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# Financial flexibility and the choice between dividends and stock repurchases<sup>☆</sup>

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## Abstract

This paper measures the growth in open market stock repurchases and the manner in which stock repurchases and dividends are used by U.S. corporations. Stock repurchases and dividends are used at different times from one another, by different kinds of firms. Stock repurchases are very pro-cyclical, while dividends increase steadily over time. Dividends are paid by firms with higher “permanent” operating cash flows, while repurchases are used by firms with higher “temporary”, non-operating cash flows. Repurchasing firms also have much more volatile cash flows and distributions. Finally, firms repurchase stock following poor stock market performance and increase dividends following good performance. These results are consistent with the view that the flexibility inherent in repurchase programs is one reason why they are sometimes used instead of dividends. © 2000 Elsevier Science S.A. All rights reserved.

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## 1. Introduction

One of the most significant trends in corporate finance during the 1990s is the increasing popularity of open market stock repurchase programs. Between 1985 and 1996, the number of open market repurchase program announcements by U.S. industrial firms has increased 650% from 115 to 755, and their announced value has increased 750% from \$15.4 billion to \$113 billion. Correspondingly, dividends have only risen by a factor of just over two during the same period; aggregate dividends for all industrial firms listed on Compustat have risen from \$67.6 billion to \$141.7 billion. Repurchases are clearly an increasingly important method of paying out cash to shareholders.

In this paper, we examine firms' decisions to distribute cash flows and their choices between paying out cash flows in the form of dividends or stock repurchases. Our goal is to assess the increasing importance of repurchases in payout decisions and to isolate factors that affect the choice between repurchases and dividends. Our primary hypothesis is that dividends represent an ongoing commitment and are used to distribute permanent cash flows, while repurchases are used to pay out cash flows that are potentially temporary. Repurchases thus preserve financial flexibility relative to dividends because they do not implicitly commit the firm to future payouts.

At least since Lintner (1956), firms have been reluctant to cut dividends and have been greeted by a significantly negative stock market reaction when they do; Ghosh and Woolridge (1988) and Denis et al. (1994) report an average stock price decline of about 6% on the three days surrounding the announcement of a dividend cut. Repurchases, on the other hand, involve no such commitment or risk. Firms sometimes announce programs but fail to repurchase any shares. Even if a firm completes a program, it is under no explicit or even implicit obligation to begin another new repurchase program. Given these market expectations, stock repurchases would be a sensible way for firms to pay out cash flows that have a high likelihood of not being sustainable.<sup>1</sup>

In Section 2 of the paper, we discuss the construction of a database of repurchase announcements and actual share repurchases for all U.S. public firms for the period 1985 to 1996. We begin with an initial sample of all repurchases programs announced from 1985 through 1996, as reported by Securities Data Company (SDC). Since it is not always possible to determine with publicly available information exactly how many shares a particular firm

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<sup>1</sup> This argument does not say anything about the reason for these expectations. Rather, at least since 1956 when Lintner published his famous paper, firms have been making such implicit commitments with their dividends and market expectations have grown very strong. As an illustration of these strong expectations, FPL Group in 1994 decreased their dividend by 32% and simultaneously announced their intention to pay out the cash as a repurchase instead. FPL's stock fell by 13.7% on the announcement of this change. (See Esty and Schreiber (1995) for more detail.)

purchased in a given year, we construct estimates of the upper and lower bounds of the number of shares repurchased by each of these firms that are listed on both Standard and Poor's Compustat database and the Center for Research in Securities Prices (CRSP) tapes. We use these estimates to calculate estimates of total payouts and the division of these payouts between dividends and stock repurchases.

In Section 3, we provide estimates of aggregate repurchases, as well as the aggregate value of other forms of payouts. We do so both to test the aggregate form of the flexibility hypothesis that repurchases are more pro-cyclical than dividends and because our estimates of repurchases are improvements on those in the literature. At an economy-wide level, we find that actual share repurchases have increased over our sample period and represent an economically important source of payouts. Over the period 1985 to 1996, aggregate actual share repurchases by industrial firms total between \$249 billion and \$339 billion. This corresponds to 53 to 72% of announced repurchase levels and 20 to 27% of aggregate dividends.

In contrast to dividends, which grow smoothly, aggregate share repurchases are volatile and vary considerably with the business cycle. Firms increase their repurchases disproportionately relative to dividends during boom times and reduce them more during recessions. Even though dividends continue to make up the majority of total payouts, repurchases are responsible for much of the year-to-year variation. Overall, repurchases have not replaced dividends as the primary payout vehicle. Even in 1996, which was the largest year for repurchases in this sample, dividends amounted to more than double the total actual share repurchases and 126% of the total announced share repurchases. Firms are still generally increasing dividends every year; the fact that they are doing so and not increasing repurchases even faster suggests that there still is a dividend puzzle.

Section 4 of the paper considers the cross-sectional determinants of payout policy. We first reexamine Lintner's (1956) famous arguments. Lintner's premise is that managers prefer to increase dividends regularly and avoid decreasing dividends if possible. These arguments predict that dividend increases will be made by firms with higher and more stable cash flows, that dividend increases will be related to permanent but not necessarily to temporary components of cash flow, and that dividend decreases will be less frequent than increases and accompanied by very poor performance. We test these predictions empirically and find them supported by the data. Our evidence is also consistent with the recent empirical work on the relation between dividend changes and future earnings (see Bernartzi et al., 1997; DeAngelo et al., 1996). Although dividends appear to be paid out of permanent earnings, we find little evidence of subsequent earnings improvements following dividend increases.

We then test the financial flexibility hypothesis cross-sectionally. In particular, we expect to observe firms choosing repurchases rather than dividends when the value of financial flexibility is highest; i.e. when there is a high likelihood that

the cash flows being paid out are temporary. We construct empirical measures of whether cash flow is more or less likely to be temporary, and use these measures to predict whether a payout-increasing firm is more or less likely to increase dividends, repurchases, or both in any given year. Such temporary cash flows are likely to occur when a firm's cash flows are made up of a higher proportion of non-operating income relative to operating income, when a firm's earnings volatility prior to the repurchase is high, and when the firm's future cash flows are expected to decrease. In our data, each of these measures increases the likelihood of a firm using repurchases rather than dividends as a means of distributing cash flows. These findings suggest that managers tend to use dividends to pay out permanent cash flows and repurchases to pay out temporary cash flows.<sup>2</sup>

## 2. Measuring share repurchases

Although open market stock repurchases are increasingly common and have recently received much publicity, they are surprisingly difficult to measure.<sup>3</sup> A firm can legally repurchase its own stock whenever it chooses without announcing its intention to do so; however, by announcing a repurchase program the firm protects itself from liability under the stock price anti-manipulation provision of the Securities and Exchange Act.<sup>4</sup> Since announcing a repurchase program is essentially costless to the firm, making such an announcement would appear to be the dominant strategy for firms that are planning to repurchase stock.<sup>5</sup> There is little evidence of firms repurchasing

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<sup>2</sup> Guay and Harford (2000) report similar conclusions using a different empirical approach.

<sup>3</sup> See, for example, Hulbert (1997). Putting their money where their mouths are, *Forbes*, April 21, 1997.

<sup>4</sup> Although firms are not required to announce share repurchases, the announcement of a firm's intent to repurchase shares on the open market (or through privately negotiated transactions) is one of the safe harbor provisions under the stock price manipulation provisions of the Securities and Exchange Act. Additionally, a firm must satisfy the four criteria detailed in S.E.C. rule 10b-18 of the Securities and Exchange Commission's antimanipulation guidelines. These four criteria are: (1) on any one day, firms may not purchase more than 25% of the average daily volume of their own shares during the prior four weeks, block trades and privately negotiated transactions are exempt from this guideline; (2) firms may not purchase their own shares at the open, or during the last one-half hour of trading; (3) firms may not purchase their own shares at a price higher than the last independent bid, or the last reported sale price; and (4) all purchases on a single day must be executed through the same brokerage firm. This rule was adopted in 1982 and caused an increase in the number of open market repurchase programs adopted due to the resolution of the legal ambiguity (see Ikenberry et al., 1995).

