To pay or not to pay?
The dividend dilemma of the liquid firm*

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Abstract

In the presence of trading frictions investors in need of sustained income might have preference for dividend paying stocks. However, this preference should decline as trading frictions in the market decline. We hypothesize that improved market liquidity is negatively related to the proportion of firms paying dividends. Our evidence suggests that periods of fewer dividend payers, and, lower dividend initiation rates are also characterized by lower trading costs and increased market activity. The results of this paper relate directly to the findings of Fama and French (2001). They document that firms have a declining propensity to pay dividends. We show that the lower propensity of firms to pay dividends is largely explained by improved market liquidity. Also, the ability of improved market liquidity to explain the proportion of dividend payers is higher for large financially liquid firms. These are the firms with higher ability to pay dividends. Our results do not seem to be driven by changes in tax-induced preferences, share repurchase activity, firm conversion policies, and the managerial compensation.

1. Introduction

In a recent article Fama and French (2001) document a significant decline of dividend paying firms. In the population of NYSE, AMEX, and Nasdaq firms, the proportion of dividend paying firms declines from 66.5% in 1978 to 20.8% in 1999. Changing firm characteristics of newly listed firms, such as size, profitability, and, growth opportunities account for roughly half of the decline. The unexplained part is termed "lower propensity to pay dividends". Such lower propensity to pay is evident mainly for newly listed firms that have never paid a dividend and that exhibit decreasing dividend initiation rates.

Miller and Modigliani (1961) formally develop the dividend irrelevance hypothesis. If capital markets are perfect, firm value is shown to be solely a function of the investment opportunities of the firm and should be independent of the payout policy. Investor clienteles in need of current income can create homemade dividends by selling an appropriate amount of their holdings in the firm. In the case of a market without transaction costs for buying and selling shares investors will be indifferent between receiving a dollar of dividend and selling a dollar worth of their investment.

With the existence of imperfect capital markets, however, investors need not be indifferent as to the liquidation method of their investment. For example, if investors are subject to taxes, differential tax rates of different investor classes will give rise to distinct dividend preferences among investors and possibly to differential tax clienteles.[1] Changes in overall market liquidity will also have an impact on the benefits of dividend paying stocks as opposed to non-paying firms. Improved liquidity, in general, should reduce the benefits of dividend versus realized capital gains. Thus, investors' demand for dividend paying stocks will decrease. (See Appendix A)

In this paper we further develop the framework of Fama and French (2001) to evaluate the effect of improved market liquidity on the firm's propensity to pay

[1] See, for example, Allen, Bernardo, and Welch (2000)

dividends. We first argue that the qualities of the US stock markets have changed dramatically in the past 40 years. Lower commission rates, lower spreads, and a significant increase in market activity are a few of the more noticeable changes. Also, we document that the lower propensity of firms to pay dividends, documented by Fama and French (2001), is more pronounced for large, financially liquid firms and also firms that are actively traded on the market and have lower bid-ask spreads.

We employ the logistic regression approach to relate firm's propensity to pay dividend to its stock market trading activities. We document that firms with more active markets are less likely to pay a dividend. When we apply our estimates to predict the proportion of future dividend payers, we document that increased market activity explains most of the lower propensity of firms to pay dividend. The improved predictive ability of the model, which includes market liquidity as opposed to a model based only on firm's financial ability, is even more pronounced for portfolios of large firms and firms with low bid-ask spreads and high market activity.

Further investigation shows that improved market liquidity explains the decline of dividend payers for a portfolio of stocks with an investor clientele that is more likely to be indifferent between dividends and capital gains from a tax point of view.[2] Such results, we argue, indicate that the liquidity effect goes beyond any possible impact that changes in the tax environment may have on the proportion of dividend payers.

Share repurchase programs consume cash in the hands of the firm and so the implementation of such programs can affect other payout avenues, like cash dividends. The declining propensity of firms to pay dividends might be a result of higher reliance on share repurchases as a payout mechanism. Additionally, share repurchases increase market activity so that, all else equal, firms that repurchase shares in lieu of paying a

[2] The distinction between dividends and capital gains is less significant for financial institutions, many of which are exempt of all taxes. Also, corporations have tax related reason to prefer dividends over capital gains. Effective tax rate on dividends received by large corporations is 10.5%; whereas they have to pay a 35% on full amount of realized capital gains.

dividend, will have more active stock markets.[3] In order to evaluate the effect of market liquidity on the propensity of the firm to pay dividends, independent of share repurchases, we apply our model to a portfolio of firms that did not repurchase stock in the examined year. We still find that market activity is an important factor in explaining the reduced proportion of dividend payers. For the firms that did repurchase in the examined year we consider market activity net of repurchase activity. We are able to show that market activity net of repurchases is a significant factor in explaining the reduced proportion of dividend payers.

Our next robustness check includes a control for a possible change in the use of convertible securities in the financial structure of the firm and also the compensation structure of managers. We show that these firm characteristics are a significant determinant in the firm's decision to pay a dividend. Increase in the usage of incentive based compensation instruments, like stock options, have implications for the payout policy of the firm. Dividends tend to reduce the value of options and so management might have a conflict of interest when deciding to issue cash dividends. Even after controlling for theses effects, however, we show that stocks with more liquid markets are less likely to pay dividends. After controlling for improved market liquidity and changes in the firms' number of shares reserved for conversion we find that the predicted and the actual proportion of dividend payers have not diverged in a significant manner over time.

Finally, we show that share liquidity is a significant factor in explaining the dividend initiation policies of firms.

The rest of the paper we organize as follows. Section 2 examines the changes in the qualities of security markets for the period of 1963-2001. Section 3 describes the sample and the variables. Section 4 presents the results while the section 5 concludes.

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[3] Particularly, this is the case if firms undertake open market share repurchases. Jagannathan, Stephens, and Weisbach (2000) document that open market share repurchases constituted approximately 52% in 1985 and approximately 95% in 1995 of total share repurchases.

2. Changes in market liquidity from 1963 to 2001

The following discussion aims at a brief outline of the significant changes in the characteristics of the US security markets that have taken place from 1963 to 2001. We elaborate on several aspects of market liquidity and yet our discussion is far from comprehensive. The two broad issues under interest are: (i) changes in regulations and the resulting changes in the competitive environment in the industry and (ii) changes in several measures of overall trading costs and market activity.

2.1. Regulatory changes and their impact on the competitive environment

The principle of self-regulation, provided by the Securities Exchange Act of 1934, largely allowed the NYSE to manage itself.[4] Prior to 1975 the cartel on NYSE was characterized by fixed commission rates, limited entry, and rules that prohibited price-cutting and that limited brokerage services per seat. Competition from other exchanges in the trading of NYSE listed stocks was reduced through additional means.[5]

The Maloney Act of 1938 explicitly prohibited the NASD from imposing fixed minimum rates of commission in the OTC market. However, in the 1960's and 70's, it was a violation of the NASD's rules for an NASD member to provide a customer with an actual quote.[6] Information barriers and price schedules in general make it harder for

[4] Commission rates were increased on regular bases with the acceptance of SEC. Even though direct rulemaking authority was given to the SEC in certain cases, the power of SEC to request changes was not used until December 5, 1968. In 1968 SEC pressures forced NYSE to adopt a volume discount on transactions over 1,000 shares. In 1971 commissions on the excess of any order over $500,000 were determined "as mutually agreed" (See Stoll, 1979; Stoll, 1985; Huang and Stoll 1996).

[5] Until 1976, the rules of AMEX prohibited trading in NYSE issues. During the summer of 1976, the NYSE and AMEX, under pressure from the SEC, changed their rules to permit dual trading in issues listed on the other exchange. Such a development however did not necessarily lead to improved competition, as most members of AMEX were members of NYSE (See Stoll, 1979; Stoll, 1985; Huang and Stoll 1996).

[6] Instead, member firms were only allowed to divulge a representative quote of the approximate market price. Professionals, however, could readily obtain the actual market quotes (See Stoll, 1979; Stoll, 1985; Huang and Stoll 1996).

investors to access critical market information, thus decreasing the liquidity of the market.

Proponents of the fixed commission rates argued that increased price competition would force NYSE members to leave the exchange so that a few large firms would eventually dominate the market. The resulting market fragmentation will reduce the overall liquidity of the market. The opponents of the fixed commission schedule, on the other hand, argued that competition would lead to lower prices and higher level of trading activity. In the long run, competition will result in higher incentives to reduce costs and will ultimately increase the efficiency of the market.

On the basis of extensive hearings and studies conducted between 1968 and 1975, the SEC and committees of the House and the Senate reached the conclusion that the evidence did not support the argument for fixed commission rates. The Securities Acts Amendments of 1975 and Rule 19b-3 became effective in May 1, 1975. The amendments mandated a national market system for securities in which competitive forces will play a much more significant role. Fixed rates of commissions were abolished.

The deregulation of the industry marked the emergence and expansion of discount brokers that offered lower commission rates to customers who already knew which securities they wish to buy or sell.[7] Apart from lower commission rates, immediate execution and execution reports were major dimensions in advertising the services of such brokers.[8] Discount brokers covered approximately 3.4% of the retail business in 1976 while by 1984 the share of discount brokers has increased to 23%.[9]

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[7] The deep discount brokers represent the extreme in discount brokerage. Such brokers offer no frills, such as analyst reports, but as a result their commissions are significantly reduced.

[8] Other strategies aimed at client ease of access to the services of the broker. Charles Schwab, for example, has steadily increased the number of its domestic branch offices from seven in 1977 to 415 by the end of 2000. (See for example http://www.schwab.com/ and Bianco, 1986)

[9] See Schares (1985).

2.2. Trading costs and market activity

Stoll (1979) reports that by the first quarter of 1976 the SEC estimated that commissions of institutional firms were 31.6% below what they would have been under fixed commissions.[10] Jones (2002) estimates average commission rates of around 0.80% in the 1960-1980 period. His estimates show that average commissions have steadily declined to 0.10% by 2000. A more comprehensive analysis of commission expenses is obstructed by the lack of information for earlier periods encompassing a sufficient number of brokers. However, in Appendix B we present an example.

Jones (2002) also examines the bid-ask spreads of the stocks in the DJIA and documents that "spreads have fallen dramatically over the last twenty years".[11] From his evidence it appears that the average proportionate quoted bid-ask spread in the 1960-1980 was approximately 0.60% while by the end of the 1990's it had steadily decreased to around 0.20%. In dollar amounts, the average bid-ask spread has declined from around 35 cents per share in 1963 to around 12 cents per share in 2000.[12]

Combining commissions and bid-ask spread costs Jones (2002) documents that total one-way costs have decreased from around 1.30% in the 1960-1980 period to around 0.20% in 2000.[13]

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[10] Commissions have declined more on transactions of institutional investors and hardly at all on transactions of individuals. The SEC study that Stoll (1979) cites, however, does not include discount brokers.

[11] As argued by Jones and Lipson (2001) and Stoll (1979), spreads alone need not be a sufficient statistic of market liquidity.

[12] For a significantly shorter time period, Huang and Stoll (1996) examine a sample of 343 S&P500 stocks listed on NYSE between 1987-1991. In their conclusion they write: "Our overall evidence indicates that the NYSE's executions quality has improved over the period 1987 to 1991. However, the improvement on the competing regional exchanges and the NASD is even more dramatic, resulting in the smaller execution cost differentials between the NYSE and its competitors."

[13] Other trading costs included federal and state transfer taxes. For a transaction of 500 shares at $20/share the 1960-1980 federal plus state transfer taxes would have been an average of $30 for a stock with no par value. In October 1, 1981 transfer taxes were eliminated. In other words, transfer taxes in this example have declined from an average of 0.30% to 0.00% (See Jones, 2002, earlier version).

The above outlined changes in the competitive environment of security markets and the direct costs of trading were combined with an increase in trading activity for the period of 1963-2000. Average annual share turnover has increased from approximately 25% in 1963 to around 175% in 2000. In the median company investors exchanged approximately 17% of the shares outstanding in 1964. This number for 2000 was around 114%.

