be a decisive factor for cross-country differences in the amount of dividends either. For example, La Porta *et al*. (2000) document that cross-country differences in the amount of dividends are not related to different tax rates across countries.

firms) when they initiate cash distribution.

Second, across countries, firms that only pay dividends (i.e., Group (B) firms) display a high propensity to retain their dividend-paying policy in the subsequent year. For example, in Australia, the probability that a firm that only pays dividends continues to do so in the subsequent year is as high as 86.7%. Across all countries studied, the probability that a firm that only pays dividends continues to do so in the subsequent year ranges from 68.1% to 88.6%. This high level of stability of the dividend-paying policy reflects the sticky nature of dividends, and is consistent with the well-publicized behavioral pattern of managers who desire to avoid dividend omissions [Linter (1956), and Brav, Graham, Harvey and Michaely (2005)].

In contrast, across countries, firms that only repurchase shares (i.e., Group (C) firms) display much weaker stability in their payout policy. In Australia, for example, only 34.0% of firms that only repurchase shares implements the same payout policy in the subsequent year. A related observation is that, across countries, relatively many firms that only repurchase shares make no cash payouts in the subsequent year. For example, in the U.S., as many as 32.6% of firms that only repurchase shares distribute no cash in the subsequent year. In contrast, the table shows that it is rare for firms that pay dividends to become non-payers in the subsequent year. These observations are consistent with conventional wisdom that share repurchases are used as a flexible means of distributing cash, while dividends are sticky.

Another interesting pattern emerges when we analyze the stability of the payout policy that uses both dividends and share repurchases (i.e., Group (D) firms). The table shows that many firms that use both dividends and repurchases continue to pay dividends but do not continue to repurchase shares in the subsequent year (46.4% in Australia, for example). On the other hand, only a small percentage of such firms switch to a policy in the subsequent year that repurchases shares but does not pay dividends (only 2.9% in Australia, for example). Thus, the data show that while it is rare for firms that use both dividends and share repurchases to drop dividends and rely only on share repurchases, it is quite common for such firms to continue to pay dividends in the subsequent year. Again, this observation suggests that share repurchases are a flexible means of distributing cash, while dividends are sticky.

There is another noticeable pattern in Table 3. It is very rare, across countries, for firms that only pay dividends (i.e., Group (B) firms) to switch to a policy that only repurchases shares (i.e., Group (C) firms) in the subsequent year. Even in the U.S., where share repurchases are widely used, only 0.2% of firms that only pay dividends switch to a policy that uses only share repurchases in the subsequent year. Similarly, it is rare, across countries, for firms that only repurchase shares to switch to a policy that uses only dividends in the subsequent year. In all countries, the probability that firms that use a dividend-only policy switch to a share repurchase-only policy in the subsequent year is less than 1%. The probability that firms that use a share repurchase-only policy switch to a dividend-only policy is also low, ranging from 1.0% to 15.1%

across all countries studied. Thus, the data show that it is uncommon for firms to drop dividends in order to adopt share repurchases as a payout method, or vice versa. This observation may be viewed as evidence that firms do not use dividends and share repurchases as substitutes for each other.

To summarize our results, we find that, across countries, a firm's decision to maintain its existing payout policy or to switch from one policy to another is consistent with conventional wisdom that share repurchases are flexible means of cash distribution, while dividends are sticky. Grullon and Michaely (2002) report similar patterns using transition matrices for U.S. firms. We also find that the probability of firms switching from a dividend-only policy to a share repurchase-only policy, or vice versa, is very low, which suggests that dividends and repurchases may not be perfect substitutes for each other.

4.3 Share repurchases and dividend increases

In this section, we examine the question of whether firms use share repurchases as a substitute for dividends. Prior U.S. studies document evidence that firms do not use share repurchases as a substitute for dividends [See, for example, Guay and Harford (2000), Dittmar (2000), and Lee and Rui (2007)]. Our earlier results, presented above, suggest that repurchases and dividends may not be substitutes for each other, in that the probability of firms switching from a dividend-only policy to a share repurchase-only policy, or vice versa, is very low across all countries studied.

The question of whether firms use share repurchases as a substitute for dividends can be restated as whether firms repurchase shares using funds that are obtained by reducing dividends.[13] We test this question by examining whether share repurchases tend to coincide with dividend decreases in the same year. The motivation for this test is the conjecture that if firms use share repurchases as a substitute for dividends, they will decrease dividends in the same year that they repurchase shares.

For this test, we construct a sample by combining two groups of dividend-paying firms from the seven major countries over the period 2000-2005: (i) dividend-paying firms that do not repurchase shares in the same year and (ii) dividend-paying firms that repurchase shares in the same year. However, we do not include firms that only repurchase shares and firms that make no payouts in this analysis, because, as our earlier results suggest, it is rare for these firms to have paid dividends in the previous year or pay dividends in the subsequent year. The question of whether share repurchases are funded through dividend reduction is irrelevant for these firms.

Once we construct this sample, we divide the sample firms based on two criteria: first,

[13] Another version of this substitution hypothesis in the repurchase literature is that of Grullon and Michaely (2002). Their substitution hypothesis examines whether repurchases are financed by funds that would otherwise be used to increase dividends.

by whether or not they repurchase shares, and second, by whether they increase, decrease or leave dividends unchanged, as compared to dividends in the previous year. We then tabulate the frequencies and proportions of firms that increase, decrease or leave dividends unchanged, conditional on whether or not they repurchase shares in the same year.

For each of the seven countries, Table 5 reports the frequencies and proportions of firms that increase, decrease, and leave dividends unchanged for both non-repurchasing and repurchasing firms. The numbers in the second columns indicate that, across countries, when firms repurchase shares, the majority of them increase dividends in the same year. For example, in Australia, among 191 firms that repurchase shares, as many as 140 of these firms (73%) also increase dividends. In the U.S., 75% of repurchasing firms increase dividends in the same year. In all sample countries, more than half of the firms that repurchase shares also increase dividends in the same year.[14]

In sum, our data presents strong evidence that the majority of share repurchases are accompanied by dividend increases (rather than dividend decreases) in the same year.[15] This evidence indicates that, across countries, most firms do not repurchase shares using funds that are obtained by decreasing dividends. This evidence corroborates prior U.S. studies such as those of Guay and Harford (2000) and Dittmar (2000), which document that firms do not use repurchases as a substitute for dividends.

A related question is as to whether firms repurchase shares using funds that would otherwise be used to increase dividends. Grullon and Michaely (2002) test this question. Their U.S. study documents that share repurchases are negatively correlated with the dividend forecast error, which indicates that funds used to repurchase shares might be the same funds that might be used to increase dividends. Though our international data do not offer sufficient time-series observations to replicate the Grullon and Michaely, we can evaluate this question on the basis of synchronicity of share repurchases and dividend increases.

To evaluate this question, it helps to pay attention to an important pattern that emerges from Table 5. According to the table, repurchasing firms are less likely to increase dividends than non-repurchasing firms. For example, in Australia, the percentage of firms that increase dividends is 85% among non-repurchasing firms, while the corresponding percentage is 73% among repurchasing firms. In all countries, including the U.S., the probability that a repurchasing

[14] Japan presents an interesting case in that the percentage of repurchasing firms that increase dividends in the same year is relatively low (54%). Our data suggest that this may be due to the fact that dividend decreases are common in Japan. Table 5 shows that even for the firms that do not repurchase shares, the percentage of firms that decrease dividends is relatively high (35%) in Japan.

[15] We also examine whether repurchasing firms increase dividends substantially in the same year. Following Guay and Harford (2000), we define a substantial dividend increase as an increase that is not preceded by a dividend increase in the prior year, or one that is greater than the dividend increase in the prior year. We find that in almost all countries, more than half of the firms that repurchase shares increase dividends substantially in the same year. The only exception is found in Japanese firms, for which the percentage of repurchasing firms that increase dividends substantially in the same year is 47%.

firm increases dividends in the same year is lower than the probability that a non-repurchasing firm does the same. This pattern suggests that repurchasing firms may finance share repurchases using the same funds that might be used to increase dividends.

The flip side of the above pattern is that repurchasing firms are more likely to decrease dividends than are non-repurchasing firms. For example, in the U.K., the percentage of repurchasing firms that decrease dividends (35%) in the same year is more than twice the percentage of non-repurchasing firms that decrease dividends (16%). Across countries, the probability that repurchasing firms decrease dividends in the same year is greater than the probability that non-repurchasing firms decrease dividends in the same year.[16] Overall, these patterns suggest that, across countries, firms appear to repurchase shares using funds that would otherwise be paid as dividends—though the majority of firms do not fund share repurchases by decreasing dividends.

To summarize, we find that the majority of repurchasing firms in each country increase dividends when they repurchase shares, which means that the majority of firms increase their total distributions when they repurchase shares. Thus, firms in general do not finance share repurchases by reducing dividends. In this sense, across countries, firms generally do not use share repurchase as a substitute for dividends. On the other hand, we find some evidence that firms may repurchase shares using funds that would otherwise be used to increase dividends. This evidence indicates that a trade-off between share repurchases and dividend increases may exist.

4.4 Firm characteristics of share repurchasing firms

In order to identify factors that affect a firm's decision to repurchase shares, we examine firm characteristics of repurchasing firms based on the nine variables (described above) that represent a variety of firm characteristics.

In conducting the analysis, we account for the possibility that repurchasing firms may have different firm characteristics, depending on whether they also pay dividends. Our earlier results from the transition matrices show that repurchasing firms that also pay dividends rarely switch to a policy that omits dividends and only repurchases shares. On the other hand, repurchasing firms that do not pay dividends rarely switch to a policy that pays dividends. These observations suggest that different sets of forces may govern a firm's decision to repurchase shares, depending on whether the firm also pays dividends.[17]

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[16] We find, however, that, across countries, slightly more than half of the repurchasing firms that decrease dividends in the same year also raise the amount of total distributions (which is the sum of dividends and repurchases) that year, relative to the previous year. In other words, there are many repurchasing firms that increase the amount of total distributions even if they reduce dividends. This indicates that there are relatively few occurrences in which repurchases are financed purely through dividend reductions.

[17] Among prior U.S. studies, Grullon and Michaely (2002) document that repurchasing firms that pay dividends may have different firm characteristics from repurchasing firms that do not pay dividends.

For each of the seven major countries studied, Table 6 reports the mean and median values of the nine firm-characteristic variables for the four groups of firms classified by payout policy. Indeed, the table shows that, across countries, the two groups of repurchasing firms, (C) and (D), have many different firm characteristics. Compared to repurchasing firms that also pay dividends, repurchasing firms that do not pay dividends are smaller, less profitable, at an earlier stage in the financial life cycle, and experience high profit and stock return volatilities.