<sup>5</sup> In terms of observable costs, dividend increases may also appear to be essentially costless; however, a dividend increase provides an explicit commitment to increase current payouts and an implicit commitment to keep future payouts at this increased level. An open market repurchase announcement provides no such commitments and there is no evidence of a reputational penalty for those firms failing to follow through with their announced repurchase program.

their own stock without having an announced program in place. Announcements are generally made to the various wire services, which are then collected in the Securities Data Company (SDC) database and are often reported in *The Wall Street Journal* and other business publications. SDC releases the aggregate dollar value of the repurchase announcements in its database to non-subscribers, and this number is often quoted as a measure of total stock repurchases (see Hulbert (1997); Hylton (1995); Power 1995)).<sup>6</sup>

In fact, there are a number of reasons why the total released by SDC does not accurately measure actual stock repurchases.<sup>7</sup> First and foremost, the announcements are simply a statement of the firm's intention to repurchase its stock; the firm is in no way obligated to do so. While the majority of firms follow through with their announced open market repurchase programs, a significant number of firms repurchase few or no shares. Stephens and Weisbach (1998) document that while most firms repurchase at least the number of shares originally announced over the subsequent three years and frequently repurchase more shares than originally announced, a significant number of firms repurchase very few or no shares. Generally, those firms repurchasing more shares than originally announced initiate subsequent repurchase programs or announce expansions of their existing programs, so it is reasonable to think of the announced value as an upper bound on the amount the firm will repurchase in a particular program.

Second, the aggregate dollar value of announced repurchase programs reported by SDC overstates the total value of the announced repurchase programs due to the way that the SDC constructs this figure. SDC includes announcements from a variety of sources, including wire services and *The Wall Street Journal*, so repurchase programs that are announced in more than one of the sources on different days are included multiple times by SDC. In addition, SDC includes announcements of withdrawn programs and privately negotiated repurchases into its figure. The privately negotiated repurchases are generally announced after the transaction has taken place and do not usually reflect any intention to repurchase additional shares.

Since share repurchases in the open market are neither observable at the time of the transaction nor are they always directly measurable subsequently, it is impossible to know with publicly available information exactly how many

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<sup>6</sup> In recent years it has become common for firms to disclose the number of shares repurchased on their 10-Ks and 10-Qs. In 1995 approximately 75% of a random sample of firms announcing open market repurchase programs made such disclosures. However, this appears to be a relatively recent phenomena; prior to 1992 very few firms disclosed any details of their repurchasing activities and almost none of the firms reported the number of shares repurchased on their 10-Ks or 10-Qs.

<sup>7</sup> SDC now includes actual share repurchases in their database back through 1994, but this is not the figure generally reported in the popular press.

shares were repurchased for all firms. Since 1984, firms have been required to report the value of their repurchases on their Statement of Cash Flows and this item is included in the Compustat database as “Purchases of Common and Preferred Stock” (data item # 115). However, this variable is an aggregation of many other types of transactions and overstates actual share repurchases, sometimes substantially. This aggregation includes conversions of other classes of stock into common stock, purchases of Treasury stock, retirements of common or preferred stock, and redemptions of redeemable preferred stock. The purchases of Treasury stock also include privately negotiated repurchases and self-tender offers in addition to open market repurchases. The privately negotiated transactions are often considerable; during our sample period there are \$53.2 billion in privately negotiated repurchases. Additionally, this aggregation will in some instances misrepresent the cost of a repurchase.<sup>8</sup> The combined overstatement of repurchases as reported to Compustat is potentially significant.

Stephens and Weisbach (1998) suggest an alternative method of measuring share repurchases, using the monthly decreases in shares outstanding as reported by CRSP adjusted for non-repurchase activity affecting shares outstanding such as stock splits and dividend reinvestment plans. Monthly decreases in shares outstanding are not offset with subsequent increases in shares outstanding since it is possible, even when a firm is actively repurchasing shares, for shares outstanding to increase as the result of exercise of executive stock options, distribution of Treasury shares to employee benefit plans or even contemporaneous stock issues. We improve on the Stephens and Weisbach (1998) CRSP measure of share repurchases by adjusting for new stock issues; 22 of the firms in our sample issue new seasoned equity while having an active open market repurchase program in place. It is not always possible, however, to determine how many shares were reissued to employee benefit plans or through the exercise of executive stock options. Hence, this measure will underestimate of share repurchases by the amount of shares contemporaneously reissued.

### **3. Estimates of aggregate repurchases and payouts**

#### *3.1. Repurchase announcements*

Table 1 presents estimates of the aggregate values of the various types of share repurchase announcements. The first column contains the number and value of

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<sup>8</sup> If the firm holds the shares as Treasury stock or retires the shares, then the value reported by the Compustat aggregation is an accurate reflection of the cost of acquiring the shares. However, if the shares are subsequently distributed to employee benefit plans, used for the exercise of stock options or reissued then this aggregation will also capture any change in market value since the time of the initial repurchase.

Table 1  
SDC repurchase program announcements

This table presents the number and value of all repurchase programs announced by industrial firms and reported by the Securities Data Company (SDC) for the period 1985 through 1996. The three most common methods used by firms to repurchase their stock (Dutch auctions, single-price tender offers and open market repurchase programs) are presented. The first four columns present the number and value of all open market, privately negotiated, Dutch auction and tender offer repurchase program announcements, respectively. The last five columns present alternative measures of the actual shares repurchased subsequent to the repurchase program announcement. Column 5 is the aggregate value of shares repurchased on the open market using the measure proposed by Stephens and Weisbach (1998). The value of share repurchases using this measure for only firms also listed in the Compustat database is reported in column 6. Column 7 presents the aggregate value of “Purchases of Common and Preferred Stock” (data item # 115) from the Compustat database for firms with announced repurchase programs; column 8 reports this measure less the value of Dutch auction and tender offer repurchases. Column 9 reports this measure for only firms that announced an open market repurchase program. All values are in millions of dollars.

Year	Open market repurchases				Measures of actual open market share repurchases								
	Distinct SDC announcements		Privately negotiated		Dutch auction repurchase programs		Single-price tender offer repurchases		CRSP				
	#	Value	#	Value	#	Value	#	Value	CRSP measure of share repurchases	CRSP repurchases – firms listed on Compustat	Value of stock repurchases reported by Compustat	Compustat repurchases – less Dutch auction, self tender & privately negotiated	Compustat repurchases – firms with announced open market repurchase programs
1985	115	15,416	55	4,146	5	1,092	69	16,639	5,100	4,839	50,418	28,541	8,886
1986	161	19,854	49	5,517	9	2,228	58	7,933	12,924	12,239	47,253	31,576	14,485
1987	606	41,019	34	2,791	8	1,494	57	5,741	11,120	10,568	57,298	47,272	28,888
1988	183	28,517	58	3,624	19	7,516	52	12,094	38,578	36,320	54,784	31,550	28,302
1989	356	52,574	91	3,116	19	4,985	81	3,322	24,970	24,597	59,995	48,572	33,539
1990	567	24,988	98	2,810	9	1,931	66	6,429	26,281	25,706	43,342	32,172	25,234
1991	211	13,872	93	4,007	4	739	66	4,290	9,076	9,005	28,048	19,012	16,361
1992	354	27,835	67	1,676	6	1,597	47	1,091	10,126	9,940	34,053	29,689	19,162
1993	324	28,831	70	2,210	5	604	43	553	16,667	16,111	37,168	33,801	24,635
1994	547	53,238	85	1,065	11	951	43	3,981	20,532	19,704	43,102	37,104	29,502
1995	574	52,343	85	12,951	8	1,444	34	1,553	35,690	35,132	78,427	62,479	46,486
1996	755	112,792	73	9,334	17	2,339	44	3,576	47,318	44,533	91,982	76,733	63,321
Total	4,753	471,279	858	53,247	120	26,920	660	67,202	258,382	248,694	625,870	478,501	338,801

distinct open market repurchase announcements as listed by SDC. SDC groups all announcements relating to open market programs into one category. In addition to announcements of open market programs, SDC includes announcements of program withdrawals and privately negotiated stock purchases.<sup>9</sup> We report the number and value of privately negotiated repurchases, as well as Dutch auction and single-price tender offer repurchases in Columns 2, 3, and 4 of Table 1.