3. Sample and variable definitions

We obtain data from the Center for Research in Security Prices (CRSP) monthly files, the Compustat annual files, the Trade and Quote (TAQ) database, and the CDA/Spectrum database of Thomson Financial. The sample consists of all firms with publicly traded common stock that have available data as discussed below. We exclude firms with CRSP Standard Industrial Classification (SIC) codes between 6000-6999 (financials) and between 4900-4949 (utilities).

A firm is defined as a dividend payer in year *t* whenever Compustat reports positive dividend per share (data item #26) for the fiscal year ending in calendar year *t*. We document similar results if we use CRSP data to identify dividend-paying firms.

Throughout our analysis we use a measure to proxy for the size of the firm in year *t* that we construct as follows. We first divide the market capitalization of firm *i* for year *t* by the median NYSE market capitalization for the same year. Then we take natural logarithm of the resulting ratio. The market capitalization for year *t* is equal to the product of share price and number of shares outstanding for June of year *t* as reported in the CRSP monthly files. We construct this measure of the size of the firm under the assumption that the median NYSE market capitalization has the same implications for the dividend policy of the firm throughout the examined period of 1963-2001.[14]

[14] We obtain similar results when we use the size measure devised by Fama and French (2001). For year *t* and for every firm their measure is equal to the percentage of NYSE firms with lower market capitalization.

Our proxies for firm growth opportunities and profitability are the ones used by Fama and French (2001). To proxy for growth opportunities we use the value-to-assets ratio of the firm for year *t* (V_t/A_t) and the proportionate change in assets for year *t* (dA_t/A_t). Firm profitability for year *t* we measure by its earnings divided by its assets for that year (E_t/A_t). The assets and the earnings for each firm we obtain from the Compustat annual files. We use data for the fiscal year ending in year *t*. The value (V_t) of the firm we calculate as assets minus book value of equity plus market value of equity.[15]

We use the Compustat annual files to obtain the number of shares outstanding, the number of shares traded for calendar year *t*. Firm trading liquidity we measure as the ratio of number of shares traded to number of shares outstanding.[16]

A second proxy of liquidity that we use is also a measure of the market activity in a firm. It is equal to the natural logarithm of 0.01 plus the number of shares traded (data item #28) times the closing price for year *t* (data item #24). This measure has also been used in existing literature.

We also employ the quoted relative bid-ask spread for June of year *t* as our last proxy for liquidity. The quoted relative bid-ask spread has been used extensively in the market microstructure literature as a proxy for liquidity. The data is obtained from the TAQ database, which provides data on exchange-listed stocks for the period 1993-2001. Consistent with previous research, we include only quotes that occurred between 9:30 a.m. and 4:00 p.m. We also include only days for which a firm has more than five quotes. For each quote on the TAQ database we calculate the quoted relative spread as: $Spread = 2(Ask - Bid)/(Ask + Bid)$, where *Ask* and *Bid* are the ask and the bid quotes respectively. We average this measure for each day, and we annualize it by multiplying

[15] For a more detailed discussion of the computation of these variables see Fama and French (2001).

[16] We obtained similar results when we used CRSP data. However, CRSP has trading volume for Nasdaq stocks only after 1982. For that reason we report the results using Compustat data.

by 252. Then we average these daily averages over all trading days of June for year *t* in order to estimate our measure of the proportionate quoted spread.[17]

Our choice of share turnover as a main proxy for liquidity is driven by several factors. Amihud and Mendelson (1986) develop a model where assets with shorter holding periods, thus with higher turnover rates, have lower spreads. Stoll (2000) argues that a measure of trading activity plays an important role in explaining the cross-sectional variation in spreads both in historic and current data. Apart from being a proxy for the bid-ask spread, share turnover also proxies for the execution risk of an investor where firms with higher share turnover have lower execution risk. Share turnover has been used in other research as a liquidity proxy.[18] We additionally argue that share turnover has a relatively constant meaning over time, a desirable characteristic given the nature of our analysis.

We use the CDA/Spectrum database to calculate the proportion of institutional ownership by institution type for June of year *t*. When a firm has no data available in the CDA/Spectrum database we set institutional ownership equal to zero for all institutional types since no institution has an f13 filing for that firm. As a result, using the database does not lead to data availability constraints. There are five institutional types as defined by CDA/Spectrum. The first type includes banks. The second type consists of Insurance companies. Mutual funds comprise the third type. Investment advisors fall into the fourth group while university endowments and pension funds constitute the remaining fifth group.[19]

Share repurchases we measure as the total expenditure on the purchase of common and preferred stock (Compustat data item #115) minus any reduction in the value

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[17] Researchers have argued that effective, rather than quoted spreads, are a better measure of trading costs and that quoted spreads and effective spreads usually differ. Indeed, Stoll (2000) documents that quoted spreads are larger than effective spreads but he also documents a cross-sectional correlation of 0.9921 between quoted and effective spreads for NYSE/AMEX. For Nasdaq this correlation is 0.9946.

[18] See for example Chordia, Subrahmanyam, and Anshuman (2001), Brennan, Chordia, and Subrahmanyam (1998), and Datar, Naik, and Radcliffe (1998).

[19] June rather than December data for spreads and institutional ownership possibly avoids any effects that end-of-the-year tax-loss selling might have on these variables.

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

We also construct a dummy variable to proxy for the existence of convertible securities and stock options (Compustat data item #40). Additionally we used a measure of whether a firm has outstanding stock options by a dummy indicating whether there are shares reserved for the exercise of stock options (Compustat data item #215). The second variable is less available than total shares reserved for conversion, and when using it we obtain similar results. For those reasons here we report only the results with total shares reserved for conversion. The variable is available up to 1995 for the whole sample as Compustat stopped reporting it after August 22, 1996. Therefore, when we use shares reserved for conversion in our analysis results are reported up to 1995.

4. Evidence in support of the hypothesis

In this section we present evidence, which we argue supports the main hypothesis of the paper. First, we analyze the relation between a firm's characteristics and its propensity to pay dividend. We then estimate the effect of share turnover on the probability of dividend. We also argue that the liquidity effect is independent from the tax effect in the sense that improved liquidity results in lower proportion of dividend payers even for a sample of firms with investor clientele indifferent to dividend from a tax perspective. Further robustness checks include controls for share repurchases and possible incentives of firms to pay fewer dividends due to changes in their financing and compensation policies.

4.1. Market activity and the proportion of dividend payers - graphical interpretation

Figure 1 indicates that in periods of increasing market activity the proportion of dividend paying stocks declines.

[Insert Figure 1 About Here]

Furthermore, average market activity and dividend initiation rates appear to be negatively related. In periods of high market activity firms initiate dividend payments with lower rates than in periods of low market activity. The proportion of share repurchases for those firms appears to be stable over time up until 1996 so share repurchases do not appear to fully explain the lower propensity of firms to pay.

[Insert Figure 2 About Here]

For a sample of dividend payers, however, the proportion of share repurchasing firms increases over the 1971-2001 period. Such an increase in share repurchase activity is accompanied by an increased market activity.

[Insert Figure 3 About Here]

These initial results are consistent with the notion that improved market liquidity, rather than alternative payout policies, explain the lower dividend initiation rates of non-payers.

4.2. Financial liquidity, stock market liquidity, and firm propensity to pay dividends

We first estimate the probability of a firm to pay dividend as a function of the four firm characteristics discussed by Fama and French (2001). As explanatory variables we use measures of firm size, firm profitability, and firm growth opportunities. The results from the logistic regression are presented in Table 3 and are consistent with the findings of Fama and French (2001). Larger and more profitable firms are more inclined to pay dividends while firms with higher growth opportunities are less likely to do so.

The base model estimated by Fama and French (2001) appears to have the worst predictive ability of the proportion of dividend payers for the portfolios of firms with low market-to-book ratios, i.e. firms with fewer growth opportunities and higher ability to pay dividends. However, when we use the change in assets as a proxy for growth opportunities we observe that the model performs the worst for the portfolio of firms with the highest change in assets. Thus, we cannot conclude whether the model fails for firms with high or with low growth opportunities since the results point in opposite directions.

Next we examine the predictive ability of the model across different size and then profitability portfolios. The model explains relatively well the proportion of dividend payers for the portfolio of small firms and firms with low earnings, regardless of the growth proxy being used. Additionally, for the least profitable portfolio, the highest difference between the percent of predicted and actual payers is for large firms. It appears that prediction errors are largest for firms that are of medium-size and that have high profitability. For the 1998-2001 period, for example, the difference between predicted and actual payers for the portfolio of small firms with high market-to-book and high profitability is 3.05 percentage points. When we examine the portfolio of medium-sized firms with low market-to-book and high earnings, the prediction error jumps dramatically to 64.78 percentage points.

Our results are consistent with the hypothesis, also advanced by Fama and French (2001), that the lower propensity to pay dividend is mostly pronounced in firms that are more able to pay, i.e. larger firms and firms with higher earnings power.

[Insert Table 2 About Here]

We hypothesize that increased market liquidity is the major reason for firms able to pay dividends to decide not to do so. We next examine the proportion of dividend payers and the predictive ability of the model across three portfolios based on share turnover. Examining Panel A of Table 3 we observe that firms with lower share turnover are more likely to pay dividends. We then note that the base model results in the highest predictive error for the portfolio of high turnover stocks.

Finally, we divide our 1993-2001 sample into three portfolios based on the 33rd and 67th percentile of the proportionate quoted bid-ask spread for 1993. Panel B of Table 2 shows that the base model usually results in the highest prediction error when applied to the portfolio of firms with low proportionate quoted spread. In 2000, for example the difference between predicted and actual percent is 26.9 percentage points for the low-spread portfolio, 19.63 percentage points for the medium-spread portfolio, and 11.06 percentage points for the high-spread portfolio. We also note that firms with lower

proportionate spread are more likely to pay dividend than firms with high proportionate spread in earlier periods while this relation appears to revert in 2000 and 2001.

The proportion of dividend payers declines steadily for the portfolio of firms with low bid-ask spreads. Interestingly, the proportion of dividend payers for the portfolio of firms with high bid-ask spreads has increased over the 1993-2001 period. This trend is in contrast with the overall evidence of declining propensity of firms to pay dividends.

We summarize the above discussion by concluding that a model based on the firm's ability to pay dividends fails to predict future dividend payers. More importantly for our discussion, the model is less accurate when applied to larger, more profitable firms, and also firms with high share turnover and low proportionate quoted spreads. These preliminary results are consistent with the main hypothesis of the paper that improved market liquidity has resulted in profitable firms deciding to not pay dividends.

4.3. The predictive ability of improved market liquidity

Next we examine the relation between the market liquidity of a firm and its probability to pay a dividend while controlling for firm financial capability of paying a dividend. Our overall results suggest that more liquid firms, i.e. firms with higher share turnover, higher traded dollar volume, and lower relative bid-ask spreads, are less likely to pay dividend. These relationships persist throughout the whole sample period.

[Insert Table 3 About Here]

Even though market liquidity appears to be related to the firm's decision to pay a dividend, we need to examine whether adding a measure of market liquidity improves the overall predictive ability over the base model of Fama and French (2001). When we analyze the predictive ability of the two models we show that the model that includes share turnover significantly decreases the difference between predicted payers and actual payers estimated from the original model. In 2000, for example, the difference between predicted and actual payers is 21.04 percentage points using the original model. This difference declines to 6.63 percentage points when share turnover is included as a predictive variable.

[Insert Table 4 About Here]

We now examine the impact of adding a measure of market activity on the predictive ability of the model over several portfolios based on different firm characteristics. Table 7 shows that the improved predictive ability of the model is most noticeable for the portfolio of large firms. In the period of 1998-2001, for example, the difference between predicted and actual payers for the portfolio of large firms with low profitability and low market to-book ratio is 26.86 percentage points using the original model. This difference declines to 2.5 percentage points when share turnover is included as a predictive variable. Analyzing the impact of the inclusion of share turnover across the three profitability portfolios it appears that on average the new model improves the predictive ability across the different profitability portfolios. Similar results are evident when the model is applied to different growth portfolios.

[Insert Table 5 About Here]

And finally, Panel A and Panel B of Table 6 document that the new model has improved predictive ability mostly for the portfolio of firms with high share turnover and the portfolio of firms with low proportionate quoted bid-ask spreads.