To elaborate, first, in all countries, repurchasing firms that do not pay dividends are small, as compared to repurchasing firms that pay dividends. For example, in France, the mean and median values for the firm size of repurchasing firms that do not pay dividends are US$90.31 million and US$59.58 million, respectively, both of which are less than the corresponding mean and median values for repurchasing firms that pay dividends (US$1,444.03 million and US$1,598.22 million, respectively). Second, in all countries, repurchasing firms that do not pay dividends have low operating profitability, as compared to repurchasing firms that pay dividends. For example, in Germany, the mean and median values for operational profitability (ROA) for repurchasing firms that use only share repurchases (−0.05 and 0.01, respectively) are lower than the corresponding values for repurchasing firms that also pay dividends (0.12 and 0.09, respectively).

Third, in all countries, repurchasing firms that do not pay dividends have relatively low earned-to-contributed equity ratios. For example, in the U.S., the mean and median RE/TE ratio values for repurchasing firms that do not pay dividends are only −0.58 and 0.22, respectively, while the corresponding values for repurchasing firms that pay dividends are greater (0.68 and 0.80, respectively). This observation indicates that firms that only repurchase shares are typically at an early stage in their financial life cycle. Fourth and finally, across countries, repurchasing firms that do not pay dividends experience high volatilities in profitability (ROAVOL), as compared to repurchasing firms that pay dividends. In the U.K., for example, the mean and median values for operating profitability volatility (ROAVOL) for repurchasing firms that do not pay dividends (16.63% and 3.94%, respectively) are greater than the corresponding values for repurchasing firms that pay dividends (3.79% and 1.66%, respectively).

The above results collectively suggest that there are two distinct groups of repurchasing firms. They have different firm characteristics and thus may have different motives for repurchases. In particular, given that the profitability of repurchasing firms that do not pay dividends is low and volatile, these firms may not be able to choose dividends to distribute cash due to the sticky nature of dividends.[18]

[18] The summary statistics of the table also suggest that, across countries, repurchasing firms that pay dividends are more similar to firms that only pay dividends than they are to repurchasing firms that do not pay dividends. On the other hand, across countries, repurchasing firms that do not pay dividends have similar characteristics to those firms that do not make any payouts. These impressions are largely consistent with the results of Grullon and Michaely's (2002) U.S. study.

Next, we conduct multinomial logit regressions to examine the firm characteristics of repurchasing firms that set them apart from those firms that only pay dividends. This regression analysis allows us to evaluate the importance of a given firm characteristic while controlling for the influence of other firm characteristics. Our objective is to identify factors that affect a firm's decision to repurchase shares, as opposed to the decision to pay dividends. Given that there are two distinct groups of repurchasing firms, we conduct two sets of comparisons. In the first set of comparisons, we compare characteristics of repurchasing firms that do not pay dividends to those of firms that only pay dividends. In the second set of comparisons, we compare characteristics of repurchasing firms that also pays dividends to those of firms that only pay dividends.

Table 7 reports the results of multinomial logit regressions for which repurchasing firms that do not pay dividends (i.e., firms in Group (C)) are the reference firms. In all or nearly all countries, five variables enter significantly with consistent signs when firms that only pay dividends are the comparison firms (i.e., firms in Group (B)). These variables include firm size (log(TA), cash holdings (CASH), profitability (ROA), the earned-to-contributed equity ratio (RE/TE) and operating profit volatility (ROAVOL). Among these variables, log(TA), CASH, and ROAVOL enter significantly with consistent signs—(+), (−) and (−), respectively—in all seven countries. ROA enters significantly with a positive sign in all countries except for the U.S. RE/TE enters positively in all countries and also significant in all countries except for Canada.

Thus, our regression results suggest that, across countries, repurchasing firms that do not pay dividends are smaller, have larger cash holdings, are less profitable, are at an earlier stage of financial life cycle, and experience high profit volatilities, as compared to firms that only pay dividends. These differences suggest that firms that only repurchase shares may rely solely on repurchases to distribute excess cash because they cannot afford to use dividends—which are sticky—due to their low and volatile profitability.

Table 8 reports multinomial logit regression results for which repurchasing firms that pay dividends (i.e., firms in Group (D)) are the reference firms. The table shows that repurchasing firms that pay dividends are different from firms that only pay dividends (i.e., Group (B) firms) in at least two characteristics: firm size (TA) and cash holdings (CASH). The coefficients for these two variables display consistent and significant signs in all, or almost all, seven countries. First, the coefficient for firm size (log(TA)) is negative and significant in all countries. Second, the coefficient for cash holdings (CASH) is negative for all seven countries and also significant with two exceptions, France and the U.S. These results suggest that, across countries, repurchasing firms that pay dividends tend to be large and have large cash holdings, as compared to firms that only pay dividends.

It is worth noting that the above-mentioned differences are contrary to Grullon and Michaely (2002), who argue that "conditioning on a firm paying dividends, there is *no* difference between firms that do or do not repurchase shares." Across countries, we find that among

dividend-paying firms, repurchasing firms are large in size and have large cash holdings, compared to non-repurchasing firms.

To summarize, our results strongly suggest that there are two distinct groups of repurchasing firms: those that pay dividends and those that do not pay dividends. Further, we find that repurchasing firms that do not pay dividends have many characteristics that separate them from firms that only pay dividends. We conjecture that the characteristics of repurchasing firms that do not pay dividends, especially, low profitability and high profit volatilities, make it difficult for these firms to choose dividends—which are sticky —as their payout methods. We also find that while repurchasing firms that also pay dividends are relatively similar to firms that only pay dividends, the former have at least two characteristics that distinguish them from the latter. Finally, it is also notable that although the two groups of repurchasing firms have many different characteristics, both of these groups share one similar characteristic—large cash holdings—that distinguishes them from firms that only pay dividends. Thus, this evidence suggests that, across countries, an important motive for repurchasing shares may be to distribute excess cash.

4.5 Factors associated with the amount of share repurchases

Next, we attempt to identify factors that affect a firm's decision as to the amount of share repurchases. For each country in our sample, we estimate a Tobit regression model where the dependent variable is the amount of share repurchases (REPR). The explanatory variables include nine firm characteristics plus the lagged dividend (DIVR_L). The lagged dividend is used to control for whether the firm has paid dividends in the previous year. These explanatory variables overlap many of the variables that are used by Dittmar (2000).[19]

In estimating the Tobit regression model, we pay special attention to the distinction between two groups of repurchasing firms—those that pay dividends and those that do not. Our earlier results suggest that repurchasing firms have different firm characteristics, depending on whether or not they also pay dividends. These results also suggest that different sets of forces may govern a firm's decision as to the amount of repurchases, depending on whether the firm pays dividends. With this distinction in mind, we estimate our Tobit regression model separately for two groups of firms: (i) firms that pay dividends and (ii) firms that do not pay dividend.

The hypotheses we test in this Tobit regression analysis are as follows. First, we test the excess cash hypothesis that firms use repurchases to distribute excess cash. According to this hypothesis, firms with large cash holdings distribute more cash through repurchases. Thus, this hypothesis predicts that cash holdings (CASH) enter with a positive sign in the regression. Second, we test the undervaluation hypothesis that firms repurchase shares when their shares are

[19] Compared to Dittmar (2000), however, data limitations in this international study do not allow us to use variables that capture the use of stock options and the threat of takeover.

undervalued. We use the market-to-book ratio (MBR) and the cumulative stock return (SRET) as proxies for undervaluation. This hypothesis predicts that both MBR and SRET enter with negative signs. Third, we test the temporary cash flow hypothesis that firms use repurchases to distribute temporary cash flows. As Jagannathan *et al*. (2000) do, we use non-operating income (NOPER) as a proxy for temporary cash flow. This hypothesis predicts that NOPER enters with a positive sign. Fourth, we test the optimal leverage hypothesis that firms use repurchases to achieve target leverage. Assuming that firms with low leverage distribute more cash through repurchases to achieve greater leverage, this hypothesis predicts that the debt-to-equity ratio (LEVER) enters with a negative sign.

Table 9 reports the results of Tobit regressions for each of the seven major countries over the period 2000-2005.[20] Columns (1) contains results for all sample firms in each country; Columns (2) contains results for firms that pay dividends; and Columns (3) contains results for firms that do not pay dividends.

Among the hypotheses we consider, the results lend strong support to the excess cash hypothesis, which conjectures that firms with large cash holdings distribute more through repurchases. For all firms (in Columns (1)) in each country, cash holdings enter consistently with a positive sign. Without exception, its coefficient is also significant in all countries. This impact of cash holdings on the amount of repurchases remains strong when we consider only dividend paying firms (in Columns (2)). The coefficient for cash holdings is positive in all countries and is also statistically significant in all but one country, France. Likewise, the impact of cash holdings on the amount of repurchases is strong, when we consider only non-dividend paying firms (in Columns (3)). The coefficient for cash holdings has consistently positive signs in all seven countries and is significant in all but one country, Australia.

Overall, across countries, cash holdings have a positive impact on the amount of repurchases. For both dividend-paying firms and non-dividend-paying firms, cash holdings appear to be a consistent predictor for the amount of repurchases. This evidence strongly indicates that firms may repurchase shares in order to distribute excess cash.[21]

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[20] Our Tobit regressions are panel regressions on firm-year observations. In the regression results presented in Table 9, we do not control for year or firm effects. However, when we control for year effects using fixed year dummies, the results do not change qualitatively. Likewise, when we control for both year and firm effects using fixed year and firm dummies, the results remain unchanged for regressions on all sample firm-years or only dividend-paying firm-years for each country. On the other hand, for some countries, adding fixed firm effects poses a problem for estimating the regression for non-dividend-paying firm years. This is because there is an insufficient number of repurchasing firms among non-dividend paying firms in some countries, for example, in Australia and France. These results, which account for year and/or firm fixed effects, are available upon request.

[21] Note that the cash holdings variable (CASH) in our analysis is the amount of cash at the prior year-end (scaled by total assets at the prior year-end). We also examine whether the amount of repurchases is associated with post-repurchase cash holdings by using cash holdings at the current year-end. These Tobit regression results shows—both for dividend-paying firms and non-dividend-paying firms—that the amount of repurchases is not related to post-repurchase cash holdings. Multinomial logit regression results also

On the other hand, the other hypotheses we consider do not fare as well across countries. First, in Columns (1), the sign of the coefficient of MBR is not consistent across countries. It is positive for the U.S., but negative for most other countries. The sign of the coefficient of SRET is not consistent across countries either. Thus, the data do not lend much support to the hypothesis that undervalued firms repurchase shares to distribute cash. Second, in Columns (1), the sign of the coefficient of NOPER is negative in many countries except for in Australia. This does not support the hypothesis that firms with temporary cash flows distribute more through repurchase. Third, in Columns (1), the sign of the coefficient of LEVER is negative except for in one country, Canada. It is also significant in five countries. Thus, our results offer some support for the hypothesis that firms with low leverage tend to make large repurchases, but the evidence is not as strong as that for the impact of cash holdings on repurchases.