Table 1 indicates that share repurchases have large fluctuations determined by economy-wide factors. In 1985, there were only 115 announcements of programs, compared with 755 in 1996.<sup>10</sup> In 1987 there was a sharp increase in program announcements, with 606 announcements. Many repurchase programs were initiated subsequent to the October market crash; 507 of the 606 repurchase programs announced in 1987 occurred after October 19 with 400 of these occurring between October 19 and October 31. The late 1980s contained a large number of announcements of open market programs, with a high of 567 in 1990. There was a decrease during the recession years of the early 1990s, with 211 announcements in 1991, 354 announcements in 1992 and 324 in 1993. However, since 1993 repurchase announcements have increased rapidly.

The relative popularity of other types of programs has also shifted over time. In the late 1980s, self-tender offers and Dutch auctions were relatively popular since many were used as takeover defenses. Another reason for the prevalence of self-tender offers was the leveraged recapitalizations common during this period. The largest years for self-tender offers, in value terms, were 1985 and 1988. Two cases led directly to such a large figure for 1985, Unocal's \$4.2 billion repurchase and Union Carbide's \$3.3 billion repurchase; Allegis' repurchase \$2.8 billion was the largest repurchase in 1988. In the 1990s, there have been more privately negotiated transactions, with their values rising substantially in 1995 and 1996.

### 3.2. *Values of repurchases*

We present estimates of the dollar values of actual repurchases in Columns 5 through 9 of Table 1. As discussed above, it is not always possible to know from

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<sup>9</sup> In addition, programs are included into this category multiple times if the program is reported in more than one source. There are a total of 93 repeat announcements and 34 withdrawn programs included in the SDC database, which are excluded from our statistical analysis. SDC's policy is to release only the total number and value from this category in their database to nonsubscribers, which has resulted in somewhat larger values reported in the press than are reported here.

<sup>10</sup> SDC started collecting repurchase announcements in 1985, so there is not a comprehensive listing of program announcements prior to 1985. However, it does appear that both the number and value of programs was substantially smaller prior to this point. For example, Vermaelen (1981) finds that only 198 NYSE firms initiated open market repurchase programs between 1970 and 1978. Grinblatt and Titman (1998) indicate that the dollar value of repurchases reported by Compustat is substantially smaller prior to 1985 as well (p. 521).



publicly available data exactly how many shares a firm repurchased in a given year. We present the CRSP repurchase measure suggested by Stephens and Weisbach (1998) with an adjustment for secondary equity offerings occurring during the program in Column 5. This measure provides a lower bound on the value of the repurchases. The total of \$258 billion of repurchases is approximately 55% of the total announced value of \$471 billion. This value understates the ultimate quantity of repurchases from these programs because it does not include all of the repurchases from programs begun at the end of the sample period. Since the two largest years for repurchase announcements were 1995 and 1996, together making up more than 35% of the value of all announcements, the total completion rate is likely to be similar to the 70 to 80% completion rates found by Stephens and Weisbach (1998).

The estimates of aggregate actual share repurchases in Column 5 of Table 1 suggest that repurchases vary substantially over time. The first few years of the sample appear to contain relatively few repurchases. However, we do not have data on program announcements prior to 1985, so the estimate for 1985 is likely to be particularly low since it only reflects repurchases from programs begun during that year. The post-crash announcements of 1987 led to a large number of repurchases in 1988, 1989, and 1990.<sup>11</sup> Repurchases slowed noticeably in the early 1990s and increased substantially in the mid-1990s. The numbers in Column 5 measure aggregate repurchases for all programs from firms on the CRSP tape. We are interested in relating these figures to other variables taken from Compustat; therefore, we present the CRSP measure for the subset of firms that are also on Compustat in Column 6 of Table 1. These numbers are similar, although slightly smaller, than those for the entire CRSP sample.

While the CRSP measure understates repurchases, the figure reported on Compustat overstates them because it includes a number of other items in addition to repurchases. We present Compustat's aggregate number in Column 7 of Table 1. This figure is considerably larger than the CRSP measure presented in Column 6. We adjust the Compustat number in two ways to measure actual repurchases more accurately. First, since the Compustat figure includes Dutch auctions, privately negotiated deals, and self-tender offers, we subtract them from the total and present the results in Column 8 of Table 1. Second, we restrict our calculations to include only firms that we know are actively repurchasing stock. Stephens and Weisbach (1998) find that most firms repurchase all of the stock they ultimately will during the two years subsequent

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<sup>11</sup> This finding contradicts the conclusions of Netter and Mitchell (1989). One potential explanation for the difference in findings is that Netter and Mitchell use just the change in the number of shares during the year as their measure of repurchases, while we use the month-to-month change. This approach understates repurchases if there is any redistributions of shares during the year, while ours understates it only if shares are redistributed in the same month (or quarter, if the firm only reports its outstanding shares quarterly).

to the initiation of a program. Consequently, we define a firm-year as having an active program as one in which a program is announced during that calendar year or one of the two previous years. We present the aggregate repurchase measure for firms with active programs defined this way in Column 9 of Table 1.

The estimates in Column 9, representing the Compustat repurchase measure for firms with active programs, are larger but of the same order of magnitude as the CRSP measure for the same group of firms presented in Column 6. This finding is not surprising given that the Compustat measure overstates repurchases while the CRSP measure understates it. A potentially troubling issue is that the aggregate Compustat repurchase measure is so much larger than the measure restricted to firms with active programs; the total difference between the two columns is around \$240 billion even after adjusting for Dutch auctions and self-tender offers. This difference could simply be due to the fact that the Compustat variable includes other components in addition to the repurchase variable. Alternatively, it could occur because a substantial number of firms repurchase stock without an announced repurchase program or repurchase program announcements are missing in the SDC database. We do not wish to dismiss this possibility, especially given that the incentive to announce a program for repurchasing comes from the safe harbor provisions of SEC Rule 10b-18 and that firms with repurchase programs appear to violate other provisions of this act (see Cook et al., 1997a).

Either of these possibilities implies that firms are repurchasing stock without a repurchase program listed by SDC. If so, the CRSP measures of actual share repurchases that only considers firms with such programs will understate aggregate repurchases. To gauge the extent of such understatement, we calculate the CRSP measure of repurchases based on drops in the number of shares outstanding for all firm-years without active programs, but with positive repurchases reported by Compustat. The total aggregated over all years, which should reflect the total value of privately negotiated repurchases, self-tender offers, Dutch auction repurchases, and unannounced open market repurchases during our sample period, is \$82 billion. This figure, which admittedly is an underestimate, is nonetheless substantially smaller than the sum total of the privately negotiated repurchases, self-tender offers, and Dutch auctions suggesting that the number of firms repurchasing stock without a program listed on SDC is relatively small.

Another issue is which of the two measures, the CRSP measure from Column 6 or the Compustat-based measure from Column 9, more accurately reflects actual repurchases. To compare the accuracy of these two measures we rely on survey data from Cook et al. (1997a,b), who requested data on actual repurchases from all firms starting programs in 1993 and received such data from 64 firms. Of these 64 firms, 35 had data on both CRSP and Compustat. We compare our measures of repurchases to each of the 64 firm-years reporting positive repurchases in the Cook et al. data set. The median CRSP measure is

68% of the median dollar value reported in the Cook et al. data, while the median Compustat measure is 113% of that value.<sup>12</sup> We interpret this finding as supportive of our argument that the CRSP measure underestimates repurchases while Compustat overstates repurchases, and suggests that the Compustat measure adjusted for program announcements is likely to be more accurate.

Table 2 documents the magnitude of several alternative payout methods. The first three columns contain the estimates of aggregate repurchases: the CRSP measure for all firms for which it can be computed, the CRSP measure for firms listed on Compustat, and the Compustat measure for all firms with active open market repurchase programs. The table also contains aggregate dividends for firms listed on Compustat and privately negotiated repurchases, self-tender offers, and Dutch auctions from SDC. Total payouts are the sum of aggregate dividends for firms listed on Compustat and the dollar value of open market repurchases, privately negotiated repurchases, self-tender offers, and Dutch auctions from SDC.