[Insert Table 6 About Here]

To summarize, a model that includes a measure of firm share liquidity has better predictive ability in estimating the percent of dividend payers over a model that does not include such a measure. The improvement is more notable for large firms and firms with more liquid market for their shares.[20]

4.4. Prediction for firms that paid and firms that did not pay a dividend in year t-*1*

Further robustness checks include separate analysis for firms that paid a dividend in year *t*-1 and for firms that did not. Table 7 reports the average estimated coefficients for the two sub-samples. Share turnover appears to be a significant determinant in the firms

[20] When we use the portfolio approach of Fama and French (2001) we obtain similar pattern in the overall predictive ability of the two models under consideration. The difference between predicted and actual payers, however, is larger than it is when using the logistic predictive model.

decision to pay a dividend in year *t*, regardless of whether the firm paid a dividend in *t*-1 or not.

[Insert Table 7 About Here]

When we apply the estimated coefficients to the portfolio of past dividend payers we obtain similar results as in Fama and French (2001). Dividend payers appear to continue paying a dividend with a rate predicted by both models. In the sample of firms that did not pay a dividend in year *t*-1, the model that includes share turnover predicts better the dividend initiation rate than the model that does not. We deem this as evidence that one of the important reasons for the declining propensity of firms to pay dividends is the improved market liquidity over time.

[Insert Table 8 About Here]

5. Robustness checks

5.1. Taxes and clientele effects

Firms with high ownership of pension funds and university endowments appear to be more likely to pay a dividend than companies with low ownership of such institutions. Furthermore, the decline in the proportion of dividend payers in the portfolio with more tax-advantaged institutions is less dramatic than the decline in dividend payers for a portfolio of firms with low ownership of such institutions. The base model has better predictive ability for the sample of firms with low ownership of tax-advantaged clientele as compared to a sample of firms with high ownership of tax-advantaged clientele. Including share turnover improves the predictive ability of the model for both portfolios of firms but the improvement is even more noticeable for the portfolio with high ownership of tax-advantaged institutions. That result for the portfolio of firms with high ownership of investors with tax advantage for dividend income is consistent with the hypothesis that increased market liquidity, apart from

changes in the tax code, plays an important role in explaining the lower propensity of firms to pay dividends.

[Insert Table 9 About Here]

We next create two portfolios based on ownership of tax-advantaged institutions, where the first portfolio consists of firms with more than 3% mutual fund ownership and at most 1% ownership of insurance companies, pension funds, and university endowments. The second portfolio consists of all firms with less than 3% ownership of mutual funds and more than 5% ownership of insurance companies, pension funds, and university endowments. We again observe that a model taking into account market activity predicts better the future proportion of dividend payers for both portfolios, results consistent with our previous discussion.

[Insert Table 10 About Here]

5.2. Share repurchases

We next show that increased market activity improves the predictive ability of the model for a portfolio of firms that do not repurchase shares in year *t*. We allocate firms into two portfolios based on whether the firm has positive amount of common shares repurchased in year *t* or not. The decline in dividend payers for the portfolio of firms that did not repurchase is more dramatic than for the portfolio of firms that did. This result is consistent with Fama and French (2001), who argue that share repurchases are performed by firms that are also likely to pay dividends, so that the declining propensity to pay is not driven solely by increasing share repurchase activity. For a sample of firms that do not repurchase shares in year *t* there still appears to be a declining propensity to pay a dividend. We now note that improved market liquidity results in better predictive ability for both the portfolio of firms with no share repurchases and for the portfolio of firms with share repurchases. These results, we argue, support our hypothesis that the effect of market liquidity on firm propensity to pay a dividend is important and is not entirely driven by the increasing use of share repurchase programs.

[Insert Table 11 About Here]

Further robustness checks include a second measure of share turnover, which we construct as follows. From number of traded shares for each firm in year *t* we subtract an estimate of the number of share repurchased for the same year. Since Compustat reports repurchase amounts in dollar terms, repurchased shares is equal to repurchased dollar amount divided by price per share at the end of year *t*. Also, Compustat has repurchase data from 1971 so our base estimation period becomes 1971-1977.

Table 12 shows that adding this new measure of market activity still improves the predictive ability of the base model so the main conclusions of the previous sections remain unchanged.

[Insert Table 12 About Here]

5.3. Stock options and convertible securities

We also attempt to control for possible changes in the amount of stock options and convertible securities issued by the firm. For that reason we construct a dummy variable that indicates whether the firm has issued convertible securities and stock options to managers. We then include this variable as one of our explanatory variables when predicting the probability of the firm to pay a dividend. It appears that firms with positive number of shares reserved for conversion are less likely to pay dividends than firms with no such shares. Nevertheless, the coefficient in front of share turnover is still positive and significant and of similar magnitude.

[Insert Table 13 About Here]

When we add the conversion dummy to our model its predictive ability is improved. However, a model that includes trading activity still performs better than a model that does not. Interestingly, a model that includes both share turnover and the conversion dummy seems to perform surprisingly well when explaining the future proportion of dividend payers. The sample, however, is truncated at 1995 so that these results seem inconclusive. In 1993, for example, the predictive error is -0.09 percentage points while in 1995 it is 2.98 percentage points.

[Insert Table 14 About Here]

6. Conclusion

We hypothesize that, all else equal, when trading costs decline investors in need of current income are less sensitive to whether income is received through cash dividends distributed by the firm or through the sale of a part of investor holdings.

The decreasing propensity of firms to pay dividend is significantly related to the notable changes in the qualities of US security markets. A period of fewer dividend payers is also characterized by lower trading costs and increased market activity.

The evidence supports our hypothesis. Part of the lower propensity of firms to pay appears to be explained by increased trading activity. We present evidence that our results are not driven by changes in tax-induced preferences, changes in share repurchase policies, or changes in the conversion policy and the managerial compensation structure of the firm.

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Appendix A

Similar to Miller and Modigliani (1961) there is no uncertainty and the project that the firm will undertake has a rate of return of $r^* > 0$. Investors are subject to income tax on dividend payments of t_D, capital gains tax of t_G, and transaction costs of t_C. The model consists of two periods and the investor's required rate of return is r. In the first period firms select payout policy in order to maximize the value of the firm in that period. In the second period firms implement their policy and liquidate. The firms can choose between two policies. The first policy requires the firm to pay the return as a dividend while the second policy does not. If the firm pays a dividend its value in the first period will be:

$$V_{A,1} = \frac{I_1(1-t_D)r^* + L_{A,2}}{1+r}$$

I_1 is the investment of the firm in period 1 while $L_{i,2}$ is the liquidation value of firm i in the second period. If the firm decides to not pay a dividend then investors will have to realize the gain through trading and the firm value in the first period will be:

$$V_{B,1} = \frac{I_1(1-t_G)(1-t_C)r^* + L_{B,2}}{1+r}$$

Since both firms are assumed to liquidate identically it must be the case that $L_{A,2} = L_{B,2}$.

A firm with a given clientele will pay dividend as long as:

$$\frac{I_1(1-t_D)r^* + L_{A,2}}{1+r} > \frac{I_1(1-t_G)(1-t_C)r^* + L_{B,2}}{1+r}$$

$$(1-t_D) > (1-t_G)(1-t_C)$$

$$\frac{(t_D - t_G)}{(1-t_G)} < t_C$$

Assume that tax rates of the relevant investor clienteles are randomly distributed across firms. As a result the left-hand side of the inequality will be a random variable independent of t_c. Let $F(\cdot)$ represent the cumulative density function of this variable. Then the expected amount of dividend payers in a population of firms will be equal to:

$$DIV(t_c) = F(t_c)$$

The proportion of dividend payers is clearly increasing in t_c.

Appendix B

If an investor wanted to trade 500 shares of a $20/share stock in 1963 he would have paid a commission of $135, or approximately 1.35%. The commission for the same trade in 1975, before deregulation, would have been $226. As a comparison, $135 in 1963 would have increased to $243 if inflated by the Consumer Price Index (CPI). Stoll (1979) also documents that changes in commission schedules prior to May 1, 1975, closely followed the CPI. In 1979 the commission for the trade with a full service broker would have been an average of $210, while with a discount broker it would have been $116. As a comparison, the CPI would have raised the 1963 commission of $135 to around $336. By 1995 the CPI would have raised the commission to around $673. However, full service brokers were charging on average $237, while discount brokers were charging $65. By 2000 the expansion of the Internet has resulted in even lower trading commissions ranging from $9.99 per trade for Datek to around $30 for Merrill Lynch Direct, Morgan Stanley, and Charles Schwab.[21]

[21] Commissions prior to 1975 are calculated using the NYSE fixed commission schedule published in the NYSE fact book. Commissions for 1979 are obtained from Financial World, November 1979. Commissions for 1995 are obtained from Fortune, December 25, 1995. 2000 commissions were obtained from Forbes, 2000. Commissions for 2000 were obtained from each broker's web-seite.

Table 1
Predicted minus actual percent of dividend payers for 27 portfolios based on firm size, profitability, and growth opportunities using average logistic regression estimates for 1963-1977

For each year between 1963-1977 we estimate a logistic regression to explain whether a firm pays dividend in year *t*. As explanatory variables we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), and the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t). We next create 27 portfolios based on NYM_t, E_t/A_t, and V_t/A_t or dA_t/A_t. Portfolios are created using the average 33rd and 67th percentiles of the examined variables for the 1963-1977 period. The table reports the predicted percent of dividend payers minus the actual percent of dividend payers for each portfolio. The predicted percent of payers for each portfolio in a given year *t* is equal to the average predicted probability of dividend for that portfolio. We estimate the individual firm's probability to pay a dividend by using the average coefficients from 1963-1977 and the values of the explanatory variables for the firm for year *t* in the logistic model.

	Investment Variable is V_t/A_t									Investment Variable is dA_t/A_t								
	Low E_t/A_t			Medium E_t/A_t			High E_t/A_t			Low E_t/A_t			Medium E_t/A_t			High E_t/A_t		
	Low	V_t/A_t	High	Low	V_t/A_t	High	Low	V_t/A_t	High	Low	dA_t/A_t	High	Low	dA_t/A_t	High	Low	dA_t/A_t	High
					Small firms									Small firms				
1963-77	– 7.68	7.79	5.46	– 14.23	5.93	9.33	2.55	2.29	11.59	0.41	– 5.24	– 2.71	2.40	– 10.45	– 2.95	9.83	– 9.02	8.79
1978-82	– 11.80	– 0.63	3.83	– 14.06	6.19	12.64	– 0.08	9.61	20.65	– 5.05	– 13.80	– 5.27	– 5.32	– 12.71	– 4.65	8.76	– 0.01	12.74
1983-87	– 2.97	3.42	2.43	– 1.08	7.12	11.76	22.76	20.82	23.42	– 0.53	1.27	3.40	3.97	– 4.38	11.94	24.19	11.68	26.26
1988-92	1.24	5.93	3.06	15.77	15.87	13.86	29.68	32.55	27.73	1.87	3.83	5.45	15.83	11.83	17.36	33.75	21.29	30.58
1993-97	5.19	7.51	3.95	13.20	19.45	17.44	35.45	35.78	28.86	3.75	8.05	6.77	15.03	16.27	19.44	35.13	23.32	32.44
1998-01	6.02	7.41	3.05	24.94	24.11	22.91	43.08	35.91	32.33	4.08	9.94	6.16	20.94	25.23	26.25	33.78	29.89	39.77
					Medium-sized firms									Medium-sized firms				
1963-77	– 2.74	10.42	16.67	– 9.42	1.71	13.05	– 1.54	3.75	3.15	3.28	2.72	3.38	– 3.60	– 8.77	3.07	0.55	– 7.06	5.41
1978-82	– 12.10	3.92	6.71	– 13.13	– 1.88	20.28	– 4.23	2.48	12.97	– 5.00	– 10.67	0.44	– 7.25	– 10.01	0.40	4.17	– 4.69	11.00
1983-87	0.10	2.60	11.72	4.20	3.61	18.85	16.14	15.41	21.70	0.71	5.01	10.47	0.32	2.66	18.44	15.13	5.43	26.50
1988-92	6.97	7.85	10.50	17.26	15.07	25.34	29.61	25.86	29.28	4.44	12.73	12.78	12.14	7.00	29.88	18.43	22.72	35.86
1993-97	15.43	14.99	11.33	27.03	21.63	27.59	67.11	37.05	33.70	8.18	12.46	17.01	14.88	22.97	31.33	27.48	26.25	39.15
1998-01	23.94	17.79	12.89	45.47	30.36	35.37	64.78	39.93	39.84	12.80	20.91	19.00	30.88	27.68	42.13	34.09	34.75	47.53
					Big firms									Big firms				
1963-77	1.88	5.91	4.53	– 2.08	– 0.31	1.61	– 1.96	0.42	– 3.94	8.52	– 0.04	6.43	– 1.74	– 2.22	4.93	– 2.80	– 4.92	– 3.33
1978-82	– 1.03	5.50	13.19	– 1.55	1.08	3.06	– 1.75	0.79	7.83	– 1.89	1.11	4.89	– 1.88	– 1.52	3.68	– 0.71	– 1.00	8.20
1983-87	2.91	3.05	8.48	1.28	3.56	13.31	– 0.08	2.62	7.64	– 1.00	5.62	15.25	2.06	– 0.27	13.73	2.36	0.38	12.03
1988-92	7.33	2.73	12.25	7.32	6.99	10.70	19.38	17.78	9.48	3.16	4.93	13.34	2.57	6.96	19.18	8.05	2.42	19.59
1993-97	16.23	17.21	16.57	20.38	17.17	19.86	50.47	30.35	21.72	8.27	15.69	26.42	8.57	15.48	31.49	9.12	9.61	36.94
1998-01	26.86	23.86	24.91	42.68	26.64	27.19	42.20	42.16	28.07	19.41	30.37	28.48	18.22	31.94	33.84	21.15	20.44	39.29