In summary, across countries, cash holdings emerge as a key variable associated with the amount of share repurchases. Note that our earlier results from multinomial logit regressions show that, across countries, large cash holdings are a key firm characteristic that sets repurchasing firms apart from dividend-paying firms. Thus, both multinomial logit and Tobit regressions present strong evidence that distribution of excess cash may be an important motive for firms to repurchase shares across different economic and institutional environments.

4.6 Cash holdings in the years preceding share repurchases

Thus far, our cross-sectional analysis shows that, across countries, cash holdings are associated with the likelihood and amount of share repurchases. These results suggest that cash holdings may be a key determinant of share repurchases across different institutional and economic environments.

In this section, we delve further into the role of cash holdings in a firm's decision to repurchase shares by examining whether repurchases are preceded by an increase in cash holdings. Specifically, we examine whether repurchase-initiating firms experience an increase in cash holdings over a five-year period prior to their initiation of repurchases. This analysis helps to assess the presence of a causal relation between cash holdings and repurchases.

To examine this question, we divide repurchase-initiating firms into two groups, depending on whether or not they pay dividends. This division is necessary given that our earlier results suggest that repurchasing firms have different firm characteristics depending on whether they pay dividends.

First, we examine the cash holdings of the repurchase-initiating firms that do not pay dividends. These repurchasing firms are those that repurchase shares in year 0 but do not

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suggest that post-repurchase cash holdings are not a characteristic that distinguish repurchasing firms from dividend-paying firms. These results are available upon request.

repurchase shares in any year from year −4 through year −1, and that do not pay dividends in any year from year −4 through year 0. We identify 1,267 such firms from the seven countries under study over the period 2000-2005. We compare the innovation of these firms' cash holdings against that of firms that make no payouts in any year from year −4 through 0.

Figure 1 graphs the innovation of the relative cash holdings of the repurchase-initiating firms that do not pay dividends as well as the innovation of the relative cash holdings of the comparison firms that make no payouts. In order to standardize cash holdings that may differ across firms, we set the level of cash holdings (i.e., cash scaled by total assets) at the beginning of the five year period (i.e., year −4) to 100. Thus, relative cash holdings in each year are the level of cash holdings in that year relative to the beginning-of-the-five-year level.

The graph shows that the repurchase-initiating firms that do not pay dividends experience an increase in cash holdings before their repurchases. The median value of cash holdings rises by approximately 17 percent (from 100 to 116.95) from year −4 through year 0. The graph also shows that the cash holdings of the comparison firms—that is, the firms that make no payouts—also experience an increase in cash holdings over the five-year period, but the magnitude of the increase in their cash holdings is relatively small—approximately 5 percent (from 100 to 105.24).

Next, we examine the cash holdings of the repurchase-initiating firms that pay dividends. These repurchasing firms are those that repurchase shares in year 0 but do not repurchase shares in any year from year −4 through year −1, and that pay dividends in every year from year −4 through year 0. For comparison, we also analyze the cash holdings of firms that do not repurchase shares in any year from year −4 through year 0, but that pay dividends in every year from year −4 through 0.

Figure 2 graphs the innovation of cash holdings of the repurchase-initiating firms that pay dividends in comparison with that of the firms that only pay dividends. The graph shows that the repurchase-initiating firms that pay dividends experience an increase in cash holdings in the years preceding their repurchases. Over the five year period, their median cash holdings increase by approximately 4 percent (from 100 to 103.63). In contrast, the median cash holdings of the comparison firms drop by approximately 7 percent (from 100 to 93.24) from year -4 through 0.

Hence, our analysis of the variation of cash holdings over time indicates that both groups of repurchase-initiating firms experience an increase in cash holdings in the years preceding their repurchases. This evidence suggests that firms may repurchase shares to distribute accumulated cash. In conjunction with the evidence from our cross-sectional analysis, this suggests that cash holdings may be a key factor in motivating firms to repurchase shares.

However, it is also possible to argue that an increase in cash holdings may motivate firms to distribute cash through dividend increases as well. Indeed, firms that experience an increase in cash holdings may distribute cash through either repurchases or dividend increases or

both.

Our next analysis chooses firms that increase dividends either substantially or routinely, and examines the variation of their cash holdings prior to their decision to increase dividends. A substantial dividend increase is defined as one that is greater than the increase of the previous year.[22] A routine dividend increase is defined as one that is not substantial.

Figure 3 graphs the innovation of cash holdings of those firms that increase dividends either substantially or routinely. The graph shows that the dividend-increasing firms experience only a slight change or a drop in their median cash holdings in the years prior to dividend increases. For those firms that make substantial dividend increases, the median value of cash holdings at the end of the five-year period is about the same as their beginning-of-the-five-year-period levels (99.26%). For those firms that make routine dividend increases, the median value of cash holdings drops by approximately 5 percent (from 100 to 94.70). Thus, the results do not provide evidence to suggest that dividend increases are associated with an increase in cash holdings.

In summary, firms that repurchase shares experience an increase in cash holdings in the preceding years, while firms that increase dividends do not experience a similar increase in cash holdings. This adds to our evidence that cash holdings are a key determinant of share repurchases across countries.[23]

5. Concluding remarks

In this investigation, we document a number of interesting patterns that emerge regarding the use of share repurchases in seven major countries. Our study is among the first to provide comprehensive evidence on the use of repurchases by firms outside of the U.S. Evidence suggests that a common set of patterns governs a firm's choice of payout methods across countries. For example, across countries, firms use repurchases as a flexible means of distributing cash, while dividends are sticky. Also, firms generally do not repurchase shares as a substitute for paying dividends. Our evidence also suggests that repurchasing firms have several unique characteristics, depending on whether or not they also pay dividends.

Our most important finding is that cash holdings are strongly associated with share repurchases across countries. Our multinomial logit regressions suggest that, across countries, large cash holdings are a key firm characteristic that sets repurchasing firms apart from those firms that only pay dividends. Our Tobin regressions suggest that, across countries, cash holdings

[22] Guay and Harford (2000) employ the same definition for substantial dividend increase.

[23] We further examine the source of the increase in cash holdings for repurchasing firms after breaking down the increase in cash holdings into three sources: cash flows from operating activities, cash flows from investing activities, and cash flows from financing activities. However, across countries, we cannot find evidence that any of these cash flows are particularly more responsible for the increase of cash holdings for those firms that initiate repurchases.

have a positive and significant impact on the amount of repurchases. Further, when we examine the innovation of cash holdings over time, we find that firms that initiate repurchases experience an increase in cash holdings prior to repurchases, while firms that increase dividends do not. While many prior U.S. studies do not consider cash holdings to be a potential determinant of repurchases, our evidence strongly suggests that, across different economic and institutional environments, firms use repurchases to distribute excess cash.

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Table 1: Description of key variables

Payout variables
Share repurchase ratio (REPR) Share repurchases during the year / last year's year-end total assets
Dividend ratio (DIVR) Cash dividends during the year / last year's year-end total assets
Total payout ratio (TOTALR) Cash dividends plus share repurchases during the year / last year's year-end total assets
Explanatory variables
Cash holdings (CASH) Last year's year-end cash and short-term investments/last year's year-end total assets
Operating profitability (ROA) Earning's before interest and taxes/last year's year-end total assets
Market-to-book ratio (MBR) Last year's market value of equity / Last year's year-end book value of equity
Firm Size (SIZE) Last year's year-end total assets
Leverage (LEVER) (Last year's year-end debt /last year's year-end book value of equity) * 100
Stock returns (SRET) Annual stock return during the last year
Retained-earnings-to-total equity ratio (RE/TE) Last year's year-end retained earnings/last year's year-end total shareholder equity * 100
Operating (ROAVOL) The standard deviation of operating rate of return (i.e., operating income/total assets) over the most recent four years including the current fiscal year
Non-operating income (NOPER) Last year's other income /last year's total assets

Table 2: Frequency of payout policies by county and year

This table reports the number of firms that adopt each payout policy for seven major countries over the period 2000-2005. In each year, firms in each country are divided into four categories according to their payout policy: (A) a policy that distributes nothing; (B) a policy that distributes cash only through dividends; (C) a policy that distributes cash only through share repurchases; and (D) a policy that uses both dividends and share repurchases. The numbers under column 'freq' are the numbers of firms in a given category for each respective year. The numbers under column 'percent', the numbers in parentheses, are the percentages of firms in a given category among those firms that distribute cash either through dividends or through share repurchases or through both.