It is clear from Table 2 that repurchases are growing rapidly, but that dividends remain the predominate payout device. In 1996, dividends still account for 65% of total payouts, compared to 69% in 1985. In 1985, dividends paid by industrial firms listed on Compustat were between 8 and 13 times the value of actual share repurchases and 450% of the announced value of all share repurchase programs. At the end of the sample period dividends for industrial firms remain between 2 and 3 times as large as actual repurchases, regardless of whether one uses the underestimate or the overestimate to calculate repurchases, and 125% of the dollar amount of announced share repurchases. While repurchases have not nearly replaced dividends, the value of share repurchases has increased much more dramatically than the value of dividends. Even though repurchases are growing rapidly, dividends are as well; dividends for Compustat industrial firms grew almost 25% between 1992 and 1996 and have more than doubled over our entire sample period.

As has been recognized since at least Lintner (1956), dividends have historically been characterized by relatively steady growth. This description appears to characterize our sample period as well. Aggregate dividends paid by industrial firms listed on Compustat increased fairly steadily during our sample. Total payouts, however, were much more volatile than dividends. They dropped in a number of years, and, in fact, did not surpass 1988 levels until 1995. The source of this volatility is the other components of payouts, especially open market

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<sup>12</sup> We use medians rather than means because there appear to be a number of outliers that would make interpretation of averages difficult. For example, there were seven cases in which firms reported positive repurchases to Cook et al. (1997a,b) but reported zero on their financial statement for the variable that includes repurchases. There were two cases where the Stephens and Weisbach (1998) measure, which should understate repurchases, is greater than 500% of repurchases reported in the survey, which potentially means that the corporations only reported a fraction of their actual repurchases in their response to the request for data.

Table 2  
Payout measures and payout techniques

This table provides comparisons of the aggregate value of alternative payout measures and techniques. Column 1 is the aggregate value of shares repurchased on the open market using the measure proposed by Stephens and Weisbach (1998). The value of share repurchases using this measure for only firms also listed in the Compustat database is reported in column 2. Column 3 presents the aggregate value of "Purchases of Common and Preferred Stock" (data item # 115) from the Compustat database for firms with announced repurchase programs. The total aggregate amount of dividends paid for all firms listed on the Compustat Industrial, Full Coverage and Research files are presented in column 4. Columns 5 through 7 are the total values of privately negotiated stock repurchases, Dutch auction repurchases and self-tender offer repurchases, respectively, as reported by Securities Data Company (SDC). The total payouts presented in column 8 are the sum of all open market repurchases, dividends, privately negotiated repurchases, Dutch auction repurchases and self-tender offer repurchases. All values are in millions of dollars.

Year	1	2	3	4	5	6	7	8
	Open market share repurchases – CRSP measure	CRSP measure of share repurchases – firms listed on Compustat	Compustat repurchases – firms with announced repurchase programs	Aggregate dividends for all firms reported on Compustat	Privately negotiated repurchases	Self-tender offer repurchases	Dutch auction repurchases	Total payouts = columns 3 + 4 + 5 + 6 + 7
1985	5,100	4,839	8,886	67,602	4,146	16,639	1,092	98,365
1986	12,924	12,239	14,485	77,574	5,517	7,933	2,228	107,737
1987	11,120	10,568	28,888	86,543	2,791	5,741	1,494	125,457
1988	38,578	36,320	28,302	103,996	3,624	12,094	7,516	155,532
1989	24,970	24,597	33,539	102,447	3,116	3,322	4,985	147,409
1990	26,281	25,706	25,234	107,718	2,810	6,429	1,931	144,122
1991	9,076	9,005	16,361	107,775	4,007	4,290	739	133,172
1992	10,126	9,940	19,162	107,089	1,676	1,091	1,597	130,615
1993	16,667	16,111	24,635	109,811	2,210	553	604	137,816
1994	20,532	19,704	29,502	117,426	1,065	3,981	951	152,925
1995	35,690	35,132	46,486	142,118	12,951	1,553	1,444	204,552
1996	47,318	44,533	63,321	141,687	9,334	3,576	2,339	220,257
Total	258,382	248,694	338,801	1,271,786	53,247	67,202	26,920	1,757,984

repurchases. At least at the aggregate level, repurchases appear to make up a disproportionately large share of the short-term fluctuations in payouts, while dividends represent a more permanent component.

#### 4. Firm-level analysis of payouts

##### 4.1. Hypothesis development

To complement this aggregate evidence, we now analyze the factors affecting payouts at the firm level. Cross-sectional work on payout policy dates at least to Fama and Babiak (1968), who find strong empirical support for the Lintner model of dividends during the period from 1946 to 1964. This section reexamines the Fama and Babiak results on a more recent sample. In addition, we empirically examine the factors that lead firms to choose between dividends and repurchases, focusing on the flexibility arguments discussed above.

Lintner (1956) argued that managers pay dividends out of long-run, sustainable earnings. A company with stable earnings would thus tend to pay out a higher dividend than an otherwise similar growth firm. His interviews with managers indicated that they like to increase dividends regularly and view cutting dividends as extremely costly. They are therefore reluctant to make a dividend increase that will subsequently have to be reversed.

The Lintner model suggests a number of testable hypotheses regarding dividend behavior. Dividend-paying firms should be larger than non-dividend paying firms, and should have higher and more stable cash flows. Dividend increases should be related to the permanent components of cash flow, but not necessarily to the temporary components of cash flows. Dividend decreases should be relatively rare and occur only when firms have truly bad performance. Subsequent to dividend increases or decreases, the good or bad operating performance should continue.

There are a number of non-mutually exclusive factors that potentially influence firms in their choice between dividends and stock repurchases. Two such factors, taxes and employee stock options, are effectively unobservable to us. Although the tax system treats dividends and repurchases the same at the corporate level, stock repurchases are generally tax-advantaged at the personal level. The magnitude of this tax advantage depends on the cost bases and marginal tax rates of the shareholders, which are not generally public information. However, it seems unlikely that taxes explain the more recent increase in repurchase activity, since the tax advantage of repurchases was substantially reduced in 1986, approximately corresponding to the beginning of the current repurchase wave.

Fenn and Liang (1997), Jolls (1998), and Weisbenner (1998) stress the importance of employee stock options in the decision to repurchase stock rather than

increase dividends. Employee stock options could influence payout decisions for two reasons. First, employee options create incentives for stock repurchases rather than dividends because the value of an option declines when a stock goes ex-dividend but not when a company repurchases shares. Second, Weisbenner (1998) emphasizes that managers prefer to use repurchased rather than newly-issued shares for employee options to avoid diluting earnings per share. However, directly controlling for the impact of executive options in our empirical work is infeasible given our sample size, since data on executive stock options are not available in machine-readable form. Nonetheless, the combination of these two option-induced reasons is undoubtedly an important factor in the current repurchase trend.

Perhaps the most commonly discussed motive for repurchases concerns asymmetric information. Dann (1981), Vermaelen (1981), and Ikenberry et al. (1995) suggest that stock prices rise on the announcement of a repurchase program. In addition, Comment and Jarrell (1991) find that the abnormal returns observed around the announcement of a repurchase program are inversely related to recent stock price performance leading up to the repurchase announcement. These results are consistent with the view that asymmetric information is an important motive for stock repurchases.

We, like Guay and Harford (2000), focus on the impact of the cash flow's permanence on the choice between dividends and repurchases. We hypothesize that dividends will be used to pay out cash flows that are likely to be permanent, while stock repurchases will be used for cash flows that are not likely to be able to be sustained indefinitely.<sup>13</sup>

This view leads to a number of testable predictions. First, when there is more uncertainty about future cash flows, we expect the firm to utilize repurchases to a greater extent. Second, since operating cash flows tend to be more permanent than non-operating cash flows, we expect a positive relation between operating income and dividends, while repurchases are more likely to be related to non-operating income. Third, if repurchases are more likely to reflect temporary cash flows, we hypothesize that dividend-increasing firms will have larger subsequent cash flows than repurchasing firms. Finally, if firms repurchase stock based on management's belief that the stock is undervalued, we would expect that firms selecting repurchases would have lower stock returns prior to the payout change.

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<sup>13</sup> An alternative would be a "specially designated dividend", which is commonly thought of as an institution for paying out such cash flows. DeAngelo et al. (2000) document that specially designated dividends historically have been much more "regular" than their name implies, suggesting that firms historically used them to pay out recurring rather than unusual cash flows. In addition, these authors find that most firms replaced their specially designated dividends with regular dividends long before the current repurchase wave, suggesting that the repurchases studied here are not a replacement for such specially designated dividends.