Table 2
Actual and predicted percent of dividend payers for three portfolios based on share turnover (Panel A) and bid-ask spread (Panel B) using average logistic regression estimates from the period of 1963-1977

For each year between 1963-1977 we estimate a logistic regression to explain whether a firm pays dividend in year *t*. As explanatory variables we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), and the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t). We next create three portfolios based on share turnover ($TURN_t$), Panel A, and proportionate bid-ask spread (PS_t), Panel B. Portfolios are created using the average 33rd and 67th percentiles for the 1963-1977 period for share turnover. When we create portfolios using the proportionate spread we use the 33rd and 67th percentiles for 1993, as spread data is not available prior to 1993. Firms is the number of firms in a portfolio for a given year. Actual Percent is the percent of payers in a given portfolio. The Predicted Percent of payers for each portfolio in a given year *t* is equal to the average predicted probability of dividend for that portfolio. We estimate the individual firm's probability to pay a dividend by using the average coefficients from 1963-1977 and the values of the explanatory variables for the firm for year *t* in the logistic model.

Panel A

	Low				$TURN_t$				High			
Year	Firms	Actual Percent	Predicted Percent	Predicted – Actual	Firms	Actual Percent	Predicted Percent	Predicted – Actual	Firms	Actual Percent	Predicted Percent	Predicted – Actual
1978	616	72.24	59.82	– 12.42	953	75.97	68.25	– 7.72	1,168	64.64	70.18	5.54
1979	733	65.76	55.44	– 10.32	992	73.69	66.10	– 7.59	1,195	59.08	66.38	7.30
1980	556	64.21	51.77	– 12.44	849	74.44	63.28	– 11.16	1,496	56.48	63.15	6.67
1981	633	61.45	50.84	– 10.61	911	66.63	61.96	– 4.67	1,479	48.34	60.39	12.05
1982	635	49.45	43.94	– 5.51	943	54.19	52.56	– 1.63	1,554	50.00	60.90	10.90
1983	371	48.52	39.49	– 9.03	702	52.71	47.67	– 5.04	2,165	43.56	52.04	8.49
1984	653	39.36	37.76	– 1.60	970	42.89	46.76	3.87	1,812	41.28	56.46	15.18
1985	496	33.06	31.20	– 1.87	816	41.67	41.37	– 0.29	2,067	40.88	53.10	12.22
1986	440	25.45	24.92	– 0.53	667	37.18	35.35	– 1.83	2,343	37.99	49.96	11.97
1987	421	29.93	25.80	– 4.13	653	30.78	33.58	2.80	2,602	33.32	47.54	14.22
1988	687	27.80	29.10	1.29	934	31.16	37.32	6.16	1,960	34.64	52.56	17.91
1989	556	28.78	29.07	0.29	757	31.97	35.46	3.49	2,140	34.39	50.11	15.72
1990	663	26.85	30.37	3.52	799	34.79	40.10	5.31	1,930	34.87	53.61	18.74
1991	613	27.08	28.27	1.19	661	35.25	39.30	4.05	2,129	33.07	48.46	15.39
1992	483	31.68	30.92	– 0.75	617	41.17	41.76	0.60	2,485	28.13	45.45	17.32
1993	342	37.13	33.55	– 3.59	568	43.13	40.92	– 2.21	2,894	25.57	43.08	17.51
1994	371	36.12	35.67	– 0.45	628	38.69	42.66	3.96	3,160	23.92	44.57	20.64
1995	308	36.36	37.24	0.88	576	41.84	44.72	2.88	3,341	23.38	43.63	20.25
1996	249	37.75	35.68	– 2.07	522	37.55	44.49	6.94	3,749	22.11	42.07	19.95
1997	224	33.48	35.42	1.94	506	35.38	40.32	4.95	3,786	21.50	41.41	19.91
1998	198	36.87	41.30	4.44	485	31.96	41.29	9.33	3,688	21.45	42.98	21.53
1999	144	32.64	41.76	9.12	441	34.69	43.22	8.52	3,458	21.69	42.71	21.02
2000	161	29.81	42.13	12.32	368	33.15	42.15	9.00	3,366	20.47	43.24	22.77
2001	297	23.57	29.08	5.51	476	26.47	29.97	3.49	2,662	21.79	43.47	21.68

Panel B

	Low				PS_t				High			
Year	Firms	Actual Percent	Predicted Percent	Predicted – Actual	Firms	Actual Percent	Predicted Percent	Predicted – Actual	Firms	Actual Percent	Predicted Percent	Predicted – Actual
1993	1,026	61.21	74.09	12.89	1,058	26.18	43.68	17.50	1,025	7.80	20.47	12.66
1994	1,123	59.13	77.10	17.97	1,133	22.15	44.80	22.65	1,154	7.80	20.57	12.77
1995	1,489	48.22	69.52	21.30	1,137	20.49	39.16	18.67	986	7.00	19.25	12.25
1996	1,879	40.61	63.41	22.81	1,292	15.17	32.77	17.60	935	8.98	19.17	10.18
1997	1,917	40.58	64.08	23.49	1,239	13.72	31.87	18.15	1,071	7.66	16.08	8.42
1998	2,357	34.03	59.28	25.25	1,079	13.53	29.82	16.29	900	7.56	15.97	8.42
1999	2,155	33.27	57.06	23.79	1,029	14.67	33.19	18.52	847	9.09	18.19	9.10
2000	1,937	27.21	54.11	26.90	963	20.56	40.19	19.63	985	13.50	24.56	11.06
2001	1,624	16.56	41.41	24.84	664	20.63	31.33	10.70	1,137	32.54	44.28	11.74

Table 3
Estimates from a logistic regression to predict dividend payers

The sample consists of all firms with available data from CRSP and Compustat. For each year *t* of the 1963-2001 period we estimate a logistic regression. The dependent variable is 1.0 in year *t* if a firm pays dividends and 0.0 otherwise. As explanatory variables we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t), and several proxies for the stock market liquidity of the firm. Liquidity is proxied by the share turnover for year *t* ($TURN_t$), the natural logarithm of 0.01 plus the dollar volume for year *t* in millions ($DVOL_t$), and the natural logarithm of the average proportionate bid-ask spread for June of year *t* (PS_t). When the liquidity measure is the bid-ask spread we include the natural logarithm of the share price for June of year *t* as a control variable and its coefficient is significant and positive. The table reports the average estimated coefficient for a given period and the *t*-statistic of whether the average estimate is significantly different from zero.

Dependent variable is the probability of the firm to pay dividend in year *t*

	1963-1977			1978-1992			1993-2001			
Intercept	1.87	2.38	3.87	2.14	3.03	4.72	0.69	1.62	5.03	– 0.36
	(12.52)	(14.85)	(14.14)	(12.56)	(16.69)	(42.30)	(4.61)	(15.42)	(16.96)	(– 0.85)
NYM_t	0.79	0.80	1.39	0.81	0.95	1.46	0.65	0.77	1.49	0.42
	(42.27)	(23.27)	(50.21)	(83.35)	(64.03)	(66.07)	(21.33)	(35.02)	(23.84)	(10.57)
V_t/A_t	– 0.77	– 0.68	– 0.69	– 0.87	– 0.74	– 0.77	– 0.60	– 0.43	– 0.45	– 0.58
	(– 8.42)	(– 8.32)	(– 7.86)	(– 13.04)	(– 11.65)	(– 12.55)	(– 15.07)	(– 21.47)	(– 16.35)	(– 14.61)
dA_t/A_t	– 1.09	– 0.64	– 0.53	– 0.93	– 0.66	– 0.69	– 1.46	– 1.11	– 1.13	– 1.82
	(– 3.93)	(– 2.53)	(– 2.36)	(– 8.18)	(– 7.05)	(– 7.58)	(– 6.41)	(– 5.22)	(– 5.15)	(– 7.31)
$ETOA_t$	14.68	14.32	14.47	6.70	6.49	6.96	6.36	5.50	6.09	5.21
	(11.16)	(12.07)	(12.27)	(17.54)	(16.09)	(16.11)	(27.73)	(22.54)	(21.57)	(14.50)
$TURN_t$		– 1.63			– 1.35			– 1.04		
		(– 9.27)			(– 16.94)			(– 23.49)		
$DVOL_t$			– 0.62			– 0.53			– 0.72	
			(– 11.09)			(– 31.37)			(– 19.48)	
PS_t										0.51
										(3.78)

Table 4
Actual and predicted percent of dividend payers using average logistic regression estimates from the training period of 1963-1977

For each year between 1963-1977 we estimate a logistic regression to explain whether a firm pays dividend in year *t*. As explanatory variables in the first model we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), and the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t). In the second model we add share turnover ($TURN_t$) as an explanatory variable. Firms is the number of firms for a given year. Actual Percent is the percent of payers in a given portfolio. The Predicted Percent of payers for each portfolio in a given year *t* we estimate by using the average coefficients from 1963-1977 and the values of the explanatory variables for each firm for year *t* in the logistic model.