Country	Type	2000		2001		2002		2003		2004		2005	
		freq	percent	freq	percent	freq	percent	freq	percent	freq	percent	freq	percent
Australia	A	57		160		265		265		234		233	
	B	115	(82.7%)	145	(78.4%)	201	(83.8%)	219	(81.1%)	248	(83.2%)	270	(81.3%)
	C	3	(2.2%)	3	(1.6%)	15	(6.3%)	19	(7.0%)	16	(5.4%)	9	(2.7%)
	D	21	(15.1%)	37	(20.0%)	24	(10.0%)	32	(11.9%)	34	(11.4%)	53	(16.0%)
Canada	A	131		142		155		164		176		226	
	B	40	(33.6%)	62	(48.8%)	72	(52.2%)	90	(56.6%)	118	(61.8%)	154	(66.4%)
	C	42	(35.3%)	42	(33.1%)	41	(29.7%)	34	(21.4%)	31	(16.2%)	32	(13.8%)
	D	37	(31.1%)	23	(18.1%)	25	(18.1%)	35	(22.0%)	42	(22.0%)	46	(19.8%)
France	A	61		101		107		108		115		53	
	B	146	(86.9%)	152	(84.0%)	151	(83.4%)	169	(77.2%)	159	(71.6%)	141	(57.8%)
	C	3	(1.8%)	8	(4.4%)	3	(1.7%)	18	(8.2%)	8	(3.6%)	22	(9.0%)
	D	19	(11.3%)	21	(11.6%)	27	(14.9%)	32	(14.6%)	55	(24.8%)	81	(33.2%)
Germany	A	88		122		159		165		138		134	
	B	146	(76.8%)	154	(75.1%)	140	(75.3%)	148	(77.5%)	153	(76.9%)	161	(81.7%)
	C	14	(7.4%)	23	(11.2%)	20	(10.8%)	19	(9.9%)	21	(10.6%)	11	(5.6%)
	D	30	(15.8%)	28	(13.7%)	26	(14.0%)	24	(12.6%)	25	(12.6%)	25	(12.7%)
Japan	A	130		149		189		136		110		82	
	B	548	(54.1%)	603	(51.8%)	541	(40.1%)	429	(29.9%)	468	(31.6%)	420	(27.3%)
	C	42	(4.1%)	48	(4.1%)	108	(8.0%)	103	(7.2%)	74	(5.0%)	61	(4.0%)
	D	423	(41.8%)	512	(44.0%)	700	(51.9%)	902	(62.9%)	938	(63.4%)	1057	(68.7%)
UK	A	192		310		385		379		423		479	
	B	424	(73.1%)	444	(74.4%)	472	(74.3%)	507	(74.8%)	524	(72.8%)	538	(68.1%)
	C	24	(4.1%)	26	(4.4%)	28	(4.4%)	42	(6.2%)	36	(5.0%)	55	(7.0%)
	D	132	(22.8%)	127	(21.3%)	135	(21.3%)	129	(19.0%)	160	(22.2%)	197	(24.9%)
US	A	1740		1816		1945		2036		2033		2058	
	B	241	(16.0%)	307	(18.9%)	390	(24.0%)	454	(27.7%)	489	(30.0%)	502	(28.6%)
	C	729	(48.3%)	850	(52.4%)	818	(50.4%)	708	(43.1%)	600	(36.8%)	647	(36.8%)
	D	539	(35.7%)	464	(28.6%)	416	(25.6%)	479	(29.2%)	543	(33.3%)	607	(34.6%)

Table 3: Amount of cash distributed through dividends and share repurchases

For seven developed countries, this table reports the amount of cash distributed through dividends and share repurchases by three groups of firms: (B) firms that distribute cash only through dividends; (C) firms that distribute cash only through share repurchases; and (D) firms that use both dividends and share repurchases. The sample period covers a six-year period, 2000-2005. DIVDR, REPR, and TOTALR are the amount of cash dividends, the amount of share repurchases, and the sum of cash dividends and share repurchases, respectively. All three variables are scaled by total assets.

Country	Type	n	DIVDR		REPR		TOTALR	
			mean	median	mean	median	mean	median
Australia	B	1198	7.088%	[4.746%]	.	.	7.088%	[4.746%]
	C	65	.	.	9.984%	[2.349%]	9.984%	[2.349%]
	D	201	6.399%	[4.060%]	5.330%	[1.774%]	11.728%	[6.419%]
Canada	B	536	7.970%	[5.308%]	.	.	7.970%	[5.308%]
	C	222	.	.	2.976%	[0.906%]	2.976%	[0.906%]
	D	208	2.776%	[1.029%]	2.510%	[0.715%]	5.286%	[2.383%]
France	B	918	2.563%	[1.388%]	.	.	2.563%	[1.388%]
	C	62	.	.	3.139%	[0.312%]	3.139%	[0.312%]
	D	235	2.357%	[1.505%]	1.910%	[0.602%]	4.267%	[2.533%]
Germany	B	902	2.814%	[1.519%]	.	.	2.814%	[1.519%]
	C	108	.	.	2.709%	[0.826%]	2.709%	[0.826%]
	D	158	2.728%	[1.819%]	2.048%	[1.025%]	4.777%	[3.364%]
Japan	B	3009	0.840%	[0.592%]	.	.	0.840%	[0.592%]
	C	436	.	.	0.293%	[0.007%]	0.293%	[0.007%]
	D	4532	0.891%	[0.687%]	0.643%	[0.075%]	1.534%	[0.974%]
UK	B	2909	3.212%	[2.396%]	.	.	3.212%	[2.396%]
	C	211	.	.	6.309%	[1.452%]	6.309%	[1.452%]
	D	880	3.085%	[2.329%]	4.021%	[1.492%]	7.106%	[4.455%]
US	B	2383	3.241%	[1.542%]	.	.	3.241%	[1.542%]
	C	4352	.	.	4.792%	[1.449%]	4.792%	[1.449%]
	D	3048	2.383%	[1.600%]	3.974%	[1.630%]	6.357%	[3.865%]

Table 4: Transition probabilities

This table reports the frequency and conditional probabilities of firms switching from one payout policy to another for seven major countries over the period 2000-2005. In each year, firms in each country are divided into four categories according to their payout policy: (A) a policy that distributes nothing; (B) a policy that distributes cash only through dividends; (C) a policy that distributes cash only through share repurchases; and (D) a policy that uses both dividends and share repurchases. Column T=0 is the payout policy during the current year and column T=1 is the payout policy the following year. The numbers in parenthesis are conditional probabilities.

T=0	T=1	*Australia*	*Canada*	*France*	*Germany*	*Japan*	*UK*	*US*
	A	788	633	336	519	461	1372	7323
		(87.8%)	(88.0%)	(84.2%)	(83.2%)	(68.0%)	(89.3%)	(85.1%)
	B	79	26	34	63	124	96	136
A		(8.8%)	(3.6%)	(8.5%)	(10.1%)	(18.3%)	(6.2%)	(1.6%)
	C	21	55	27	31	69	59	1090
		(2.3%)	(7.6%)	(6.8%)	(5.0%)	(10.2%)	(3.8%)	(12.7%)
	D	10	5	2	11	24	10	57
		(1.1%)	(0.7%)	(0.5%)	(1.8%)	(3.5%)	(0.7%)	(0.7%)
	nob	898	719	399	624	678	1537	8606
	A	48	9	37	76	86	100	71
		(5.3%)	(2.4%)	(5.2%)	(10.9%)	(3.4%)	(4.3%)	(4.0%)
	B	781	326	593	590	1724	1976	1343
		(86.7%)	(88.6%)	(83.2%)	(84.3%)	(68.1%)	(85.1%)	(76.2%)
B	C	3	1	1	2	18	6	4
		(0.3%)	(0.3%)	(0.1%)	(0.3%)	(0.7%)	(0.3%)	(0.2%)
	D	69	32	82	32	703	240	345
		(7.7%)	(8.7%)	(11.5%)	(4.6%)	(27.8%)	(10.3%)	(19.6%)
	nob	901	368	713	700	2531	2322	1763
	A	21	69	15	33	19	64	1148
		(39.6%)	(37.7%)	(44.1%)	(39.8%)	(5.2%)	(42.7%)	(32.6%)
	B	8	6	4	6	7	10	34
C		(15.1%)	(3.3%)	(11.8%)	(7.2%)	(1.9%)	(6.7%)	(1.0%)
	C	18	98	12	38	235	70	2194
		(34.0%)	(53.6%)	(35.3%)	(45.8%)	(64.7%)	(46.7%)	(62.4%)
	D	6	10	3	6	102	6	141
		(11.3%)	(5.5%)	(8.8%)	(7.2%)	(28.1%)	(4.0%)	(4.0%)
	nob	53	183	34	83	363	150	3517
	A	5		2	6	10	13	23
		(3.6%)	(0.0%)	(1.7%)	(5.2%)	(0.3%)	(1.9%)	(1.0%)
	B	65	51	32	39	280	235	477
D		(46.4%)	(32.9%)	(26.7%)	(33.9%)	(8.2%)	(35.2%)	(20.3%)
	C	4	4	3	3	52	8	23
		(2.9%)	(2.6%)	(2.5%)	(2.6%)	(1.5%)	(1.2%)	(1.0%)
	D	66	100	83	67	3079	412	1821
		(47.1%)	(64.5%)	(69.2%)	(58.3%)	(90.0%)	(61.7%)	(77.7%)
	nob	140	155	120	115	3421	668	2344

Table 5: Share repurchases and dividend increases

This table reports the frequency of dividend increases, decreases or no change by the firms that repurchase shares and the firms that do not repurchase shares. Our sample is comprised of firm-years from seven major countries over the period 2000-2005. The sample includes firm-years that distribute cash only through dividends (group B) and firm-years that use both dividends and share repurchase (Group (D)).

		No repurchase	Prop.	Repurchase	Prop.
Australia	Dividend increase	982	(0.85)	140	(0.73)
	No dividend increase	0	(0.00)	0	(0.00)
	Dividend decrease	168	(0.15)	51	(0.27)
	Total	1150		191	
		No repurchase	Prop.	Repurchase	Prop.
Canada	Dividend increase	417	(0.84)	162	(0.80)
	No dividend increase	0	(0.00)	0	(0.00)
	Dividend decrease	77	(0.16)	41	(0.20)
	Total	494		203	
		No repurchase	Prop.	Repurchase	Prop.
France	Dividend increase	716	(0.79)	178	(0.77)
	No dividend increase	7	(0.01)	0	(0.00)
	Dividend decrease	186	(0.20)	54	(0.23)
	Total	909		232	
		No repurchase	Prop.	Repurchase	Prop.
Germany	Dividend increase	635	(0.71)	110	(0.70)
	No dividend increase	9	(0.01)	0	(0.00)
	Dividend decrease	248	(0.28)	48	(0.30)
	Total	892		158	
		No repurchase	Prop.	Repurchase	Prop.
Japan	Dividend increase	1922	(0.65)	2426	(0.54)
	No dividend increase	0	(0.00)	0	(0.00)
	Dividend decrease	1022	(0.35)	2092	(0.46)
	Total	2944		4518	
		No repurchase	Prop.	Repurchase	Prop.
U.K.	Dividend increase	2368	(0.84)	565	(0.65)
	No dividend increase	0	(0.00)	0	(0.00)
	Dividend decrease	458	(0.16)	298	(0.35)
	Total	2826		863	
		No repurchase	Prop.	Repurchase	Prop.
U.S.	Dividend increase	1907	(0.82)	2267	(0.75)
	No dividend increase	1	(0.00)	0	(0.00)
	Dividend decrease	423	(0.18)	751	(0.25)
	Total	2331		3018	

Table 6: Firm characteristics by payout policy

This table reports the mean and median values for key firm variables for our sample of firm-year observations for seven major countries over the period 2000-2005. In each year, firms in each country are divided into four categories according to their payout policy: (A) a policy that distributes nothing (DIVR=0, REPR=0); (B) a policy that distributes cash only through dividends (DIVR>0, REPR=0); (C) a policy that distributes cash only through share repurchases (DIVR=0, REPR>0); and (D) a policy that uses both dividends and share repurchases (DIVR>0, REPR>0).