#### 4.2. Variable construction

There are a number of variables that are likely to be related to the decision to pay out cash flows. Using Compustat, we construct proxies of these variables for the periods before and after each potential payout increase. Our primary interest is the determinants and method of cash payouts. Consequently, our analysis focuses on cash flow and its components: operating income, non-operating income, and capital expenditures. In order to reduce noise induced by year-to-year variations in many of the variables, we use three-year averages unless otherwise noted. Average values for years  $-3$  through  $-1$  relative to the payout change are used for variables prior to the payout change; average values for years  $0$  through  $+2$  relative to the payout change are used for the variables subsequent to the payout change. The sample for our cross-sectional analysis is limited to the period from 1985 to 1994 to allow for measurement of subsequent cash flows.

We use the book value of total assets (data item #6) in the year prior to the payout change (year  $-1$ ) as our measure of firm size. Operating income is the average ratio of operating income (data item #13) to total assets. Non-operating income is the average ratio of non-operating income (data item #61) to total assets. The standard deviation of operating income is the standard deviation of the ratio of operating income to total assets measured over the 5-year period from year  $-4$  through  $0$ . Capital expenditures is the average ratio of capital expenditures (data item #128) to total assets. The lagged dividend payout ratio is the prior year's ratio of total dividends (data item #21) to net income available to common shareholders (data item #237). The market-to-book ratio is the average ratio of the market value of equity, given by the year-end price per share (data item #24) multiplied by the number of shares outstanding (data item #25), to the book value of equity (data item #62). The debt ratio is the average ratio of long-term debt (data item #9) to total assets. Institutional ownership is the percentage of shares outstanding owned by institutions in the year prior to the payout change obtained from Compact Disclosure and is only available from 1991 through 1994. The increase in dividends divided by the market value of equity is the ratio of total dividends for the prior year minus total dividends for the current year to the market value of equity. The increase in repurchases divided by the market value of equity is the announced value of the open market repurchase program obtained from SDC to the market value of equity, given by the year end price per share (data item #24) multiplied by the number of shares outstanding (data item #25). Stock returns are computed from CRSP.

#### 4.3. Univariate differences

Table 3 presents univariate statistics on the differences between firms that choose different payout methods. Column 1 provides statistics for the entire

Table 3  
Firm characteristics according to payout method

This table provides means (medians in parentheses) of various firm characteristics for the categories of possible payout combinations. Column 1 consists of all firm-years listed on Standard and Poor's Compustat (Compustat) tapes from 1985 through 1994; utilities and financial firms are excluded in all categories. Column 2 contains firm-years with increased total payouts resulting from either increasing dividends, initiating a repurchase program, or both; the sample in column 2 is the union of the samples in columns 3, 4 and 5. Column 3 contains firm-years with initiations or expansions of repurchase programs. Column 4 contains firm-years with both repurchases and dividend increases. Column 5 contains firm-years with dividend increases. Column 6 contains firm-years with no change in current payout levels; the firms must have positive payouts, but dividends have not changed. Column 7 contains firm-years with no payouts (neither dividends nor stock repurchases) in either the current or prior year. Column 8 contains firm-years with decreases in total payouts; the sample in column 8 is the union of the samples included in columns 9 and 10. Column 9 contains firm-years with no repurchase announcement in the current year, but with a repurchase initiation or expansion in the prior year. Column 10 contains firm-years with dividend decreases; there are 30 firm-years with both dividend decreases and repurchase decreases (as defined for column 9) included in this column. Dividend increases and decreases are defined on a per share basis adjusted for stock splits and include only regular dividends as reported by CRSP.

All statistics are compiled from data obtained from Compustat unless otherwise stated; in order to reduce noise induced by year-to-year variations in many of the variables, we use three-year averages unless otherwise stated. Average values for years  $-3$  through  $-1$  relative to the payout change are used for variables prior to payout change; average values for years  $0$  through  $+2$  relative to the payout change are used for the variables subsequent to the payout change. Firm size is total assets (data item #6) in the year prior to the payout change (year  $-1$ ). Operating income is the average ratio of operating income (data item #13) to total assets. Non-operating income is the average ratio of non-operating income (data item #61) to total assets. The standard deviation of operating income is the standard deviation of the ratio of operating income (data item #13) to total assets measured over the 5-year period from year  $-4$  through  $0$ . Capital expenditures is the average ratio of capital expenditures (data item #128) to total assets. The lagged dividend payout ratio is the prior year's ratio of total dividends (data item #21) to net income available to common shareholders (data item #237). The market-to-book ratio is the average ratio of the market value of equity, given by the year-end price per share (data item #24) multiplied by the number of shares outstanding (data item #25), to the book value of equity (data item #62). The debt ratio is the average ratio of long-term debt (data item #9) to total assets. Institutional ownership is the percentage of shares outstanding owned by institutions in the year prior to the payout change from Compact Disclosure. The prior year market returns are the CRSP monthly returns geometrically cumulated for the year prior (year  $-1$ ) to the year in question; current year market returns are the CRSP monthly returns cumulated for the current year (year 0). The increase in dividends/market value of equity is the ratio of total dividends for the prior year (year  $-1$ ) minus total dividends for the current year (year 0) to the market value of equity. The increase in repurchases/market value of equity is the announced value of the open market repurchase program obtained from SDC to the market value of equity.



Firm characteristics	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Full sample	Firms increasing total payouts	Firms repurchasing shares	Firms repurchasing and increasing dividends	Firms increasing dividends	Firms not changing current payouts	Firms that have made no payouts in prior or current years	Firms decreasing total payouts	Firms decreasing repurchases	Firms decreasing dividends
Observations	54,003	5,873	1,485	723	3,665	3,754	42,023	2,353	1,073	1,280
Prior or payout change:										
Firm size (in millions of dollars)	870.304 (40,265)	1,939,978 (290.1)	983,450 (109.15)	3,568,777 (836.23)	1,999,777 (345.45)	1,671,838 (225.23)	581,398 (20.16)	1,142,695 (146.64)	979,937 (119.29)	1,287,04 (188.10)
Operating income (%)	6.906 (11.93)	21.158 (19.79)	19.128 (16.99)	22.401 (21.035)	21.695 (20.25)	17.140 (15.58)	2.309 (8.70)	15.626 (13.50)	18.248 (16.76)	13.316 (11.51)
Non operating income (%)	2.124 (1.37)	1.725 (1.37)	2.116 (1.71)	1.609 (1.305)	1.616 (1.28)	1.690 (1.25)	2.302 (1.39)	1.955 (1.44)	2.106 (1.575)	1.829 (1.335)
Standard deviation of operating income (%)	12.791 (6.49)	(5.688) (3.69)	10.291 (6.18)	4.025 (2.93)	4.319 (3.34)	5.693 (4.33)	15.429 (8.06)	8.892 (5.74)	10.204 (5.835)	7.747 (5.59)
Capital expenditures (%)	11.359 (6.55)	9.497 (7.465)	11.219 (7.53)	8.627 (7.485)	9.003 (7.44)	8.955 (7.13)	12.109 (6.18)	9.984 (6.64)	10.615 (7.13)	9.259 (6.30)
Lagged dividend payout ratio (%)	12.172 (0.0)	32.079 (24.41)	15.75 (0.0)	39.585 (30.98)	37.309 (29.025)	46.279 (28.82)	4.985 (0.0)	31.482 (8.905)	17.98 (0.0)	43.528 (23.36)
Market-to-book ratio	2.247 (1.69)	2.297 (1.9)	2.272 (1.778)	2.548 (2.149)	2.257 (1.905)	1.685 (1.430)	2.364 (1.738)	1.764 (1.38)	2.045 (1.613)	1.505 (1.189)
Debt ratio (%)	24.633 (18.382)	18.247 (16.115)	20.431 (16.93)	16.472 (15.27)	17.753 (16.1)	20.376 (18.035)	25.187 (18.74)	22.751 (20.47)	20.796 (17.59)	24.436 (22.27)

Table 3 (continued)