			(1)		(2)	
Year	Firms	Actual Percent	Predicted Percent	Predicted – Actual	Predicted Percent	Predicted – Actual
1978	2,737	70.30	67.18	– 3.12	65.13	– 5.17
1979	2,920	65.72	63.54	– 2.18	62.22	– 3.50
1980	2,901	63.22	61.01	– 2.21	57.33	– 5.89
1981	3,023	56.60	58.87	2.27	57.45	0.85
1982	3,132	51.15	54.95	3.80	52.60	1.45
1983	3,238	46.11	49.66	3.55	44.26	– 1.85
1984	3,435	41.37	50.17	8.80	48.31	6.95
1985	3,379	39.92	47.05	7.13	41.99	2.07
1986	3,450	36.23	43.94	7.71	36.71	0.48
1987	3,676	32.48	42.57	10.09	34.70	2.21
1988	3,581	32.42	44.08	11.66	39.80	7.38
1989	3,453	32.96	43.51	10.55	37.09	4.13
1990	3,392	33.28	45.89	12.60	39.93	6.64
1991	3,403	32.41	43.04	10.63	35.54	3.13
1992	3,585	30.85	42.86	12.01	34.20	3.35
1993	3,804	29.23	41.90	12.67	31.62	2.39
1994	4,159	27.24	43.49	16.24	34.01	6.77
1995	4,225	26.84	43.31	16.47	31.98	5.14
1996	4,520	24.76	41.99	17.24	29.87	5.11
1997	4,516	23.65	40.99	17.34	28.94	5.29
1998	4,371	23.31	42.72	19.40	30.04	6.73
1999	4,043	23.50	42.73	19.23	30.59	7.10
2000	3,895	22.05	43.09	21.04	28.68	6.63
2001	3,435	22.59	40.35	17.76	26.90	4.31

Table 5
Predicted minus actual percent of dividend payers for 27 portfolios based on firm size, profitability, and growth opportunities using average logistic regression estimates from the period of 1963-1977

For each year between 1963-1977 we estimate a logistic regression to explain whether a firm pays dividend in year *t*. As explanatory variables we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t), and the share turnover for year *t* ($TURN_t$). We next create 27 portfolios based on NYM_t, E_t/A_t, and V_t/A_t or dA_t/A_t. Portfolios are created using the average 33rd and 67th percentiles of the examined variables for the 1963-1977 period. The table reports the predicted percent of dividend payers minus the actual percent of dividend payers for each portfolio. The predicted percent of payers for each portfolio in a given year *t* is equal to the average predicted probability of dividend for that portfolio. We estimate the individual firm's probability to pay a dividend by using the average coefficients from 1963-1977 and the values of the explanatory variables for the firm for year *t* in the logistic model.

	Investment Variable is V_t/A_t									Investment Variable is dA_t/A_t								
	Low E_t/A_t			Medium E_t/A_t			High E_t/A_t			Low E_t/A_t			Medium E_t/A_t			High E_t/A_t		
	Low	V_t/A_t	High	Low	V_t/A_t	High	Low	V_t/A_t	High	Low	dA_t/A_t	High	Low	dA_t/A_t	High	Low	dA_t/A_t	High
					Small firms									Small firms				
1963-77	– 5.35	7.12	4.20	– 11.59	4.83	7.00	1.39	1.17	9.85	1.00	– 3.45	– 0.86	2.21	– 10.01	– 2.25	7.88	– 7.93	7.68
1978-82	– 10.23	– 2.16	3.42	– 12.10	2.98	8.29	0.56	5.36	14.59	– 4.92	– 12.63	– 3.96	– 4.90	– 12.24	– 4.57	6.43	– 0.42	8.75
1983-87	– 4.16	1.14	1.55	– 3.26	2.84	7.11	20.34	14.66	16.63	– 2.03	– 0.20	2.21	0.64	– 6.38	6.96	18.74	7.15	19.29
1988-92	0.47	3.91	1.82	14.36	10.40	7.64	27.59	24.26	15.39	0.68	2.45	4.11	12.94	8.65	10.16	27.03	14.25	17.80
1993-97	1.49	2.64	1.60	6.33	10.50	5.27	28.28	23.32	12.44	0.84	3.26	3.07	6.61	8.62	8.10	21.21	12.02	15.90
1998-01	1.25	2.66	1.31	17.54	15.01	11.41	31.18	23.75	17.29	0.38	4.72	2.96	11.95	17.36	16.39	21.51	19.71	24.04
					Medium-sized firms									Medium-sized firms				
1963-77	– 2.90	6.47	13.08	– 8.32	0.83	8.97	0.18	2.36	1.25	1.68	1.22	1.46	– 3.91	– 8.35	0.26	– 0.79	– 6.49	2.84
1978-82	– 15.98	– 5.25	2.08	– 15.56	– 11.17	4.09	– 6.56	– 2.72	4.72	– 10.73	– 14.46	– 5.70	– 11.69	– 13.20	– 9.07	0.28	– 6.89	3.55
1983-87	– 9.09	– 10.05	4.29	– 4.75	– 6.62	4.39	9.58	4.39	10.07	– 8.97	– 6.33	1.19	– 8.79	– 7.62	4.33	4.92	– 1.40	13.39
1988-92	– 5.34	– 3.27	2.80	6.79	2.35	6.62	15.15	13.68	8.90	– 5.25	– 0.92	3.33	2.42	– 4.37	9.66	7.03	10.20	11.92
1993-97	– 1.11	– 1.18	0.99	1.39	5.72	6.40	34.80	21.58	10.64	– 3.05	– 3.47	3.47	2.75	7.15	6.75	15.08	9.51	12.34
1998-01	2.11	1.86	2.90	26.87	13.52	8.97	44.00	18.87	13.47	– 1.85	2.52	6.33	13.86	8.92	16.56	15.70	14.99	17.26
					Big firms									Big firms				
1963-77	2.47	3.59	– 1.33	– 1.55	0.14	2.08	– 1.80	0.40	– 1.94	7.57	– 0.06	3.43	– 1.22	– 1.35	4.89	– 1.50	– 2.96	– 1.55
1978-82	– 5.41	– 4.16	0.57	– 3.07	– 1.25	– 2.45	– 2.05	– 1.09	5.38	– 7.79	– 3.95	– 6.60	– 3.90	– 3.20	– 0.66	– 1.49	– 1.50	5.04
1983-87	– 7.81	– 10.75	– 6.65	– 5.06	– 2.05	1.49	– 4.37	– 1.23	– 0.19	– 12.58	– 7.27	– 2.61	– 2.96	– 6.10	2.87	– 2.57	– 3.68	2.07
1988-92	– 2.96	– 7.26	0.61	0.72	1.48	– 2.18	15.13	6.72	0.08	– 5.94	– 4.89	– 1.07	– 2.49	– 0.78	5.11	3.56	– 1.44	1.44
1993-97	0.80	1.30	– 0.90	16.64	6.79	4.57	14.04	13.17	3.47	– 4.59	1.18	5.44	0.98	2.23	11.82	2.97	– 0.37	7.66
1998-01	2.50	– 1.24	3.11	14.43	6.79	2.73	16.38	19.72	3.02	– 3.28	5.50	4.93	4.15	7.19	4.05	4.56	1.10	7.11

Table 6
Actual and predicted percent of dividend payers for three portfolios based on share turnover and bid-ask spread using average logistic regression estimates from the period of 1963-1977

For each year between 1963-1977 we estimate a logistic regression to explain whether a firm pays dividend in year *t*. As explanatory variables we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t), and the share turnover for year *t* ($TURN_t$). We next create three portfolios based on share turnover ($TURN_t$) and proportionate bid-ask spread (PS_t) - panels A and B respectively. Portfolios are created using the average 33rd and 67th percentiles for the 1963-1977 period for share turnover. When we create portfolios using the proportionate spread we use the 33rd and 67th percentiles for 1993, as spread data is not available prior to 1993. Firms is the number of firms in a portfolio for a given year. Actual Percent is the percent of payers in a given portfolio. The Predicted Percent of payers for each portfolio in a given year *t* is equal to the average predicted probability of dividend for that portfolio. We estimate the individual firm's probability to pay a dividend by using the average coefficients from 1963-1977 and the values of the explanatory variables for the firm for year *t* in the logistic model.

	Low				$TURN_t$				High			
Year	Firms	Actual Percent	Predicted Percent	Predicted – Actual	Firms	Actual Percent	Predicted Percent	Predicted – Actual	Firms	Actual Percent	Predicted Percent	Predicted – Actual
Panel A												
1978	616	72.24	66.22	– 6.02	953	75.97	70.99	– 4.98	1,168	64.64	59.77	– 4.87
1979	733	65.76	62.07	– 3.69	992	73.69	68.81	– 4.88	1,195	59.08	56.83	– 2.25
1980	556	64.21	58.13	– 6.08	849	74.44	65.72	– 8.72	1,496	56.48	52.28	– 4.21
1981	633	61.45	57.18	– 4.28	911	66.63	64.52	– 2.11	1,479	48.34	53.21	4.86
1982	635	49.45	49.99	0.54	943	54.19	55.03	0.84	1,554	50.00	52.19	2.19
1983	371	48.52	45.41	– 3.11	702	52.71	50.38	– 2.32	2,165	43.56	42.08	– 1.47
1984	653	39.36	43.80	4.45	970	42.89	49.76	6.87	1,812	41.28	49.17	7.88
1985	496	33.06	36.46	3.39	816	41.67	43.86	2.19	2,067	40.88	42.58	1.70
1986	440	25.45	29.98	4.53	667	37.18	37.64	0.46	2,343	37.99	37.71	– 0.27
1987	421	29.93	30.71	0.78	653	30.78	36.24	5.46	2,602	33.32	34.95	1.63
1988	687	27.80	34.73	6.93	934	31.16	39.94	8.79	1,960	34.64	41.50	6.86
1989	556	28.78	34.49	5.71	757	31.97	37.92	5.95	2,140	34.39	37.47	3.08
1990	663	26.85	35.62	8.77	799	34.79	42.26	7.47	1,930	34.87	40.44	5.57
1991	613	27.08	33.42	6.34	661	35.25	41.41	6.16	2,129	33.07	34.32	1.26
1992	483	31.68	36.73	5.05	617	41.17	44.31	3.15	2,485	28.13	31.20	3.07
1993	342	37.13	39.97	2.83	568	43.13	43.72	0.58	2,894	25.57	28.26	2.69
1994	371	36.12	42.30	6.18	628	38.69	45.68	6.99	3,160	23.92	30.72	6.80
1995	308	36.36	44.01	7.65	576	41.84	47.68	5.84	3,341	23.38	28.16	4.79
1996	249	37.75	42.41	4.66	522	37.55	47.45	9.90	3,749	22.11	26.59	4.48
1997	224	33.48	42.14	8.66	506	35.38	43.53	8.15	3,786	21.50	26.21	4.71
1998	198	36.87	48.86	11.99	485	31.96	44.23	12.28	3,688	21.45	27.17	5.72
1999	144	32.64	49.17	16.53	441	34.69	46.04	11.34	3,458	21.69	27.85	6.16
2000	161	29.81	49.27	19.46	368	33.15	44.61	11.46	3,366	20.47	25.96	5.49
2001	297	23.57	34.66	11.10	476	26.47	32.04	5.57	2,662	21.79	25.11	3.33

Panel B

	Low				PS_t				High			
Year	Firms	Actual Percent	Predicted Percent	Predicted – Actual	Firms	Actual Percent	Predicted Percent	Predicted – Actual	Firms	Actual Percent	Predicted Percent	Predicted – Actual
1993	1,026	61.21	57.44	– 3.77	1,058	26.18	28.48	2.30	1,025	7.80	15.94	8.13
1994	1,123	59.13	61.52	2.39	1,133	22.15	30.60	8.45	1,154	7.80	16.59	8.79
1995	1,489	48.22	50.29	2.07	1,137	20.49	26.15	5.66	986	7.00	15.38	8.38
1996	1,879	40.61	44.39	3.79	1,292	15.17	20.77	5.60	935	8.98	15.66	6.67
1997	1,917	40.58	44.39	3.81	1,239	13.72	21.26	7.54	1,071	7.66	12.95	5.29
1998	2,357	34.03	39.49	5.46	1,079	13.53	22.88	9.35	900	7.56	14.53	6.98
1999	2,155	33.27	38.61	5.34	1,029	14.67	26.01	11.34	847	9.09	15.88	6.79
2000	1,937	27.21	31.81	4.60	963	20.56	30.57	10.01	985	13.50	20.87	7.37
2001	1,624	16.56	21.75	5.18	664	20.63	26.90	6.27	1,137	32.54	34.26	1.72

Table 7
Coefficient estimates from a logistic regression to predict dividend payers including share turnover as an explanatory variable for two portfolios of firms based on whether the firm paid a dividends year *t*-1 or not

The sample consists of all firms with available data from CRSP and Compustat and is separated into firms that did not pay dividend in year *t*-1 and firms that did. For each year *t* of the 1963-2001 period, for each portfolio, we estimate a logistic regression. The dependent variable is 1.0 in year *t* if a firm pays dividends and 0.0 otherwise. As explanatory variables we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t), and the share turnover for year *t* ($TURN_t$). The table shows the average of the estimated coefficients for a period and the respective *t*-statistics.