		(A) DIVR=0,REPR=0			*(B) DIVR>0, REPR=0*			*(C) DIVR=0, REPR>0*			*(D) DIVR>0, REPR>0*		
Country	Variable	mean	median	nobs	mean	median	nobs	mean	median	nobs	mean	median	nobs
Australia	TA (mil U$)	12.20	11.63	1193	132.11	104.43	1185	21.31	17.05	62	292.00	205.83	202
	MBR	3.37	1.56	1590	2.59	1.61	1171	3.01	1.16	69	2.04	1.39	194
	CASH (%)	27.90	17.01	1760	10.95	4.83	1198	28.15	20.72	74	12.89	6.86	198
	ROA	-0.40	-0.14	1610	0.11	0.09	1177	-0.13	-0.02	69	0.11	0.09	200
	LEVER (%)	22.97	0.00	1691	40.55	24.84	1205	34.17	0.01	75	31.38	19.52	204
	SRET (%)	14.49	-11.11	1575	32.26	18.33	1081	31.85	8.42	68	22.77	10.53	188
	NOPER (%)	3.66	0.68	1744	2.03	0.62	1191	1.29	0.32	74	3.22	1.12	199
	RE/TE	-4.44	-1.28	1660	0.10	0.17	1196	-2.24	-0.71	72	-0.02	0.15	202
	ROAVOL (%)	50.81	22.87	606	6.89	3.19	711	33.49	22.23	28	9.84	4.63	157
Canada	TA (mil U$)	52.11	54.27	1082	419.70	374.43	555	107.04	85.51	228	884.09	986.10	208
	MBR	4.28	2.25	1204	2.18	1.58	535	2.35	1.50	216	1.96	1.68	206
	CASH (%)	24.99	14.82	1458	5.76	1.25	556	20.23	7.83	237	6.01	1.99	208
	ROA	-0.28	-0.05	1393	0.09	0.07	552	0.03	0.07	228	0.10	0.09	209
	LEVER (%)	29.90	0.59	1407	53.53	32.37	558	48.23	13.13	235	84.24	46.28	211
	SRET (%)	45.84	2.24	1139	27.51	22.04	469	20.20	6.85	200	25.47	16.20	199
	NOPER (%)	0.48	0.00	1463	0.20	0.00	554	0.47	0.00	237	0.34	0.00	212
	RE/TE	-2.57	-0.50	1363	0.19	0.14	505	-0.40	0.11	234	0.39	0.45	201
	ROAVOL (%)	26.52	11.55	676	5.41	3.39	318	10.25	6.18	126	4.05	2.73	172
France	TA (mil U$)	69.64	56.51	563	449.59	339.09	931	90.31	59.58	65	1444.03	1598.22	238
	MBR	3.64	1.72	472	2.83	1.70	902	2.93	1.58	56	2.33	1.83	235
	CASH (%)	15.11	8.80	567	13.42	10.22	925	27.68	18.53	63	13.85	10.83	233
	ROA	-0.08	0.01	536	0.09	0.08	884	-0.03	0.00	59	0.08	0.07	229
	LEVER (%)	78.34	23.68	511	57.43	29.04	928	14.37	2.79	59	63.98	39.63	237
	SRET (%)	0.65	-17.88	510	21.64	10.71	879	10.76	0.09	59	22.80	12.48	232
	NOPER (%)	2.12	0.68	567	1.67	0.82	931	1.66	0.52	65	0.99	0.42	238
	RE/TE	-0.82	-0.04	500	0.15	0.13	909	-0.17	-0.04	57	0.19	0.12	217
	ROAVOL (%)	19.38	8.44	443	3.35	2.26	777	13.69	12.39	45	3.38	2.22	208
Germany	TA (mil U$)	126.90	105.54	831	692.06	481.61	916	116.31	87.88	110	858.07	536.36	158
	MBR	2.81	1.32	740	2.43	1.72	892	2.95	1.28	101	2.73	1.61	155
	CASH (%)	20.39	10.12	819	11.09	6.57	857	29.76	23.44	110	16.14	9.86	158
	ROA	-0.10	-0.01	790	0.08	0.07	892	-0.05	0.01	93	0.12	0.09	158

	LEVER (%)	60.06	11.30	798	74.22	33.13	908	21.13	1.19	110	33.56	9.20	158
	SRET (%)	-8.43	-25.42	725	15.61	6.08	878	0.68	-16.66	82	19.39	1.44	149
	NOPER (%)	3.01	1.71	834	2.89	2.14	913	1.59	0.73	110	3.15	2.06	158
	RE/TE	-1.53	-0.12	789	0.38	0.40	903	-0.57	-0.01	108	0.41	0.52	158
	ROAVOL (%)	18.22	11.15	605	4.54	2.36	809	16.79	11.33	56	5.46	3.73	148
Japan	TA (mil U$)	460.43	516.24	799	754.56	667.73	3010	414.95	406.66	436	787.89	648.42	4535
	MBR	2.47	1.07	706	1.92	1.17	2808	2.92	0.92	427	1.53	1.00	4491
	CASH (%)	16.14	11.60	799	16.57	13.17	3006	14.07	10.51	436	17.64	14.08	4501
	ROA	-0.01	0.01	785	0.05	0.04	2988	-0.03	0.00	435	0.05	0.04	4513
	LEVER (%)	161.36	72.99	773	66.12	25.08	3005	110.58	42.01	429	35.92	13.79	4531
	SRET (%)	2.51	-15.19	700	18.95	1.95	2680	2.92	-12.75	431	18.36	3.64	4414
	NOPER (%)	0.29	0.11	798	0.13	0.03	3004	-0.06	0.02	435	0.14	0.08	4535
	RE/TE	-0.78	0.01	752	0.48	0.53	2967	-0.89	0.00	427	0.51	0.54	4525
	ROAVOL (%)	6.47	3.75	668	2.71	1.99	2498	8.86	4.61	414	3.01	2.16	4234
UK	TA (mil U$)	20.68	18.58	2152	191.89	152.32	2919	84.39	78.23	207	346.84	287.40	884
	MBR	4.33	1.75	2041	2.86	1.46	2793	1.83	0.88	198	2.10	0.93	851
	CASH (%)	27.52	15.24	2464	10.92	6.05	2833	19.61	7.51	216	10.17	6.30	879
	ROA	-0.35	-0.09	2434	0.08	0.07	2897	-0.03	0.00	216	0.08	0.05	877
	LEVER (%)	27.59	0.23	2330	43.37	14.97	2869	27.12	0.25	214	32.22	11.32	865
	SRET (%)	11.56	-16.30	1896	20.06	10.55	2739	8.17	-3.08	187	15.59	7.99	850
	NOPER (%)	0.66	0.00	2424	0.47	0.00	2912	0.70	0.00	216	0.46	0.00	882
	RE/TE	-2.56	-0.36	2245	0.23	0.36	2855	-0.65	-0.02	213	0.25	0.19	864
	ROAVOL (%)	41.99	18.56	1345	6.22	3.59	2456	16.63	3.94	134	3.79	1.66	742
US	TA (mil U$)	43.27	53.78	12611	648.04	711.14	2442	183.84	193.47	4564	1156.67	1167.13	3097
	MBR	5.47	2.23	10012	2.46	1.75	2334	3.55	1.97	4138	3.35	2.21	3023
	CASH (%)	27.63	15.16	13476	10.79	4.00	2281	25.48	17.40	4504	11.48	5.75	2845
	ROA	-0.58	-0.04	12837	0.08	0.07	2396	-0.02	0.07	4249	0.12	0.11	2991
	LEVER (%)	51.91	2.26	12201	83.04	48.22	2427	49.86	6.31	4438	58.80	32.13	3067
	SRET (%)	37.60	-0.08	11070	23.55	14.56	2273	23.18	3.44	4106	17.37	11.61	2989
	NOPER (%)	0.61	0.00	13623	0.37	0.00	2442	0.57	0.00	4597	0.36	0.00	3082
	RE/TE	-3.37	-0.37	10888	0.50	0.65	2252	-0.58	0.22	4322	0.68	0.80	3030
	ROAVOL (%)	50.55	12.27	8238	4.58	3.04	2121	14.77	6.31	3204	4.25	3.01	2714

Table 7: Multinomial logit regression for firms using only share repurchases as the reference group

This table reports the results of multinomial logit regression using firms using only share repurchases as the reference group. Our sample is comprised of firm-year observations for seven major countries over the period 2000-2005. In each year, firms in each country are divided into four categories according to their payout policy: (A) a policy that distributes nothing (DIVR=0, REPR=0); (B) a policy that distributes cash only through dividends (DIVR>0, REPR=0); (C) a policy that distributes cash only through share repurchases (DIVR=0, REPR>0); and (D) a policy that uses both dividends and share repurchases (DIVR>0, REPR>0).