Firm characteristics	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Firms increasing total payouts	Firms repurchasing shares	Firms repurchasing and increasing dividends	Firms increasing dividends	Firms not changing current payouts	Firms that have made no payouts in prior or current years	Firms decreasing total payouts	Firms decreasing repurchases	Firms decreasing dividends
Institutional ownership (%)	25.027 (18.875)	42.566 (44.06)	35.486 (33.885)	50.338 (53.49)	44.859 (47.08)	40.792 (40.61)	17.416 (9.51)	32.788 (31.62)	35.449 (34.54)	28.811 (26.55)
Prior year stock returns	0.128 (0.010)	0.185 (0.149)	-0.011 (-0.080)	0.158 (0.111)	0.259 (0.207)	0.118 (0.076)	0.120 (-0.032)	0.084 (0.010)	0.222 (0.135)	-0.064 (-0.114)
Increase in dividends/ market value of equity (%)	0.00 (0.0)	0.575 (0.399)	0.003 (0.0)	0.719 (0.470)	0.764 (0.525)	0.101 (0.061)	0.04 (0.0)	-2.275 (-0.380)	-0.010 (0.0)	-4.296 (-2.383)
Increase in repurchases/ market value of equity (%)	—	—	7.972 (5.704)	6.397 (4.953)	—	—	—	—	-6.746 (-5.647)	—
Subsequent to payout change:										
Operating income (post) (%)	4.082 (10.03)	18.985 (18.276)	14.752 (13.993)	20.914 (19.804)	20.139 (19.337)	14.249 (13.257)	0.747 (7.865)	10.037 (9.382)	13.082 (12.918)	7.484 (7.451)
Non-operating income (post) (%)	1.716 (0.977)	1.272 (0.907)	1.536 (1.110)	1.074 (8.368)	1.205 (0.853)	1.172 (0.783)	1.858 (1.027)	1.154 (7.87)	1.359 (0.985)	0.983 (0.642)
Capital expenditures (post) (%)	10.879 (5.455)	9.491 (7.397)	9.690 (6.371)	8.694 (7.362)	9.569 (7.814)	8.313 (6.273)	11.601 (4.994)	7.026 (4.492)	8.494 (5.786)	5.791 (3.476)
Current year stock returns	0.064 (0.0)	0.211 (0.166)	0.107 (0.040)	0.252 (0.212)	0.242 (0.196)	0.095 (0.051)	0.033 (-0.068)	-0.069 (-0.133)	-0.080 (-0.147)	-0.056 (-0.116)

sample, which consists of all firm-years on Compustat from 1985 through 1994 excluding utilities and financial firms. Column 2 presents the means and medians for firm-years with increased total payouts. Columns 3, 4 and 5 break down the payout-increasing firm-years: Column 3 includes observations with initiations or expansions of repurchase programs, Column 4 contains cases with dividend increases in addition to an initiation or expansion of a repurchase program, and Column 5 includes the firm-years with dividend increases but no new repurchase program.<sup>14</sup> Column 6 presents the means and medians for firm-years with positive payouts that remain constant from the previous year, while Column 7 includes observations for firm-years with no payouts (neither dividends nor stock repurchases) in either the current or prior year. Column 8 presents the means and medians for firm-years with decreases in total payouts. Columns 9, and 10 break down these payout-decreasing observations: Column 9 contains observations with no repurchase announcement in the current year, but with a repurchase initiation or expansion in the prior year, while Column 10 presents the means and medians for firm-years with dividend decreases. The 30 firm-years in which both dividends and repurchases decrease are included with the dividend decreases in Column 10.

#### 4.3.1. *Dividend changes*

Table 3 allows us to examine the empirical predictions of the Lintner model discussed above. The results are consistent with the predictions of this model. Firms making payouts are substantially larger than firms that have not made payouts in the current or prior year. Dividend-increasing firms have higher operating incomes and similar non-operating incomes than firms that do not change payouts. Given that operating cash flows are relatively permanent while non-operating incomes are more temporary, this finding suggests that dividend increases are funded out of permanent cash flows. The standard deviation of operating income, a proxy for the stability of cash flows, is lower for the dividend-increasing firms than for the firms making no change to existing (but positive) payouts. The standard deviation of operating income for the firms keeping current payouts constant is lower than the standard deviation of operating income for firms that have not historically made any payouts. Subsequent to the payout change, dividend-increasing firms continue to have substantially higher operating income than firms that do not change payouts, which is in turn higher than subsequent operating income for firms that have not historically paid dividends. These differences are significant at the 1% level using two-tailed test of means and a Wilcoxon nonparametric test. All these results are consistent with the predictions of the Lintner model discussed above.

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<sup>14</sup> Dividend increases and decreases are defined on a per share basis adjusted for stock splits and include only regular dividends as reported by CRSP.

Finally, the Lintner view suggests that firms will avoid dividend decreases if at all possible, so that dividend decreases will be less frequent than increases and associated with genuinely poor performance. The data in Table 3 are consistent with this view. There were 1,280 cases in which the nominal dividend per share decreases; in comparison, there are 4,388 cases of dividend increases (723 of these observations also repurchase stock in the same year). However, the dividend decreases were much larger than the increases (4.3% of equity value compared to 0.76% of equity value). In these cases, the firms are indeed in financial difficulty. During the year prior to dividend decreases, the average firm paid out 43.53% of net income as dividends. The average operating income to assets was substantially lower for these firms than for firms keeping payouts constant or increasing them. Subsequent to the payout decrease, the average operating income over assets for these firms decreases to 7.48%, just over a third of the average for dividend-increasing firms.

#### 4.3.2. *The choice between stock repurchases and dividends*

Table 3 also documents systematic differences between the dividend-increasing and repurchasing firms. Dividend-increasing firms are generally larger than repurchasing firms. Prior to the payout increase, dividend-increasing firms have higher operating cash flows. However, consistent with the financial flexibility hypothesis, non-operating cash flows are higher for repurchasing-increasing firms than for dividend-increasing firms. The standard deviation of the operating income for the repurchasing firms is about twice as high as for the dividend-increasing firms, suggesting that cash flows for repurchasing firms are substantially more uncertain than they are for dividend-increasing firms.

Perhaps the most striking number in Table 3 is the dividend payout ratio prior to the decision. The average dividend payout ratio for firms that increased both dividends and repurchases is 39.6% and is 37.3% for firms that increase only dividends. In comparison, the average lagged dividend payout for repurchasing firms is only 15.8% and the median is zero.<sup>15</sup> In fact, the median firm increasing repurchases previously did not pay out any dividends at all. This large difference suggests that dividend-increasing firms are following a historical policy of paying out cash flows, while repurchases are less frequent events allowing firms to pay out a cash surpluses that are likely to be temporary.

Subsequent to the payout increase, operating income is substantially and statistically significantly higher for the dividend-increasing firms than for the repurchase increasing firms. Non-operating income continues to be higher for

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<sup>15</sup> This difference is potentially due to taxes: If low-tax investors purchase stocks of dividend-paying companies and high-tax investors purchase stocks of repurchasing companies, then stockholders of dividend-paying firms will prefer firms to increase dividends and stockholders of non-dividend paying firms prefer to increase repurchases. Many thanks to a referee for suggesting this possibility.

repurchasing firms than for either of the other payout-increasing types, with both differences statistically significant at the 1% level. These results are consistent with the view that repurchases are used to pay out temporary cash flows while dividends are used to pay out permanent ones.

Another difference between repurchases and dividends concerns the size of the payouts. Firms increasing repurchases announce programs with announced targets equal to about 8% of equity value. Given that they typically buy about 75% of this target over the subsequent two or three years (see Stephens and Weisbach, 1998), this value implies an increase in annual payouts of about 2% to 3% of equity value. In contrast, dividend increases are much more common but average only 0.76% of equity value. Repurchases allow firms to distribute large quantities of cash to shareholders relatively quickly. Thus, the quantity of cash a firm wants to distribute is likely to be an important factor in choosing between dividends and repurchases.

One of the common explanations of stock repurchases is that they occur when managers believe their stock is undervalued (see Dann, 1981; Vermaelen, 1981). Consistent with this view is evidence that firms tend to announce programs following poor stock market performance (see Comment and Jarrell, 1991; Stephens and Weisbach, 1998). This result holds in our sample as well; the average stock return for firms that announce repurchase programs but do not increase dividends during the year prior to the announcement is  $-1.1\%$  and the median is  $-0.8\%$ . In contrast, the average return for firms announcing dividend increases but not a repurchase program is  $25.9\%$  and the median is  $20.7\%$ . This large difference is statistically significant at the 1% level.