Dependent variable is the probability of the firm to pay dividend in year *t*

	Non-Payers			Payers		
	1963-1977	1978-1992	1993-2001	1963-1977	1978-1992	1993-2001
Intercept	– 1.54	– 1.57	– 2.32	3.03	3.82	3.08
	(– 5.25)	(– 8.92)	(– 9.10)	(5.02)	(19.28)	(12.19)
NYM_t	0.21	0.42	0.36	0.75	0.68	0.47
	(4.42)	(11.66)	(7.92)	(12.86)	(18.77)	(21.74)
V_t/A_t	– 0.90	– 0.42	– 0.43	0.81	0.04	0.48
	(– 5.38)	(– 5.50)	(– 3.63)	(1.42)	(0.26)	(2.35)
dA_t/A_t	0.63	– 0.12	– 0.73	2.00	1.33	0.58
	(2.05)	(– 0.86)	(– 3.09)	(4.30)	(5.32)	(3.21)
$ETOA_t$	12.98	6.38	5.12	19.24	8.82	4.90
	(8.85)	(15.71)	(4.29)	(7.56)	(7.19)	(10.91)
$TURN_t$	– 0.48	– 0.57	– 0.58	– 0.67	– 0.45	– 0.33
	(– 5.20)	(– 6.10)	(– 6.53)	(– 4.61)	(– 2.67)	(– 3.62)

Table 8
Actual and predicted percent of firms initiating dividend using average logistic regression estimates from the training period of 1963-1977

The sample is separated into firms that did not pay a dividend in year *t*-1 and firms that did. For each year between 1963-1977 we estimate a logistic regression by portfolio to explain whether a firm pays dividend in year *t*. As explanatory variables in the first model we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), and the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t). In the second model we add share turnover ($TURN_t$) as an explanatory variable. Firms is the number of firms for a given year. Actual Percent is the percent of payers in a given portfolio. The Predicted Percent of payers for each portfolio in a given year *t* we estimate by using the average coefficients from 1963-1977 and the values of the explanatory variables for each firm for year *t* in the logistic model.

	No dividend in year *t-1*						Dividend in year *t-1*					
			(1)		(2)				(1)		(2)	
		Actual	Predicted	Predicted	Predicted	Predicted		Actual	Predicted	Predicted	Predicted	Predicted
	Firms	Percent	Percent	– Actual	Percent	– Actual	Firms	Percent	Percent	– Actual	Percent	– Actual
1978	870	12.99	11.77	– 1.22	11.45	– 1.53	1,867	97.00	97.01	0.01	97.00	0.00
1979	1,034	7.74	10.74	3.00	10.85	3.11	1,886	97.51	97.10	– 0.41	97.08	– 0.42
1980	1,060	6.32	8.99	2.67	8.56	2.24	1,841	95.98	96.29	0.31	96.24	0.26
1981	1,284	4.91	9.28	4.37	9.38	4.48	1,739	94.77	96.45	1.68	96.40	1.63
1982	1,500	3.47	8.05	4.58	7.93	4.47	1,632	94.98	95.00	0.02	94.97	– 0.01
1983	1,702	3.00	5.93	2.93	5.51	2.52	1,536	93.88	95.18	1.30	94.91	1.03
1984	2,036	3.88	7.73	3.85	7.78	3.90	1,399	95.93	95.79	– 0.13	95.75	– 0.17
1985	2,055	3.07	6.13	3.07	5.80	2.74	1,324	97.13	95.36	– 1.77	95.11	– 2.02
1986	2,181	2.57	5.57	3.00	5.00	2.43	1,269	94.09	94.09	0.00	93.52	– 0.57
1987	2,497	3.08	5.88	2.80	5.23	2.15	1,179	94.74	94.78	0.04	94.35	– 0.39
1988	2,475	4.40	6.49	2.08	6.20	1.80	1,106	95.12	95.46	0.34	95.28	0.17
1989	2,352	4.08	6.37	2.29	5.81	1.72	1,101	94.64	95.57	0.93	95.40	0.76
1990	2,287	3.37	6.75	3.38	6.19	2.82	1,105	95.20	94.66	– 0.54	94.41	– 0.79
1991	2,293	2.35	5.48	3.12	4.80	2.44	1,110	94.50	93.17	– 1.33	92.84	– 1.66
1992	2,494	3.17	5.41	2.24	4.66	1.49	1,091	94.13	94.17	0.04	93.84	– 0.29
1993	2,719	2.83	4.93	2.10	3.98	1.15	1,085	95.39	94.48	– 0.91	94.18	– 1.21
1994	3,055	2.72	5.72	3.01	4.81	2.09	1,104	95.11	95.57	0.46	95.36	0.25
1995	3,135	2.33	5.56	3.23	4.43	2.10	1,090	97.34	95.92	– 1.42	95.63	– 1.71
1996	3,419	1.73	5.36	3.64	4.22	2.50	1,101	96.28	95.99	– 0.29	95.41	– 0.87
1997	3,445	1.36	5.11	3.75	3.97	2.61	1,071	95.33	95.72	0.39	95.33	– 0.01
1998	3,357	1.22	5.85	4.63	4.63	3.41	1,014	96.45	96.25	– 0.20	95.68	– 0.77
1999	3,096	1.10	5.84	4.74	4.68	3.58	947	96.73	95.79	– 0.93	95.29	– 1.44
2000	3,012	1.00	6.11	5.11	4.50	3.50	883	93.88	94.99	1.11	94.00	0.12
2001	2,636	0.72	4.89	4.17	3.86	3.14	799	94.74	91.83	– 2.92	91.00	– 3.74

Table 9
Actual and predicted percent of dividend payers for two portfolios based on tax-advantaged institutional ownership using average logistic regression estimates from the training period of 1963-1977

For each year between 1963-1977 we estimate a logistic regression to explain whether a firm pays dividend in year *t*. As explanatory variables in the first model we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), and the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t). The second model includes share turnover ($TURN_t$) as an explanatory variable. We construct the sorting variable as the percentage ownership of insurance companies, pension funds, and university endowments in the firm for June of year *t*. We then divide the sample into three portfolios using the average 33rd and 67th percentiles of the sorting variable for 1980-1984. We do not report the results for the middle portfolio. Firms is the number of firms in a portfolio for a given year. Actual Percent is the percent of payers in a given portfolio. The Predicted Percent of payers for each portfolio in a given year *t* is equal to the average predicted probability of dividend for that portfolio. We estimate the individual firm's probability to pay a dividend by using the average coefficients from 1963-1977 and the values of the explanatory variables for the firm for year *t* in the logistic model.

	Low ownership of tax-advantaged institutions						High ownership of tax-advantaged institutions					
			(1)		(2)				(1)		(2)	
		Actual	Predicted	Predicted	Predicted	Predicted		Actual	Predicted	Predicted	Predicted	Predicted
	Firms	Percent	Percent	– Actual	Percent	– Actual	Firms	Percent	Percent	– Actual	Percent	– Actual
1980	1,876	52.99	49.15	– 3.83	46.32	– 6.66	856	83.53	84.29	0.76	79.30	– 4.23
1981	1,882	44.21	45.73	1.52	45.43	1.22	943	78.90	82.32	3.42	79.26	0.36
1982	1,930	37.36	41.33	3.97	40.52	3.16	1,029	74.54	78.17	3.63	73.02	– 1.51
1983	1,923	32.29	35.51	3.22	31.79	– 0.50	1,159	67.73	71.64	3.91	63.57	– 4.16
1984	2,091	27.64	35.69	8.05	35.67	8.03	1,178	64.86	74.19	9.34	69.21	4.35
1985	1,883	24.27	30.97	6.70	28.81	4.54	1,290	61.78	68.85	7.06	59.59	– 2.19
1986	1,904	20.75	28.40	7.65	24.85	4.11	1,341	58.02	65.57	7.55	52.89	– 5.12
1987	2,053	17.83	27.05	9.22	22.93	5.10	1,396	53.65	64.45	10.79	50.95	– 2.71
1988	1,074	8.10	14.55	6.45	15.45	7.35	1,702	52.23	65.60	13.37	56.78	4.55
1989	1,103	7.43	14.52	7.08	14.23	6.79	1,730	52.49	64.29	11.81	52.82	0.34
1990	1,015	7.59	15.99	8.40	15.88	8.29	1,756	52.39	66.20	13.81	55.89	3.50
1991	970	6.49	13.63	7.13	12.67	6.18	1,732	51.44	62.59	11.14	50.45	– 0.99
1992	943	7.64	15.69	8.06	13.61	5.97	1,923	47.11	60.11	12.99	47.09	– 0.03
1993	897	7.13	15.81	8.68	12.18	5.05	2,004	45.76	59.20	13.44	44.44	– 1.32
1994	815	6.26	14.80	8.54	12.63	6.37	2,322	40.44	59.81	19.37	45.92	5.48
1995	845	6.27	14.52	8.25	11.03	4.76	2,395	38.75	58.93	20.18	42.81	4.07
1996	1,062	9.04	18.44	9.41	14.81	5.77	2,535	35.78	56.73	20.95	39.67	3.89
1997	1,111	8.91	18.14	9.23	13.85	4.93	2,445	35.09	56.55	21.45	39.37	4.28
1998	1,267	8.68	19.65	10.96	15.54	6.86	2,442	33.74	57.42	23.68	39.14	5.40

Table 10
Actual and predicted percent of dividend payers for two portfolios based on institutional ownership using average logistic regression estimates from the training period of 1963-1977

For each year between 1963-1977, for the whole sample, we estimate a logistic regression to explain whether a firm pays dividend in year *t*. As explanatory variables in the first model we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), and the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t). In the second model we add share turnover ($TURN_t$) to the explanatory variables. Two portfolios are created and analysis is performed for each. The first portfolio consists of firms with low ownership of tax-advantaged clients - firms with more than 3.0% mutual fund ownership and at most 1.0% ownership of insurance companies, pension funds, and university endowments. The second portfolio consists of firms with high ownership of tax-advantaged clients - firms with less than 3.0% ownership of mutual funds and more than 5.0% ownership of insurance companies, pension funds, and university endowments. Firms is the number of firms in a portfolio for a given year *t*. Actual Percent is the percent of payers in a given portfolio. The Predicted Percent of payers for each portfolio in a given year *t* is equal to the average predicted probability of dividend for that portfolio. We estimate the individual firm's probability to pay a dividend by using the average coefficients from 1963-1977 and the values of the explanatory variables for the firm for year *t* in the logistic model.

	Low ownership of tax-advantaged institutions						High ownership of tax-advantaged institutions					
			(1)		(2)				(1)		(2)	
		Actual	Predicted	Predicted	Predicted	Predicted		Actual	Predicted	Predicted	Predicted	Predicted
	Firms	Percent	Percent	– Actual	Percent	– Actual	Firms	Percent	Percent	– Actual	Percent	– Actual
1980	98	78.57	68.40	– 10.18	67.77	– 10.81	209	79.90	80.29	0.39	78.85	– 1.06
1981	105	70.48	64.72	– 5.75	62.39	– 8.09	239	76.57	78.63	2.06	80.22	3.65
1982	95	64.21	63.11	– 1.10	64.23	0.02	287	73.17	76.59	3.42	76.10	2.93
1983	125	56.00	48.34	– 7.66	46.38	– 9.62	306	68.30	70.65	2.34	69.13	0.83
1984	143	46.85	52.26	5.41	53.76	6.90	290	64.83	70.77	5.94	71.34	6.51
1985	136	41.91	48.07	6.16	44.80	2.89	327	64.22	67.10	2.88	63.81	– 0.41
1986	146	38.36	40.63	2.27	34.84	– 3.52	367	62.67	67.54	4.87	62.17	– 0.50
1987	159	29.56	40.88	11.32	33.65	4.09	367	64.31	69.31	5.00	62.51	– 1.80
1988	128	29.69	42.83	13.15	42.68	12.99	477	57.86	69.51	11.65	66.78	8.92
1989	79	31.65	41.10	9.46	41.14	9.49	553	59.67	67.78	8.11	62.50	2.82
1990	101	35.64	46.73	11.08	44.19	8.55	529	58.03	69.50	11.47	64.56	6.53
1991	211	30.81	42.14	11.34	36.83	6.03	358	51.96	61.94	9.99	56.82	4.86
1992	283	26.50	38.36	11.86	33.12	6.62	348	44.54	53.29	8.75	47.41	2.87
1993	369	20.87	36.61	15.74	27.35	6.49	332	44.88	52.49	7.61	46.78	1.90
1994	332	19.88	35.94	16.06	30.30	10.42	406	43.84	54.10	10.26	50.38	6.54
1995	276	19.57	35.21	15.64	27.88	8.32	375	42.40	52.21	9.81	46.52	4.12
1996	505	15.45	32.58	17.13	25.16	9.71	193	29.02	40.77	11.76	32.90	3.89
1997	557	15.08	32.99	17.91	24.94	9.86	174	22.41	34.14	11.73	27.95	5.53
1998	627	15.63	36.82	21.19	29.97	14.34	141	10.64	28.21	17.57	21.47	10.83

Table 11
Actual and predicted percent of dividend payers for two portfolios based on repurchased shares using average logistic regression estimates from the training period of 1963-1977 and estimated using the whole sample

For each year between 1971-1977, for the whole sample, we estimate a logistic regression to explain whether a firm pays dividend in year *t*. As explanatory variables in the first model we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), and the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t). In the second model we add share turnover ($TURN_t$) to the explanatory variables. Two portfolios are created and analysis is performed for each. The first portfolio consists of firms with no shares repurchased for year *t*. The second portfolio consists of all firms with positive number of shares repurchased in year t. Firms is the number of firms in a portfolio for a given year *t*. Actual Percent is the percent of payers in a given portfolio. The Predicted Percent of payers for each portfolio in a given year *t* is equal to the average predicted probability of dividend for that portfolio. We estimate the individual firm's probability to pay a dividend by using the average coefficients from 1963-1977 and the values of the explanatory variables for the firm for year *t* in the logistic model.