		(A) *DIVR=0,REPR=0*		*(B)* *DIVR>0,REPR=0*		*(D)* *DIVR>0,REPR>0*			
country	variable	coeff	prob	coeff	prob	coeff	prob	nobs	-2·Log
Australia	Intercept	3.07	(0.33)	-5.18	(0.11)	-14.20	(0.00)	1244	1676.5
	Log(TA)	-0.04	(0.83)	0.48	(0.01)	0.85	(0.00)		
	MBR	0.03	(0.76)	0.06	(0.56)	-0.04	(0.75)		
	CASH	-0.21	(0.83)	-2.12	(0.06)	0.22	(0.85)		
	ROA	-0.26	(0.68)	6.49	(0.00)	8.09	(0.00)		
	LEVER	0.00	(0.46)	0.00	(0.85)	-0.01	(0.34)		
	SRET	-0.00	(0.24)	-0.00	(0.70)	-0.00	(0.33)		
	NOPER	13.43	(0.00)	11.37	(0.01)	16.54	(0.00)		
	RE/TE	-0.07	(0.38)	0.43	(0.00)	0.00	(0.99)		
	ROAVOL	-0.02	(0.96)	-2.04	(0.00)	-0.52	(0.42)		
Canada	Intercept	2.81	(0.09)	-9.50	(0.00)	-16.59	(0.00)	1068	1941.6
	Log(TA)	-0.08	(0.38)	0.54	(0.00)	0.85	(0.00)		
	MBR	0.04	(0.44)	0.10	(0.09)	-0.21	(0.04)		
	CASH	-1.31	(0.02)	-3.10	(0.00)	-1.19	(0.28)		
	ROA	-4.05	(0.00)	4.98	(0.00)	5.14	(0.01)		
	LEVER	-0.00	(0.09)	-0.00	(0.10)	0.00	(0.06)		
	SRET	0.00	(0.35)	-0.00	(0.52)	0.00	(0.71)		
	NOPER	4.73	(0.27)	-1.37	(0.81)	4.17	(0.58)		
	RE/TE	-0.06	(0.35)	0.05	(0.74)	1.14	(0.00)		
	ROAVOL	2.03	(0.04)	-5.70	(0.00)	-7.73	(0.01)		
France	Intercept	6.78	(0.01)	-0.93	(0.70)	-9.18	(0.00)	1337	1957.6
	Log(TA)	-0.23	(0.07)	0.24	(0.06)	0.56	(0.00)		
	MBR	0.24	(0.04)	0.13	(0.25)	0.01	(0.96)		
	CASH	-5.93	(0.00)	-4.56	(0.00)	-3.24	(0.02)		
	ROA	-2.75	(0.09)	7.64	(0.00)	8.17	(0.00)		
	LEVER	0.01	(0.05)	0.01	(0.15)	0.01	(0.17)		
	SRET	-0.00	(0.23)	0.00	(0.86)	0.00	(0.44)		
	NOPER	1.00	(0.85)	-0.79	(0.88)	-10.29	(0.09)		
	RE/TE	-0.06	(0.82)	1.28	(0.01)	2.64	(0.00)		
	ROAVOL	-0.74	(0.72)	-18.56	(0.00)	-11.37	(0.00)		
Germany	Intercept	3.00	(0.17)	-0.08	(0.97)	-7.40	(0.00)	1482	2262.3
	Log(TA)	-0.02	(0.85)	0.15	(0.18)	0.43	(0.00)		
	MBR	-0.04	(0.44)	-0.04	(0.45)	-0.05	(0.35)		
	CASH	-2.43	(0.00)	-2.84	(0.00)	-0.82	(0.39)		
	ROA	-0.40	(0.61)	5.44	(0.00)	8.99	(0.00)		
	LEVER	0.00	(0.38)	0.00	(0.18)	-0.00	(0.15)		
	SRET	-0.00	(0.31)	0.00	(0.20)	0.00	(0.56)		

	NOPER	1.10	(0.74)	1.98	(0.58)	0.08	(0.98)		
	RE/TE	-0.15	(0.14)	1.49	(0.00)	1.03	(0.00)		
	ROAVOL	0.59	(0.53)	-4.61	(0.00)	-3.85	(0.04)		
Japan	Intercept	-4.78	(0.00)	-10.79	(0.00)	-10.21	(0.00)	7705	13754.6
	Log(TA)	0.25	(0.00)	0.58	(0.00)	0.58	(0.00)		
	MBR	-0.07	(0.02)	0.13	(0.00)	0.02	(0.60)		
	CASH	1.28	(0.08)	2.11	(0.00)	2.92	(0.00)		
	ROA	-0.52	(0.43)	8.20	(0.00)	9.45	(0.00)		
	LEVER	0.00	(0.00)	-0.00	(0.03)	-0.00	(0.00)		
	SRET	0.00	(0.04)	0.00	(0.00)	0.01	(0.00)		
	NOPER	4.97	(0.04)	-0.85	(0.01)	-9.60	(0.00)		
	RE/TE	-0.03	(0.34)	2.47	(0.00)	2.50	(0.00)		
	ROAVOL	-0.45	(0.35)	-11.25	(0.00)	-7.15	(0.00)		
UK	Intercept	7.60	(0.00)	2.82	(0.01)	-2.73	(0.02)	4287	6987.5
	Log(TA)	-0.36	(0.00)	-0.04	(0.51)	0.21	(0.00)		
	MBR	0.66	(0.00)	0.72	(0.00)	0.66	(0.00)		
	CASH	-1.51	(0.00)	-2.19	(0.00)	-1.28	(0.04)		
	ROA	-3.71	(0.00)	3.97	(0.00)	5.56	(0.00)		
	LEVER	0.00	(0.20)	0.00	(0.15)	-0.00	(0.65)		
	SRET	0.00	(0.97)	-0.00	(0.46)	-0.00	(0.43)		
	NOPER	5.61	(0.03)	-2.73	(0.31)	-4.26	(0.17)		
	RE/TE	0.05	(0.32)	0.54	(0.00)	0.14	(0.05)		
	ROAVOL	0.29	(0.41)	-3.36	(0.00)	-9.04	(0.00)		
US	Intercept	4.24	(0.00)	-2.50	(0.00)	-6.88	(0.00)	1347	27598.8
	Log(TA)	-0.19	(0.00)	0.13	(0.00)	0.33	(0.00)		
	MBR	-0.01	(0.03)	-0.05	(0.00)	-0.01	(0.20)		
	CASH	-0.53	(0.00)	-1.44	(0.00)	-1.44	(0.00)		
	ROA	-1.62	(0.00)	-0.24	(0.53)	4.01	(0.00)		
	LEVER	0.00	(0.00)	0.00	(0.00)	-0.00	(0.04)		
	SRET	0.00	(0.00)	0.00	(0.00)	-0.00	(0.12)		
	NOPER	-0.02	(0.98)	2.47	(0.12)	0.82	(0.59)		
	RE/TE	-0.05	(0.00)	0.64	(0.00)	1.09	(0.00)		
	ROAVOL	0.26	(0.01)	-8.16	(0.00)	-8.03	(0.00)		

Table 8: Multinomial logit regression for firms using both share repurchases and dividends as the reference group

This table reports the results of multinomial logit regression using firms using both share repurchases and dividends as the reference group. Our sample is comprised of firm-year observations for seven major countries over the period 2000-2005. In each year, firms in each country are divided into four categories according to their payout policy: (A) a policy that distributes nothing (DIVR=0, REPR=0); (B) a policy that distributes cash only through dividends (DIVR>0, REPR=0); (C) a policy that distributes cash only through share repurchases (DIVR=0, REPR>0); and (D) a policy that uses both dividends and share repurchases (DIVR>0, REPR>0).

		(A) *DIVR=0,REPR=0*		*(B)* *DIVR>0,REPR=0*		*(C)* *DIVR=0,REPR>0*			
country	variable	coeff	Prob	coeff	prob	coeff	prob	nobs	-2·Log
Australia	Intercept	17.28	(0.00)	9.02	(0.00)	14.20	(0.00)	1244	1676.5
	Log(TA)	-0.89	(0.00)	-0.38	(0.00)	-0.85	(0.00)		
	MBR	0.06	(0.35)	0.09	(0.10)	0.04	(0.75)		
	CASH	-0.43	(0.57)	-2.34	(0.00)	-0.22	(0.85)		
	ROA	-8.35	(0.00)	-1.60	(0.17)	-8.09	(0.00)		
	LEVER	0.01	(0.00)	0.01	(0.04)	0.01	(0.34)		
	SRET	0.00	(0.98)	0.00	(0.30)	-0.00	(0.33)		
	NOPER	-3.11	(0.11)	-5.17	(0.00)	-16.54	(0.00)		
	RE/TE	-0.07	(0.29)	0.42	(0.00)	0.00	(0.99)		
	ROAVOL	0.50	(0.37)	-1.52	(0.03)	0.52	(0.42)		
Canada	Intercept	19.40	(0.00)	7.09	(0.00)	16.59	(0.00)	1068	1941.6
	Log(TA)	-0.93	(0.00)	-0.31	(0.00)	-0.85	(0.00)		
	MBR	0.25	(0.01)	0.31	(0.00)	0.21	(0.04)		
	CASH	-0.12	(0.91)	-1.90	(0.08)	1.19	(0.28)		
	ROA	-9.19	(0.00)	-0.15	(0.93)	-5.14	(0.01)		
	LEVER	-0.00	(0.00)	-0.00	(0.00)	-0.00	(0.06)		
	SRET	0.00	(0.81)	-0.00	(0.32)	-0.00	(0.71)		
	NOPER	0.57	(0.93)	-5.54	(0.40)	-4.17	(0.58)		
	RE/TE	-1.20	(0.00)	-1.09	(0.00)	-1.14	(0.00)		
	ROAVOL	9.76	(0.00)	2.03	(0.49)	7.73	(0.01)		
France	Intercept	15.96	(0.00)	8.25	(0.00)	9.18	(0.00)	1337	1957.6
	Log(TA)	-0.80	(0.00)	-0.32	(0.00)	-0.56	(0.00)		
	MBR	0.23	(0.00)	0.13	(0.01)	-0.01	(0.96)		
	CASH	-2.69	(0.02)	-1.32	(0.13)	3.24	(0.02)		
	ROA	-10.92	(0.00)	-0.53	(0.75)	-8.17	(0.00)		
	LEVER	0.00	(0.00)	0.00	(0.79)	-0.01	(0.17)		
	SRET	-0.01	(0.00)	-0.00	(0.23)	-0.00	(0.44)		
	NOPER	11.30	(0.00)	9.50	(0.00)	10.29	(0.09)		
	RE/TE	-2.70	(0.00)	-1.36	(0.00)	-2.64	(0.00)		
	ROAVOL	10.63	(0.00)	-7.19	(0.01)	11.37	(0.00)		
Germany	Intercept	10.40	(0.00)	7.32	(0.00)	7.40	(0.00)	1482	2262.3
	Log(TA)	-0.45	(0.00)	-0.28	(0.00)	-0.43	(0.00)		
	MBR	0.02	(0.70)	0.02	(0.63)	0.05	(0.35)		
	CASH	-1.61	(0.04)	-2.02	(0.01)	0.82	(0.39)		
	ROA	-9.39	(0.00)	-3.55	(0.01)	-8.99	(0.00)		
	LEVER	0.01	(0.00)	0.01	(0.00)	0.00	(0.15)		