Table 3 also presents the mean and median level of institutional ownership for each category. These observations are consistent with the view that institutions prefer established companies that have performed well recently. Firms that are increasing payouts have substantially higher institutional ownership than firms keeping payouts constant or decreasing them. Among the payout-increasing firms, the ones increasing repurchases but not dividends have the lowest levels of institutional ownership. One explanation of this finding is that many institutions are tax-exempt, so that they do not share in the tax benefits of repurchases. Given this interpretation, this result is consistent with the arguments of Allen et al. (1998), who suggest that one motive of dividend payments is to attract institutional investors that will subsequently provide monitoring benefits to the firm.

Overall, the univariate comparisons in Table 3 suggest that dividend-increasing and repurchasing firms are noticeably different. Repurchasing firms have more uncertain cash flows and have not historically had high payout ratios. They have lower operating incomes but higher non-operating incomes. Firms tend to increase repurchases following poor stock-market performance while they tend to increase dividends following good performance. Finally, institutions tend to favor dividend-paying over repurchasing firms.

#### 4.4. Multivariate differences

The univariate comparisons suggest that there are differences between firms' payouts depending on the firms' characteristics. Since, these characteristics are correlated with one another we examine these differences in a multivariate context.

To do so, we estimate a model in which firm characteristics predict payout policy. One complicating factor is that there are many potential choices of payout methods, roughly corresponding to the columns of Table 3. Given that these choices do not have a clear ordering, a natural approach to this problem is a multinomial logit model.<sup>16</sup>

The multinomial logit model assumes that the probability of an outcome  $Y$  is given by:

$$\text{Prob}(Y = j) = \frac{e^{\beta_j x_i}}{1 + \sum_{k=1}^J e^{\beta_k x_i}} \quad \text{for } j = 1, 2, \dots, J, \quad (1)$$

and

$$\text{Prob}(Y = 0) = \frac{1}{1 + \sum_{k=1}^J e^{\beta_k x_i}}. \quad (2)$$

Each  $\beta_j$  is a vector of dimension equal to the number of independent variables, which can be estimated by maximum likelihood. These estimates are conveniently expressed in terms of the log odds of any two outcomes, which equal:

$$\ln \left[ \frac{P_{ij}}{P_{ik}} \right] = x_i'(\beta_j - \beta_k). \quad (3)$$

The coefficient on each independent variable in this equation equals the difference between the  $\beta$ s for two different outcomes. The  $p$ -value on such a coefficient provides a test of the hypothesis that the independent variable affects the probability of each outcome in the same manner.

Tables 4 and 5 provide estimates of a multinomial logit models predicting payout method choices. The difference between the two tables is that Table 5 includes institutional ownership as an independent variable, which limits the number of observations since our institutional ownership data is not available from Compact Disclosure before 1991. Each model reported here groups payout choices into four categories: increasing only repurchases, increasing only dividends, increasing both repurchases and dividends, or not increasing payouts. We limit the categories because we are primarily interested in the choice between dividends and repurchases. Adding more outcome types complicates

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<sup>16</sup> Weisbenner (1998) uses multinomial logit similarly to estimate the impact of stock option programs on the choice between repurchases and dividends.

both the estimation and the reporting of our results, since each additional choice requires one extra parameter per choice per independent variable. To ensure that limiting the model in this fashion does not affect the inferences we draw from our results, we have also estimated similar models allowing for payout decreases to be a separate choice and models allowing for repurchase decreases and dividend decreases to be separate choices. The results reported below are robust to these specifications.

The coefficients reported in Tables 4 and 5 are estimates of the log-odds between each pair of categories. The multivariate results tell a similar story to the univariate results. The category of firms that do not increase payouts are smaller and have worse operating income both before and after the potential payout increase than any of the payout-increasing categories. Higher standard deviations of operating income also predict a higher probability of not paying out cash. Within the categories of firms that do increase payouts, higher operating incomes increase the probability of a dividend increase, while higher standard deviations of operating incomes increase the probability of repurchases. One univariate result that does not hold here concerns non-operating income prior to the potential payout, which, in a multivariate context, is not significantly related to the choice between dividends and repurchases. However, the non-operating income subsequent to the payout change is significantly positively related to the likelihood of repurchases. Finally, dividend-increasing firms and firms that both increase dividends and repurchases have significantly higher market returns than repurchasing firms for both prior and current years.

Finally, the results reported in Table 5 incorporate the impact of institutional ownership, similar to DeAngelo et al. (2000). Institutional ownership is correlated with both the firm's decision to increase payouts and the choice of payout methods. Similar to the univariate results, firms that increase payouts have significantly higher institutional ownership than firms that do not increase payouts. In addition, dividend-increasing firms have higher institutional ownership than repurchasing firms.

Overall, our multivariate analysis is consistent with the univariate comparisons discussed earlier and both generally support the hypothesis that the financial flexibility inherent in open market repurchase programs is an important consideration in the choice of payout methods.

## **5. Conclusions**

In this paper we analyze the recent rise in open market stock repurchases. We start with a complete listing of program announcements supplied by SDC. From these announcements, we construct a database consisting of both an underestimate and an overestimate of actual repurchases for every Compustat firm

Table 4

Operating and stock performance characteristics affecting a firm's choice of payout method

This table presents the results from estimation of a multinomial logit model of various operating characteristics and stock returns thought to predict a firm's choice of alternative methods of distributing cash flows in a given year. Each column provides the parameter estimates obtained from the log-odds ratios. The first column compares firm-years with no increase in payouts to firm-years in which payouts increase through the use of repurchases, increased dividends or both. The second column compares firm-years with repurchase program initiations or expansions to the other possible outcomes. The third column compares firm-years with both stock repurchases and dividend increases to the other alternatives and the fourth column compares firm-years with dividend increases to the other alternatives. All independent variables are the same as defined in Table 3.

	Firm-years with no increase in payouts		Firm-years with repurchase announcements		Firm-years with repurchase announcements and dividend increases		Firm-years with dividend increases	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Firm-years with no increase in payouts								
Intercept			3.329	0.000	4.024	0.000	2.353	0.000
Firm size			-14.021	0.010	-31.172	0.000	-17.918	0.000
Operating income (prior)			-2.971	0.000	-7.359	0.000	-6.836	0.000
Non-operating income (prior)			-3.159	0.013	-2.657	0.324	-1.297	0.376
Payout ratio (prior)			0.028	0.618	-0.126	0.000	-0.121	0.000
Std. deviation operating income			2.567	0.000	30.574	0.000	27.699	0.000
Operating income (post)			-2.619	0.000	-7.052	0.000	-6.192	0.000
Non-operating income (post)			-2.861	0.037	4.331	0.059	2.611	0.066
Prior year stock return			0.593	0.000	0.324	0.007	-0.046	0.039
Current year stock return			-0.054	0.470	-0.588	0.000	0.545	0.000
Firm-years with repurchase announcements								
Intercept	-3.329	0.000			0.694	0.000	-0.976	0.000
Firm size	14.021	0.010			-17.150	0.003	-3.896	0.481
Operating income (prior)	2.971	0.000			-4.389	0.000	-3.864	0.000
Non-operating income (prior)	3.159	0.013			0.502	0.863	1.861	0.317



Payout ratio (prior)	-0.028	0.618	-0.154	0.015	-0.149	0.313
Std. deviation operating income	-2.567	0.000	28.008	0.000	25.133	0.000
Operating income (post)	2.619	0.000	-4.431	0.000	-3.571	0.000
Non-operating income (post)	2.861	0.037	7.192	0.005	5.472	0.003
Prior year stock return	-0.593	0.000	-0.267	0.064	-0.638	0.000
Current year stock return	0.054	0.470	-0.534	0.000	-0.491	0.000
Firm-years with repurchase announcements and dividend increases						
Intercept	-4.024	0.000	-0.694	0.000	-1.670	0.000
Firm size	31.172	0.000	17.150	0.003	13.254	0.001
Operating income (prior)	7.359	0.000	4.389	0.000	0.523	0.417
Non-operating income (prior)	2.657	0.324	-0.502	0.863	1.359	0.631
Payout ratio (prior)	0.126	0.000	0.154	0.015	0.043	0.657
Std. deviation operating income	-30.574	0.000	-28.008	0.000	-2.874	0.110
Operating income (post)	7.052	0.000	4.431	0.000	0.860	0.203
Non-operating income (post)	-4.331	0.059	-7.192	0.005	-1.721	0.484
Prior year stock return	-0.324	0.007	0.267	0.064	-0.370	0.002
Current year stock return	0.588	0.000	0.534	0.000	0.042	0.667
Firm-years with dividend increases						
Intercept	-2.553	0.000	0.976	0.000	1.670	0.000
Firm size	17.918	0.000	3.896	0.481	-13.254	0.001
Operating income (prior)	6.836	0.000	3.864	0.000	-0.523	0.417
Non-operating income (prior)	1.297	0.376	-1.861	0.317	-1.359	0.631
Payout ratio (prior)	0.121	0.000	0.149	0.013	-0.043	0.657
Std. deviation operating income	-27.699	0.000	-25.133	0.000	2.874	0.110
Operating income (post)	6.192	0.000	3.571	0.000	-0.860	0.203
Non-operating income (post)	-2.611	0.066	-5.472	0.003	1.721	0.484
Prior year stock return	0.046	0.039	0.638	0.000	0.370	0.002
Current year stock return	0.545	0.000	0.491	0.000	-0.042	0.667
Observations	16,047					
Log-likelihood	-9,157					