	No repurchase						Repurchase					
			(1)		(2)				(1)		(2)	
		Actual	Predicted	Predicted	Predicted	Predicted		Actual	Predicted	Predicted	Predicted	Predicted
	Firms	Percent	Percent	– Actual	Percent	– Actual	Firms	Percent	Percent	– Actual	Percent	– Actual
1978	2,070	69.13	66.75	– 2.38	64.11	– 5.02	642	73.68	68.02	– 5.66	67.91	– 5.77
1979	2,148	62.85	62.10	– 0.75	60.29	– 2.56	739	73.61	66.91	– 6.70	67.10	– 6.51
1980	2,199	60.12	59.61	– 0.51	55.16	– 4.96	666	72.52	64.65	– 7.87	63.46	– 9.06
1981	2,264	52.96	57.30	4.34	55.23	2.27	713	67.46	63.20	– 4.26	63.93	– 3.53
1982	2,260	46.19	51.78	5.58	49.04	2.85	813	64.33	62.68	– 1.65	61.53	– 2.80
1983	2,404	42.72	47.25	4.53	41.65	– 1.07	756	56.08	56.13	0.05	51.73	– 4.35
1984	2,484	35.10	45.93	10.82	44.24	9.13	884	58.14	61.39	3.24	59.24	1.10
1985	2,357	34.28	42.61	8.33	37.58	3.30	938	54.16	57.57	3.41	52.81	– 1.35
1986	2,441	30.19	39.68	9.49	32.48	2.29	921	52.55	54.32	1.77	47.59	– 4.96
1987	2,374	23.55	35.20	11.65	28.50	4.96	1,182	50.85	56.45	5.60	46.91	– 3.94
1988	2,213	23.27	36.60	13.33	33.14	9.87	1,231	48.98	56.76	7.78	51.65	2.67
1989	2,351	24.88	37.79	12.91	31.40	6.52	979	52.81	56.32	3.51	50.44	– 2.37
1990	2,207	23.61	38.48	14.87	32.71	9.10	1,064	54.32	60.65	6.32	55.36	1.03
1991	2,312	24.91	37.21	12.30	30.17	5.25	969	50.98	55.97	4.99	48.21	– 2.77
1992	2,616	24.81	38.35	13.54	29.68	4.87	840	50.60	56.79	6.19	48.81	– 1.78
1993	2,780	24.10	37.55	13.45	27.41	3.31	885	46.89	55.76	8.87	45.94	– 0.95
1994	3,029	20.53	38.64	18.10	28.98	8.44	980	49.59	58.82	9.23	50.47	0.88
1995	2,940	19.39	37.69	18.31	26.75	7.36	1,090	49.17	59.16	9.98	47.67	– 1.50
1996	2,897	17.36	35.70	18.34	24.10	6.74	1,213	47.82	60.36	12.55	47.66	– 0.15
1997	2,656	15.96	34.33	18.37	22.85	6.88	1,326	45.25	58.37	13.12	45.93	0.68
1998	2,250	14.71	34.15	19.43	22.89	8.18	1,622	40.20	58.47	18.28	44.07	3.87
1999	1,954	13.97	33.97	19.99	22.82	8.85	1,659	38.70	56.84	18.14	43.30	4.60
2000	1,962	12.23	33.47	21.24	20.37	8.14	1,489	40.23	60.74	20.51	44.63	4.40
2001	1,682	15.93	33.62	17.69	21.36	5.43	1,353	35.40	52.33	16.93	37.17	1.77

Table 12
Actual and predicted percent of dividend payers using average logistic regression estimates from the training period of 1971-1977

For each year between 1971-1977 we estimate a logistic regression to explain whether a firm pays dividend in year *t*. As explanatory variables in the first model we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), and the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t). In the second model we add share turnover ($TURN_t$) as an explanatory variable. In the third model share turnover for a given firm is calculated net of shares repurchased for year *t*. Since share repurchase data is available after 1971 for comparability all models are estimated from 1971 onward. Firms is the number of firms for a given year. Actual Percent is the percent of payers in a given portfolio. The Predicted Percent of payers for each portfolio in a given year *t* we estimate by using the average coefficients from 1971-1977 and the values of the explanatory variables for each firm for year *t* in the logistic model.

			(1)		(2)		(3)	
Year	Firms	Actual Percent	Predicted Percent	Predicted – Actual	Predicted Percent	Predicted – Actual	Predicted Percent	Predicted – Actual
1978	2,717	70.67	62.55	– 8.11	57.88	– 12.78	58.54	– 12.13
1979	2,861	66.79	59.10	– 7.69	55.45	– 11.35	56.06	– 10.73
1980	2,891	63.37	55.34	– 8.03	49.24	– 14.12	49.73	– 13.64
1981	3,009	56.86	53.46	– 3.40	49.76	– 7.10	50.28	– 6.59
1982	3,131	51.17	49.98	– 1.18	44.95	– 6.21	45.52	– 5.65
1983	3,234	46.13	44.21	– 1.92	36.08	– 10.05	36.81	– 9.33
1984	3,420	41.55	45.35	3.80	40.82	– 0.73	41.53	– 0.02
1985	3,370	40.00	42.30	2.30	34.39	– 5.61	35.21	– 4.79
1986	3,437	36.37	39.52	3.15	29.19	– 7.18	30.17	– 6.20
1987	3,656	32.66	38.30	5.64	27.29	– 5.37	28.47	– 4.19
1988	3,574	32.48	39.59	7.11	32.66	0.17	33.51	1.03
1989	3,445	33.03	38.62	5.58	29.64	– 3.39	30.40	– 2.64
1990	3,386	33.34	41.37	8.02	32.98	– 0.37	33.80	0.46
1991	3,393	32.51	38.40	5.90	28.81	– 3.69	29.46	– 3.05
1992	3,567	31.01	37.93	6.92	27.44	– 3.56	28.06	– 2.94
1993	3,790	29.34	36.80	7.45	24.80	– 4.54	25.45	– 3.89
1994	4,136	27.37	38.77	11.40	27.02	– 0.35	27.79	0.42
1995	4,215	26.90	38.31	11.41	25.16	– 1.74	25.96	– 0.94
1996	4,497	24.82	37.22	12.40	23.25	– 1.56	24.09	– 0.73
1997	4,507	23.70	35.92	12.22	21.95	– 1.75	22.83	– 0.87
1998	4,369	23.32	38.21	14.89	22.98	– 0.35	24.13	0.81
1999	4,043	23.50	38.50	15.00	23.71	0.21	25.01	1.51
2000	3,894	22.06	39.19	17.13	21.57	– 0.49	22.99	0.93
2001	3,435	22.59	36.31	13.72	20.14	– 2.45	21.12	– 1.47

Table 13
Estimates from a logistic regression to predict dividend payers including share turnover and a dummy indicating whether the firm has shares reserved for conversion as an explanatory variables

The sample consists of all firms with available data from CRSP and Compustat. For each year *t* of the 1963-2001 period we estimate a logistic regression. The dependent variable is 1.0 in year *t* if a firm pays dividends and 0.0 otherwise. As explanatory variables we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t), the share turnover for year *t* ($TURN_t$), and a dummy variable indicating whether the firm has positive number of shares reserved for conversion ($CONV_t$). The table reports the average estimated coefficient for a given period and the *t*-statistic of whether the average estimate is significantly different from zero.

Dependent variable is the firm's decision to pay a dividend in year *t*

Intercept	NYM_t	V_t/A_t	dA_t/A_t	E_t/A_t	$TURN_t$	$CONV_t$
1963-1977						
2.96	0.83	-0.71	-0.51	14.07	-1.57	-0.76
(16.10)	(27.85)	(-9.05)	(-2.17)	(12.15)	(-9.08)	(-18.82)
1978-1995						
3.61	0.94	-0.68	-0.70	6.17	-1.24	-0.86
(31.57)	(55.02)	(-11.72)	(-7.40)	(17.78)	(-17.16)	(-9.11)

Table 14
Actual and predicted percent of dividend payers using average logistic regression estimates from the training period of 1963-1977

For each year between 1963-1977 we estimate a logistic regression to explain whether a firm pays dividend in year *t*. As explanatory variables in the first model we use the earnings-to-assets ratio (E_t/A_t), the market-to-book ratio (V_t/A_t), the growth rate of assets (dA_t/A_t), the natural logarithm of the ratio of firm market capitalization to NYSE median market capitalization (NYM_t), and a dummy variable indicating whether the firm has positive number of shares reserved for conversion ($CONV_t$). In the second model we add share turnover ($TURN_t$) as an explanatory variable. Firms is the number of firms for a given year. Actual Percent is the percent of payers in a given portfolio. The Predicted Percent of payers for each portfolio in a given year *t* we estimate by using the average coefficients from 1963-1977 and the values of the explanatory variables for each firm for year *t* in the logistic model.