	SRET	-0.00	(0.07)	0.00	(0.41)	-0.00	(0.56)		
	NOPER	1.01	(0.72)	1.90	(0.45)	-0.08	(0.98)		
	RE/TE	-1.18	(0.00)	0.46	(0.16)	-1.03	(0.00)		
	ROAVOL	4.45	(0.01)	-0.75	(0.66)	3.85	(0.04)		
Japan	Intercept	5.43	(0.00)	-0.58	(0.19)	10.21	(0.00)	7705	13754.6
	Log(TA)	-0.33	(0.00)	0.00	(0.92)	-0.58	(0.00)		
	MBR	-0.09	(0.03)	0.11	(0.00)	-0.02	(0.60)		
	CASH	-1.64	(0.00)	-0.81	(0.00)	-2.92	(0.00)		
	ROA	-9.97	(0.00)	-1.26	(0.04)	-9.45	(0.00)		
	LEVER	0.01	(0.00)	0.00	(0.00)	0.00	(0.00)		
	SRET	-0.00	(0.00)	-0.00	(0.16)	-0.01	(0.00)		
	NOPER	14.57	(0.00)	1.55	(0.39)	9.60	(0.00)		
	RE/TE	-2.53	(0.00)	-0.03	(0.81)	-2.50	(0.00)		
	ROAVOL	6.70	(0.00)	-4.11	(0.00)	7.15	(0.00)		
UK	Intercept	10.33	(0.00)	5.55	(0.00)	2.73	(0.02)	4287	6987.5
	Log(TA)	-0.57	(0.00)	-0.25	(0.00)	-0.21	(0.00)		
	MBR	-0.00	(0.86)	0.06	(0.00)	-0.66	(0.00)		
	CASH	-0.22	(0.62)	-0.90	(0.02)	1.28	(0.04)		
	ROA	-9.27	(0.00)	-1.59	(0.02)	-5.56	(0.00)		
	LEVER	0.00	(0.00)	0.00	(0.00)	0.00	(0.65)		
	SRET	0.00	(0.19)	0.00	(0.84)	0.00	(0.43)		
	NOPER	9.88	(0.00)	1.53	(0.40)	4.26	(0.17)		
	RE/TE	-0.10	(0.11)	0.40	(0.00)	-0.14	(0.05)		
	ROAVOL	9.32	(0.00)	5.68	(0.00)	9.04	(0.00)		
US	Intercept	11.12	(0.00)	4.39	(0.00)	6.88	(0.00)	1347	27598.8
	Log(TA)	-0.51	(0.00)	-0.20	(0.00)	-0.33	(0.00)		
	MBR	-0.00	(0.93)	-0.03	(0.00)	0.01	(0.20)		
	CASH	0.90	(0.00)	-0.01	(0.98)	1.44	(0.00)		
	ROA	-5.64	(0.00)	-4.25	(0.00)	-4.01	(0.00)		
	LEVER	0.00	(0.00)	0.00	(0.00)	0.00	(0.04)		
	SRET	0.00	(0.00)	0.00	(0.00)	0.00	(0.12)		
	NOPER	-0.84	(0.58)	1.65	(0.37)	-0.82	(0.59)		
	RE/TE	-1.14	(0.00)	-0.45	(0.00)	-1.09	(0.00)		
	ROAVOL	8.28	(0.00)	-0.13	(0.89)	8.03	(0.00)		

Table 9: Tobit regressions for the amount of repurchases

This table reports the results of Tobit regressions. The dependent variable is the amount of repurchases (REPR), i.e., the amount of repurchases scaled by total assets. The definitions of the explanatory variables are provided in Table 1 except for DIVR_L. DIVR_L is the lagged dividend ratio (i.e, cash dividends in the previous year deflated by total assets) The sample includes firm-year observations from seven major countries over the period 2000-2005. Panel (1) analyzes all firm-years; Panel (2) analyzes firm-years that pay dividends; and Panel (3) analyzes firm-years that do not pay dividends. *, ** and *** indicate significance of χ^2 test at the 10%, 5% and 1% levels, respectively. The numbers in parentheses are χ^2 statistics. -2·Log is -2 times log likelihood ratio.

		(1) All Firms		*(2) Firms with DIVR>0*		*(3) Firms with DIVR=0*	
Country	Variable	Coeff.	χ^2 stat.	Coeff.	χ^2 stat.	Coeff.	χ^2 stat.
Australia	Intercept	-0.35***	(48.42)	-0.35***	(39.67)	-0.18	(1.51)
	Log(TA)	0.01***	(28.74)	0.01***	(26.17)	0.00	(0.10)
	MBR	-0.00	(1.69)	-0.00	(1.18)	-0.00	(0.06)
	CASH	0.07***	(9.44)	0.10***	(9.48)	0.04	(0.85)
	ROA	0.06**	(5.10)	0.14***	(7.19)	0.02	(0.58)
	LEVER	-0.00**	(6.54)	-0.00**	(5.09)	-0.00	(0.56)
	SRET	0.00	(0.46)	-0.00	(0.08)	0.00	(1.02)
	NOPER	0.09	(2.13)	0.19**	(6.55)	-0.45**	(5.18)
	RE/TE	0.00	(0.05)	-0.01***	(6.64)	0.00	(0.85)
	ROAVOL	0.01	(1.93)	0.05*	(3.55)	0.01	(0.11)
	DIVR_L	-0.03	(0.05)	-0.20	(1.72)	-1.16	(1.02)
	-2·Log	-97.96		-39.10		-30.44	
	nobs	1239		821		418	
Canada	Intercept	-0.18***	(49.84)	-0.15***	(19.43)	-0.12**	(6.55)
	Log(TA)	0.01***	(35.62)	0.01***	(17.16)	0.00	(2.49)
	MBR	-0.00	(0.41)	-0.00**	(3.89)	0.00	(0.46)
	CASH	0.04***	(12.31)	0.07***	(6.89)	0.04***	(8.40)
	ROA	0.07***	(15.66)	0.02	(0.18)	0.09***	(15.66)
	LEVER	0.00	(2.53)	0.00	(0.43)	0.00	(1.50)
	SRET	-0.00	(0.25)	0.00	(1.36)	-0.00	(1.54)
	NOPER	-0.02	(0.05)	0.07	(0.18)	-0.05	(0.21)
	RE/TE	0.00	(1.68)	0.00	(0.44)	0.00	(1.19)
	ROAVOL	-0.03*	(3.10)	0.09*	(3.42)	-0.05**	(4.67)
	DIVR_L	-0.46***	(20.92)	-0.50***	(20.21)	-0.13	(0.01)
	-2·Log	189.70		168.44		38.65	
	nobs	1064		452		612	
France	Intercept	-0.22***	(69.53)	-0.20***	(47.93)	-0.25***	(8.65)
	Log(TA)	0.01***	(40.24)	0.01***	(28.63)	0.01**	(4.53)
	MBR	-0.00***	(13.80)	-0.00**	(5.05)	-0.01**	(5.90)
	CASH	0.10***	(33.98)	0.03	(2.41)	0.17***	(24.83)
	ROA	0.04	(1.69)	0.05	(1.33)	0.07	(1.99)
	LEVER	-0.00	(1.44)	-0.00	(0.08)	-0.00**	(4.57)
	SRET	0.00**	(4.30)	0.00	(0.05)	0.00**	(5.01)
	NOPER	-0.20***	(7.93)	-0.25***	(8.18)	-0.09	(0.49)
	RE/TE	0.01	(2.02)	0.02**	(3.86)	0.00	(0.08)
	ROAVOL	0.09***	(9.57)	0.22***	(12.35)	0.05	(0.54)
	DIVR_L	0.18	(1.94)	0.13	(0.97)	-0.39	(0.27)
	-2·Log	41.69		62.07		3.21	

	nobs	1332		925		407	
Germany	Intercept	-0.14***	(41.29)	-0.16***	(34.67)	-0.06	(1.41)
	Log(TA)	0.00***	(17.29)	0.01***	(18.17)	-0.00	(0.01)
	MBR	0.00	(2.57)	0.00	(0.01)	0.00	(1.22)
	CASH	0.07***	(39.45)	0.07***	(17.52)	0.07***	(17.46)
	ROA	0.06***	(12.87)	0.15***	(18.41)	0.02	(1.95)
	LEVER	-0.00***	(11.42)	-0.00***	(12.13)	-0.00	(0.70)
	SRET	0.00	(0.33)	-0.00	(0.37)	0.00	(0.91)
	NOPER	-0.03	(0.33)	-0.02	(0.16)	-0.07	(1.24)
	RE/TE	0.00	(1.27)	-0.01	(2.61)	0.00	(2.12)
	ROAVOL	-0.00	(0.00)	0.02	(0.34)	-0.01	(0.33)
	DIVR_L	-0.06	(0.48)	-0.21**	(4.01)	-0.50	(2.12)
	-2·Log	32.69		51.56		-4.14	
	nobs	1468		882		586	
Japan	Intercept	-0.02***	(31.52)	-0.02***	(37.61)	0.00	(0.22)
	Log(TA)	0.00***	(16.92)	0.00***	(22.95)	-0.00	(2.26)
	MBR	-0.00	(0.75)	-0.00***	(17.02)	0.00***	(10.00)
	CASH	0.02***	(85.80)	0.02***	(63.29)	0.02***	(11.95)
	ROA	0.01***	(20.15)	0.02***	(26.91)	0.01*	(3.37)
	LEVER	-0.00***	(117.99)	-0.00***	(72.06)	-0.00***	(10.25)
	SRET	-0.00	(1.11)	-0.00	(0.05)	-0.00***	(9.45)
	NOPER	-0.02**	(4.48)	-0.01	(0.35)	-0.03	(2.63)
	RE/TE	-0.00	(1.51)	-0.00	(1.68)	0.00	(2.40)
	ROAVOL	0.01***	(7.15)	0.06***	(56.18)	0.00	(0.21)
	DIVR_L	0.24***	(66.42)	0.20***	(37.79)	-0.04	(0.04)
	-2·Log	10803.10		9947.57		941.55	
	nobs	7702		6650		1052	
UK	Intercept	-0.26***	(184.13)	-0.21***	(104.49)	-0.39***	(33.10)
	Log(TA)	0.01***	(121.34)	0.01***	(71.86)	0.02***	(25.40)
	MBR	-0.00***	(15.23)	-0.00***	(7.40)	-0.03***	(17.08)
	CASH	0.03***	(8.13)	0.03*	(3.66)	0.10***	(16.45)
	ROA	0.11***	(32.16)	0.04	(2.50)	0.21***	(21.33)
	LEVER	-0.00***	(21.33)	-0.00***	(27.61)	-0.00***	(9.23)
	SRET	-0.00	(1.99)	-0.00	(0.43)	-0.00	(0.03)
	NOPER	-0.14***	(6.89)	-0.06	(0.80)	-0.27***	(5.18)
	RE/TE	-0.00**	(6.23)	-0.01***	(35.31)	0.00	(0.29)
	ROAVOL	-0.02**	(5.56)	-0.09***	(14.20)	0.00	(0.05)
	DIVR_L	-0.02	(0.08)	0.10	(1.29)	-1.40*	(3.18)
	-2·Log	-99.31		25.84		-67.34	
	nobs	4276		3032		1244	
US	Intercept	-0.17***	(570.67)	-0.11***	(120.55)	-0.21***	(353.45)
	Log(TA)	0.01***	(432.74)	0.00***	(90.63)	0.01***	(247.19)
	MBR	0.00***	(253.20)	0.00***	(176.75)	0.00***	(74.30)
	CASH	0.03***	(54.00)	0.03***	(17.37)	0.03***	(35.90)
	ROA	0.08***	(408.65)	0.23***	(311.09)	0.07***	(210.42)
	LEVER	-0.00***	(203.80)	-0.00***	(109.94)	-0.00***	(76.53)
	SRET	-0.00***	(85.76)	-0.00***	(18.20)	-0.00***	(47.42)
	NOPER	-0.01	(0.08)	-0.11**	(5.84)	0.02	(0.24)
	RE/TE	0.00***	(37.84)	0.00***	(6.74)	0.00***	(21.34)
	ROAVOL	-0.01***	(11.70)	0.00	(0.03)	-0.01***	(9.95)
	DIVR_L	0.09**	(5.78)	-0.31***	(54.54)	0.15	(0.17)
	-2·Log	3302.72		2752.62		845.13	
	nobs	12945		4172		8773	

Figure 1 Cash holdings of repurchase-initiating firms that do not pay dividends.