Table 5

Operating and stock performance characteristics affecting a firm's choice of payout method

This table presents the results from estimation of a multinomial logit model of various operating characteristics and stock returns thought to predict a firm's choice of alternative methods of distributing cash flows in a given year. Each column provides the parameter estimates obtained from the log-odds ratios. The first column compares firm-years with no increase in payouts to firm-years in which payouts increase through the use of repurchases, increased dividends or both. The second column compares firm-years with repurchase program initiations or expansions to the other possible outcomes. The third column compares firm-years with both stock repurchases and dividend increases to the other alternatives and the fourth column compares firm-years with dividend increases to the other alternatives. All independent variables are the same as defined in Table 3.

	Firm-years with no increase in payouts		Firm-years with repurchase announcements		Firm-years with repurchase announcements and dividend increases		Firm-years with dividend increases	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Firm-years with no increase in payouts								
Intercept			3.642	0.000	5.326	0.000	3.389	0.000
Firm size			16.689	0.311	-16.708	0.015	-15.768	0.000
Operating income (prior)			-2.011	0.000	-6.915	0.000	-6.599	0.000
Non-operating income (prior)			-2.842	0.238	-1.391	0.817	6.203	0.059
Payout ratio (prior)			0.179	0.108	-0.052	0.909	-0.008	0.719
Std. deviation operating income			1.109	0.065	27.457	0.000	25.423	0.000
Operating income (post)			-2.495	0.000	-5.288	0.000	-4.906	0.000
Non-operating income (post)			-5.594	0.007	-2.243	0.756	-5.319	0.121
Institutional ownership			-0.021	0.000	-0.036	0.000	-0.026	0.000
Prior year stock return			0.697	0.000	0.581	0.011	0.024	0.706
Current year stock return			-0.185	0.104	-0.889	0.000	-0.627	0.000
Firm-years with repurchase announcements								
Intercept			-3.642	0.000	1.684	0.000	-0.253	0.217
Firm size			-16.689	0.311	-33.397	0.056	-32.457	0.052
Operating income (prior)			2.011	0.000	-4.904	0.000	-4.588	0.000
Non-operating income (prior)			2.842	0.238	1.451	0.819	9.045	0.021
Payout ratio (prior)			-0.179	0.108	-0.185	0.123	-0.189	0.097

Std. deviation operating income	-1.109	0.065	26.347	0.000	24.314	0.000
Operating income (post)	2.495	0.000	-2.793	0.063	-2.411	0.010
Non-operating income (post)	5.594	0.007	3.351	0.652	0.274	0.943
Institutional ownership	0.021	0.000	-0.016	0.002	-0.005	0.121
Prior year stock return	-0.697	0.000	-0.179	0.441	-0.722	0.000
Current year stock return	0.185	0.104	-0.704	0.001	-0.441	0.004
Firm-years with repurchase announcements and dividend increases						
Intercept	-5.326	0.000		0.000	-1.937	0.000
Firm size	16.708	0.015		0.056	0.940	0.891
Operating income (prior)	6.915	0.000		0.000	0.316	0.816
Non-operating income (prior)	1.391	0.817		0.819	7.594	0.238
Payout ratio (prior)	0.052	0.909		0.123	-0.004	0.940
Std. deviation operating income	-27.457	0.000		0.000	-2.033	0.539
Operating income (post)	5.288	0.000		0.063	0.381	0.789
Non-operating income (post)	2.243	0.756		0.652	-3.076	0.684
Institutional ownership	0.036	0.000		0.002	0.011	0.022
Prior year stock return	-0.518	0.011		0.441	-0.542	0.009
Current year stock return	0.889	0.000		0.001	0.262	0.208
Firm-years with dividend increases						
Intercept	-3.389	0.000		0.217	1.937	0.000
Firm size	15.768	0.000		0.052	-0.940	0.891
Operating income (prior)	6.599	0.000		0.000	-0.316	0.816
Non-operating income (prior)	-6.203	0.059		0.021	-7.594	0.238
Payout ratio (prior)	0.008	0.719		0.097	0.004	0.940
Std. deviation operating income	-25.423	0.000		0.000	2.033	0.539
Operating income (post)	4.906	0.000		0.010	-0.381	0.789
Non-operating income (post)	5.319	0.121		0.943	3.076	0.684
Institutional ownership	0.026	0.000		0.121	-0.011	0.022
Prior year stock return	0.024	0.706		0.000	0.542	0.009
Current year stock return	0.627	0.000		0.004	-0.262	0.208
Observations		5,124				
Log-likelihood		-2,851				

between 1985 and 1996. The data indicate that repurchases have grown over this period. In 1996, actual repurchases amounted to between \$44.3 and \$63.3 billion, suggesting that they are an economically important source of payouts. However, repurchases are still considerably smaller than the \$141.7 billion in dividends paid that year.

Repurchases are noticeably more volatile than dividends. They appear to vary procyclically, they were high during the rising markets of the late 1980s, dropped in the recession of the early 1990s and increased during the boom of the mid-1990s. Repurchases are responsible for a disproportionately large fraction of the variation in total payouts. The smoothness of the dividend series combined with the volatility and procyclicality of the repurchase series are consistent with the view that dividends are paid out of sustainable cash flows while repurchases are paid out of temporary cash flows. Repurchases do not appear to be replacing dividends; rather they seem to serve the complementary role of paying out short-term cash flows.

A cross-sectional analysis of firms' decisions to increase dividends or repurchases is consistent with this view. Firms with higher operating cash flows are more likely to increase dividends, while firms with higher non-operating cash flows are more likely to increase repurchases. Firms with a higher standard deviation of cash flows are more likely to use repurchases. Subsequent to the payout increase, cash flows of repurchasing firms continue to be lower than those of dividend-increasing firms.

Textbook discussion of payout policy generally suggests that dividends and stock repurchases are more or less equivalent ways of paying out cash flows (see Brealey and Myers, 1996 or Grinblatt and Titman, 1988). Generally, the discussion of the choice between the two revolves around Black's (1976) focus on repurchases' tax advantage relative to dividends. Our empirical work suggests that much more than taxes are necessary to explain differences in how dividends and repurchases are used in practice. Dividends and repurchases are used at different places in the business cycle by different types of firms. Our interpretation of these results emphasizes the financial flexibility inherent in repurchases. While this is likely to be part of the explanation, the complete answer is undoubtedly more involved. For example, the striking difference in stock market performance prior to dividend increases and repurchase programs suggests that valuation is also an important factor in determining payout methods.

Even though repurchases have not replaced dividends, they have become an important source of payouts. Many branches of finance research have focused on dividends, and their yields in many different contexts. For example, much research has examined the extent to which expected returns can be predicted using dividend yields (see Campbell and Shiller, 1988; Fama and French, 1988; Kandel and Stambaugh, 1996; Kothari and Shanken, 1997; or Pontiff and Schall, 1998). Another related literature has focused on excess volatility and the

issue of whether the variation in stock prices can be explained by movements in dividends (see Shiller, 1981; Leroy and Porter, 1981; Marsh and Merton, 1986; Kothari and Shanken, 1992). These two strands of the literature could be extended productively by considering total payouts rather than only dividends in their econometric work.

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