			(1)		(2)	
Year	Firms	Actual Percent	Predicted Percent	Predicted – Actual	Predicted Percent	Predicted – Actual
1978	2,737	70.30	64.05	– 6.25	62.47	– 7.83
1979	2,920	65.72	60.65	– 5.07	59.74	– 5.98
1980	2,901	63.22	58.26	– 4.96	55.08	– 8.14
1981	3,023	56.60	56.48	– 0.12	55.42	– 1.18
1982	3,132	51.15	52.41	1.26	50.40	– 0.75
1983	3,238	46.11	46.88	0.77	42.06	– 4.04
1984	3,435	41.37	47.07	5.70	45.61	4.25
1985	3,379	39.92	44.17	4.25	39.72	– 0.21
1986	3,450	36.23	40.94	4.71	34.55	– 1.68
1987	3,676	32.48	39.42	6.94	32.39	– 0.09
1988	3,581	32.42	40.90	8.48	37.37	4.95
1989	3,453	32.96	39.93	6.98	34.52	1.56
1990	3,392	33.28	42.12	8.83	37.13	3.84
1991	3,403	32.41	39.45	7.04	33.04	0.63
1992	3,585	30.85	39.09	8.24	31.74	0.89
1993	3,804	29.23	37.96	8.73	29.14	– 0.09
1994	4,159	27.24	39.66	12.42	31.44	4.19
1995	4,225	26.84	40.01	13.17	29.82	2.98

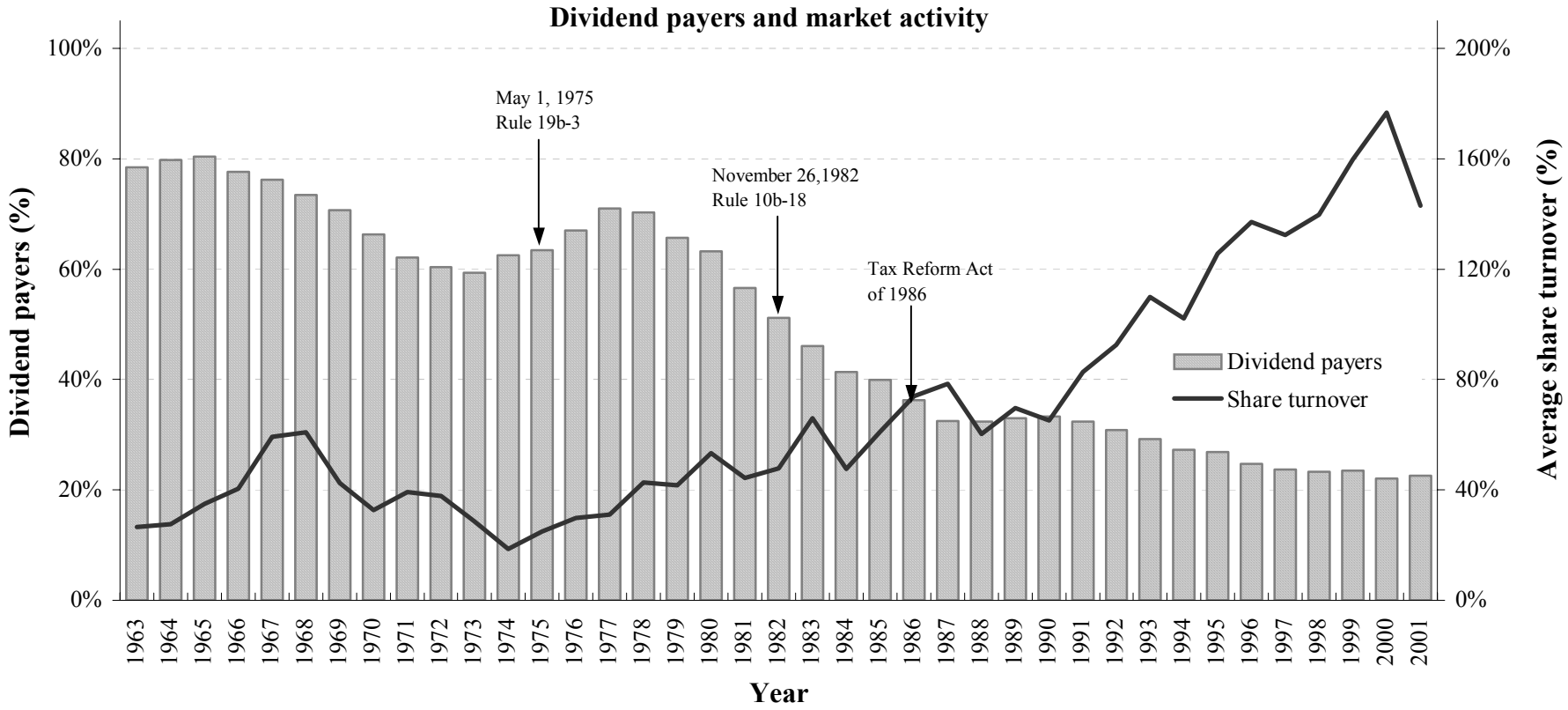

Fig. 1. The sample consists of all firms with publicly traded common stock with available information on the CRSP monthly files and the Compustat annual files. Dividend payers are firms that paid dividend in fiscal year *t* as reported by the Compustat annual files. Share turnover is the ratio of shares traded to shares outstanding for calendar year *t* as reported by the Compustat annual files. On May 1, 1975 SEC deregulated the fixed commission rates on NYSE. On November 26, 1982 SEC accepted Rule 10b-18 that was more lenient to companies performing open market share repurchases. The Tax Reform Act of 1986 reduced the tax advantage of capital gains versus dividend income.

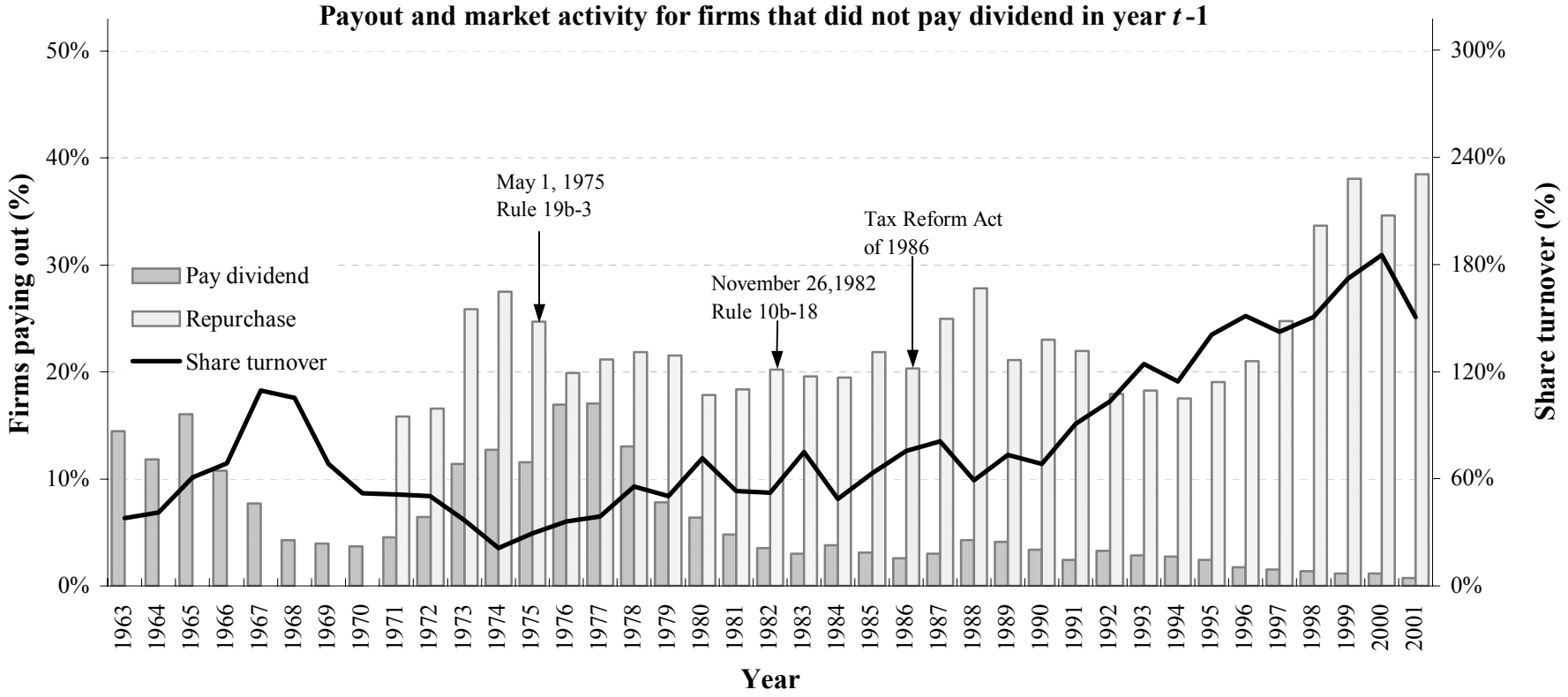

Fig. 2. The sample consists of all firms with publicly traded common stock with available information on the CRSP monthly files and the Compustat annual files that did not pay dividend in fiscal year *t*-1. Dividend and share repurchase information is obtained from the Compustat annual files. Share turnover is the ratio of shares traded to shares outstanding for calendar year *t* as reported by the Compustat annual files. On May 1, 1975 SEC deregulated the fixed commission rates on NYSE. On November 26, 1982 SEC accepted Rule 10b-18 that was more lenient to companies performing open market share repurchases. The Tax Reform Act of 1986 reduced the tax advantage of capital gains versus dividend income.

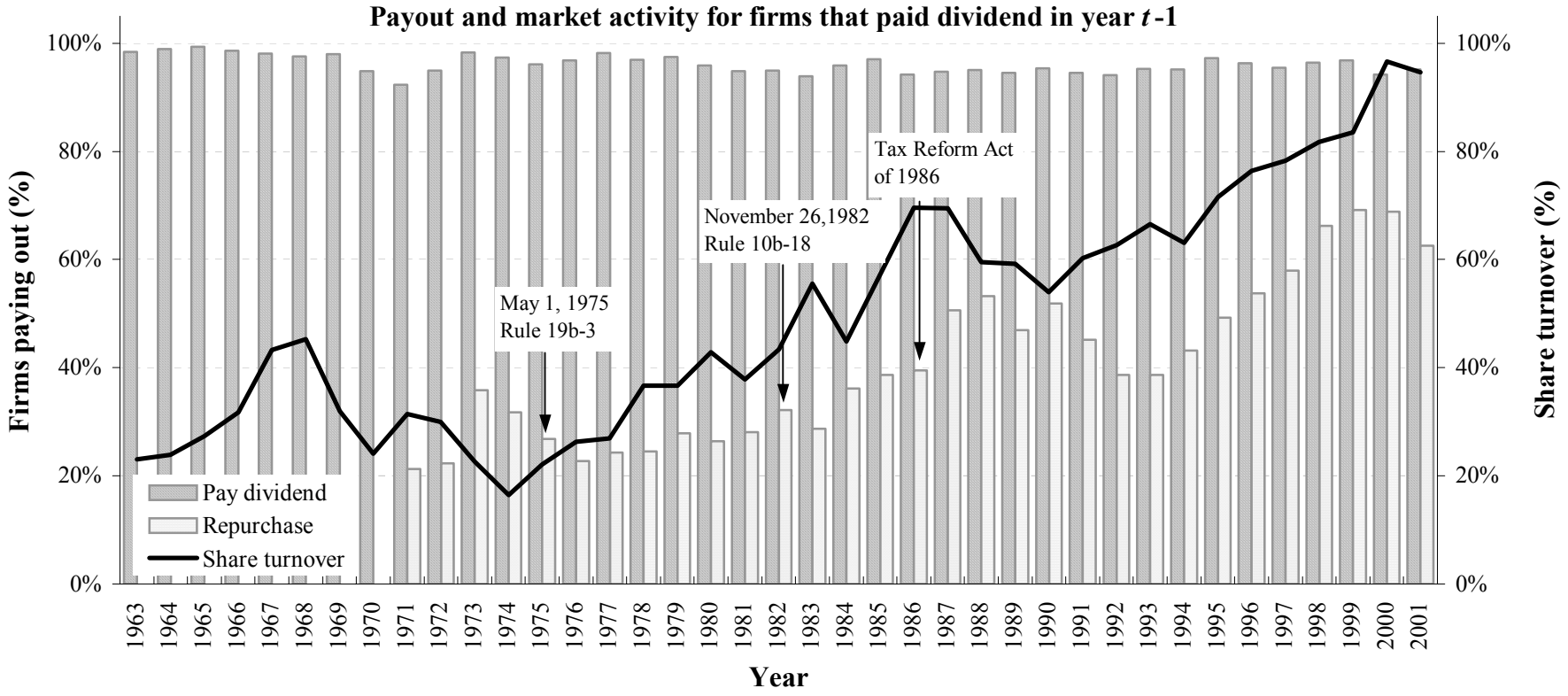

Fig. 3. The sample consists of all firms with publicly traded common stock with available information on the CRSP monthly files and the Compustat annual files that paid dividend in fiscal year *t*-1. Dividend and share repurchase information is obtained from the Compustat annual files. Share turnover is the ratio of shares traded to shares outstanding for calendar year *t* as reported by the Compustat annual files. On May 1, 1975 SEC deregulated the fixed commission rates on NYSE. On November 26, 1982 SEC accepted Rule 10b-18 that was more lenient to companies performing open market share repurchases. The Tax Reform Act of 1986 reduced the tax advantage of capital gains versus dividend income.