The graph plots the median value of relative cash holdings for repurchase-initiating firm-years that do not pay dividends (•) for each year over a five-year period from year -4 through year 0. Year 0 is the event year in which a firm initiates repurchases. For comparison, the graph also plots the median value of relative cash holdings for no-payout firm-years (◊). We set the level of cash holdings (i.e., cash scaled by total assets) at the beginning of the five-year period (i.e., year -4) to 100, in order to standardize across firms that may have different levels of cash holdings. Thus, relative cash holdings in each year are the level of cash holdings in that year relative to the beginning-of-the-five-year level. In this graph, repurchase-initiating firm-years are those in which firms repurchase shares in year 0 but do not repurchase in any year from year -4 through year -1, and that do not pay dividends in any year from year -4 through year 0. No-payout firm-years are those in which firms do not make any payouts in any year from year -4 through year 0. Over the sample period 2000-2005, there are a total of 1,267 repurchase-initiating firm-years that do not pay dividends and 12,678 no-payout firm-years from the seven major countries. For each sample country, the numbers of repurchase-initiating firm-years that do not pay dividends and no-payout firm-years are 16 and 494 in Australia; 39 and 619 in Canada; 2 and 106 in France; 7 and 233 in Germany; 2 and 195 in Japan; 41 and 865 in the U.K.; and 1,160 and 10,166 in the U.S., respectively.

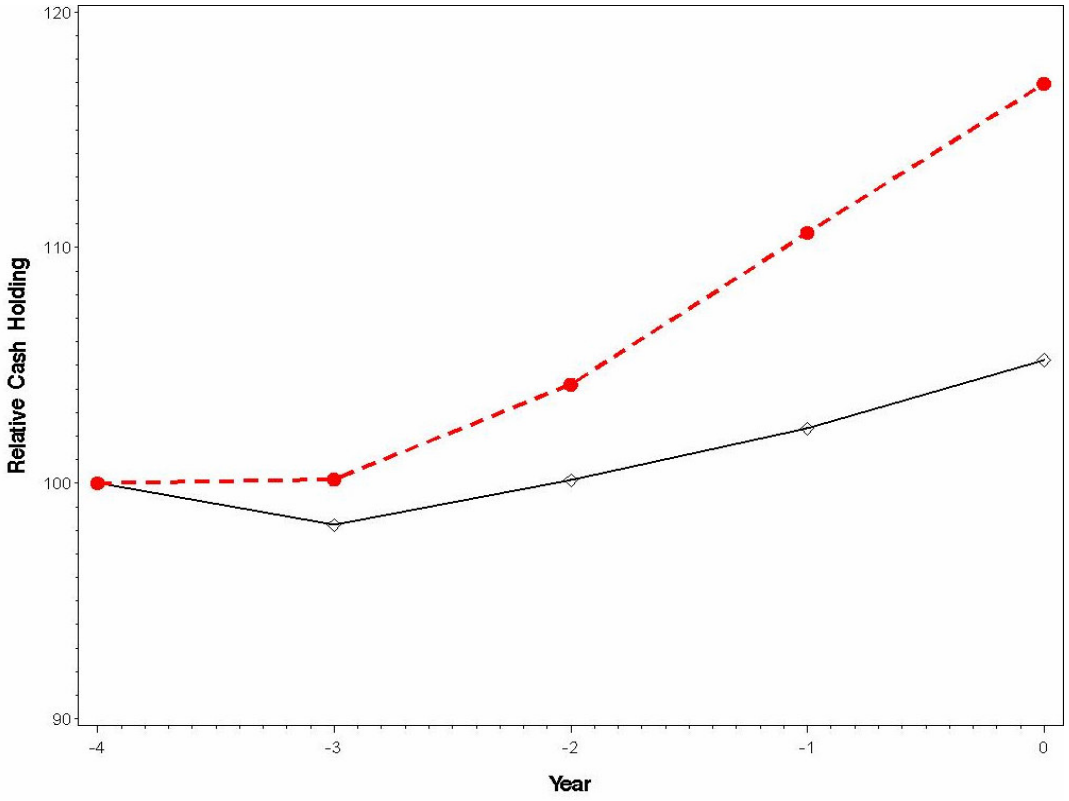

Figure 2 Cash holdings of repurchase-initiating firms that pay dividends

The graph plots the median value of relative cash holdings for repurchase-initiating firm-years that pay dividends (•) for each year over a five-year period from year -4 through year 0. Year 0 is the event year in which a firm initiates repurchases. For comparison, the graph also plots the median value of relative cash holdings for dividend-paying firm-years that do not repurchase shares (◊). We set the level of cash holdings (i.e., cash scaled by total assets) at the beginning of the five-year period (i.e., year -4) to 100, in order to standardize across firms that may have different levels of cash holdings. Thus, relative cash holdings in each year are the level of cash holdings in that year relative to the-beginning-of-the-five-year level. In this graph, repurchase-initiating firm-years are those in which firms repurchase shares in year 0 but do not repurchase in any year from year -4 through year -1, and that pay dividends in every year from year -4 through year 0. Dividend-paying firm-years are those in which firms pay dividends in every year from year -4 through year 0, but that do not repurchase shares in any year from year -4 through year 0. Over the sample period 2000-2005, there are a total of 818 repurchase-initiating firm-years that pay dividends and 5,781 firm-years that only pay dividends. For each sample country, the numbers of repurchase-initiating firm-years that also pay dividends and dividend-paying firms that do not repurchase shares are 44 and 523 in Australia; 21 and 206 in Canada; 49 and 369 in France; 25 and 430 in Germany; 209 and 978 in Japan; 261 and 2,047 in the U.K.; and 209 and 1,228 in the U.S., respectively.

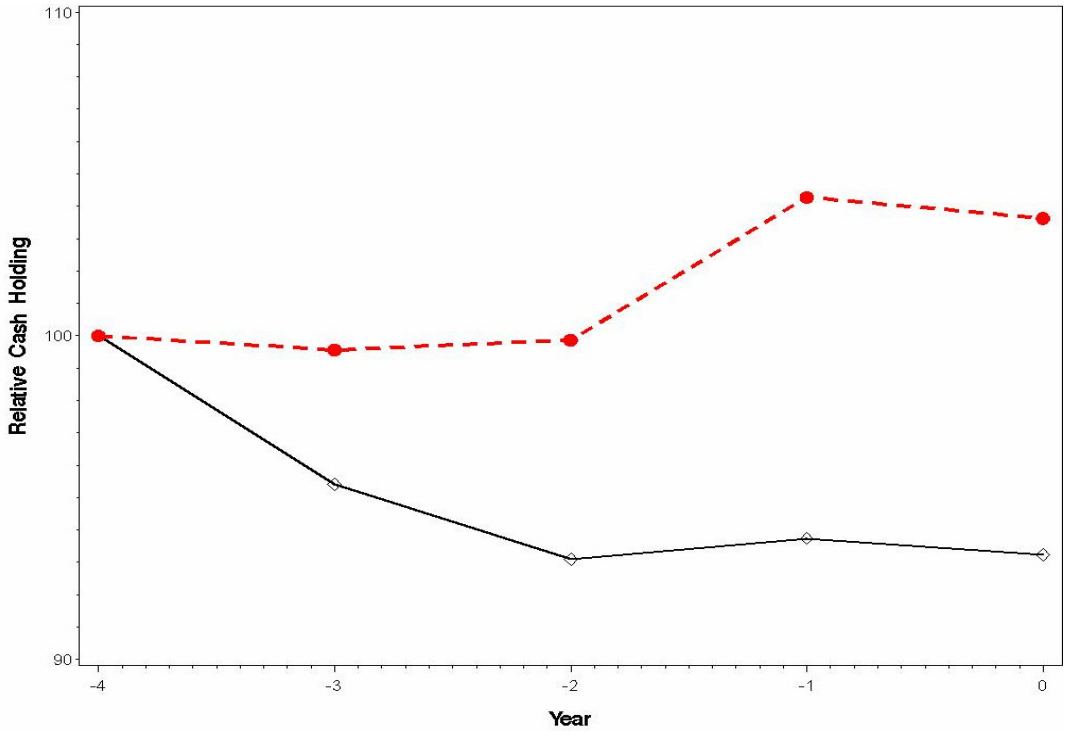

Figure 3 Cash holdings of firms that increase dividends

The graph plots the median value of relative cash holdings for two types of dividend-increasing firm-years for each year over a five-year period from year -4 through year 0. Year 0 is the event year in which a firm increases dividends, either substantially or routinely. Firm-years that make a substantial increase in dividend payouts (Δ) are those in which firms increase in dividends in year 0 is greater than the increase in the previous year (i.e., year -1). Firm-years that make a routine increase in dividend payouts (*) are those in which firms increase dividends in year 0, but not substantially. We set the level of cash holdings (i.e., cash scaled by total assets) at the beginning of the five-year period (i.e., year -4) to 100, in order to standardize across firms that may have different levels of cash holdings. Thus, relative cash holdings in each year are the level of cash holdings in that year relative to the-beginning-of-the-five-year level. Over the sample period 2000-2005, there are a total of 6,853 firm-years that make a substantial increase in dividend payouts and 3,068 firm-years that make a routine increase in dividend payouts for the seven sample countries. For each sample country, the numbers of substantial-dividend increasing and routine-dividend-increasing firm-years are 314 and 185 in Australia; 158 and 83 in Canada; 437 and 235 in France; 311 and 139 in Germany; 2,372 and 768 in Japan; 1,372 and 714 in the U.K.; and 1,899 and 944 in the U.S., respectively.