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Disappearing and reappearing dividends☆

Roni Michaely[a,*], Amani Moin[b]

[a] University of Hong Kong, ECGI, Hong Kong
[b] Commodity Futures Trading Commission, USA

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ABSTRACT

We decompose the decrease (1970s–2000) and subsequent recovery (2000–2018) in the fraction of dividend-paying firms. Changes in firm characteristics and proclivity to pay (probability of paying dividends conditional on characteristics) each drive half of the dividend disappearance. A higher proclivity drives 82% of the dividend reappearance. The remaining 18% is driven by a single characteristic: reduced earnings volatility. Changing characteristics are associated with low-profitability, high-earnings-volatility firms. Changing proclivity is associated with stable, profitable firms. Rather than dividend initiations or omissions, newly listed and delisted firms drive trends. Finally, the magnitude and duration of disappearing total payout is substantially smaller than that of dividends, indicating some substitution between dividends and repurchases.

1. Introduction

Payout policy is one of the most visible financial decisions a firm makes. Although these decisions are inherently important, they can also convey information to capital markets about a range of firms prospects, including growth opportunities (e.g., Miller and Rock, 1985), cash-flow volatility (Michaely et al., 2021), and corporate control (e.g., Jensen, 1986; Chetty and Saez, 2010). At the aggregate level, these changes have practical implications regarding factors such as equity value and discount rates (e.g., Shiller, 1981; Campbell and Shiller, 1988; Boudoukh et al., 2007). Therefore, changes in payout policy have attracted significant attention from both market participants and researchers (for a comprehensive review of this literature, see Farre-Mensa et al., 2014). For example, the discovery that a systemic shift in firms payout policies had begun in the late 1970s was met with justified interest and scrutiny. Fama and French (2001) show a startling decline in the fraction of firms paying dividends (the phenomenon known as disappearing dividends) and Grullon and Michaely (2002) show a systemic substitution of repurchases for dividends.

This paper extends and complements these earlier studies along several dimensions. We first show that the fraction of dividend-paying firms begins to increase around the turn of the century. We refer to this reversal of the disappearing dividends as "reappearing dividends."[1] The central question in the paper is why the fraction of dividend-paying firms falls from 73% in 1978 to 23% in 2000 and then increases to 36% in 2018. Broadly speaking, we examine two not-mutually-exclusive possibilities. First, there could be changes in the relation between the fundamental characteristics and the decision to pay dividends; for example, firms dividend policy may have become

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* Corresponding author.
E-mail addresses: ronim@hku.hk (R. Michaely), amoin@cftc.gov (A. Moin).

[1] Similar to Fama and French (2001), we measure dividends "disappearing" and "reappearing" with regard to the fraction of dividend-paying firms relative to traded firms.

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less sensitive to changes in earnings. We define this as a decrease in the proclivity to pay dividends (probability of paying dividends conditional on firm characteristics). Second, there may have been changes in the distributions of fundamental characteristics, such as profitability and earnings volatility, known to be related to the decision to pay dividends. We then investigate the role of characteristics omitted from the empirical model. IPO year is an example of one such characteristic. If firms with IPOs later in the sample have a lower proclivity to pay dividends, the fraction of dividend payers will decrease as their presence increases. Finally, we examine changes in market conditions. For example, SEC rule 10-b made it easier for firms to repurchase shares in lieu of paying dividends and thus changed firms propensity to pay dividends.

We use a version of the logit model from Fama and French (2001), modified to include earnings volatility, to estimate the probability that a firm pays dividends. We find a substantial number of firms with characteristics similar to those of dividend payers in earlier years choosing not to pay dividends after 1977. This change in how firms set their dividend policy, or the changing proclivity, accounts for 47.38% of the disappearing dividends. The remaining 52.62% is driven by an influx of firms with characteristics, notably lower profitability and higher earnings volatility, that are different from those of previously listed dividend-paying firms. Naturally, the proclivity to pay dividends depends on the specific model being used. For example, we measure a greater change in the proclivity to pay dividends when we omit earnings volatility from the empirical model.

Reappearing dividends follow a different pattern from that of disappearing dividends. A substantial 81.72% of the reappearing dividends can be attributed to changes in the proclivity to pay dividends. Changing firm characteristics, especially earnings volatility, drive the remaining 18.28%. Except for earnings volatility, we find no reversal in the distribution of most firm characteristics during the 2000–2018 reappearing-dividends period. Although our sample of listed firms drops from a high of 4448 (1997) to 2187 (2018), the decline is not driven by unprofitable firms delisting at particularly high rates (consistent with Grullon et al., 2019). Changes in most firm characteristics have less explanatory power in the reappearing-dividends phenomenon. The notable exception is changes in earnings volatility, which is an important factor during both the disappearing-dividend and reappearing-dividend eras.

A closer examination into changes in the proclivity to pay dividends reveals that firms listed after 1977 are responsible. Neither disappearing nor reappearing dividends occur in firms that had their IPO before 1978. Consistent with Lintner (1956) dividend smoothing, firms rarely switch from payer to nonpayer status. However, a lower proclivity to pay dividends is visible particularly in high-profitability and low-earnings-volatility firms that were listed after the late 1970s. Disappearing dividends are then driven by the presence of new firms, with differing characteristics or proclivity to pay dividends. Reappearing dividends occur despite a consistently low number of dividend initiations. The appear to be driven by nonpaying firms delisting, especially firms with high earnings volatility and low proclivity to pay dividends. Firms cohort can thus be considered as a characteristic omitted from the empirical model.

Next, we find the substitution of repurchases for dividends accounts for much of the changing proclivity to pay dividends during the disappearing-dividends period. Compared with the gap between the actual and expected percentage of dividend payers, which reaches a trough of −21.7 percentage points (pp) and persists from the late 1970s until today, the gap between the actual and expected percentage of positive-payout firms is smaller in magnitude and shorter in duration. The gap exhibits a trough of −9.1 pp, and by 1998, the gap between actual and expected firms with positive payout closes. The smaller, shorter-lived gap between the actual and expected percentage of firms with positive payout suggests a smaller change in the total proclivity to pay out. This behavior is consistent with firms substituting share repurchases for dividends. However, firms do not substitute away from repurchases while dividends reappear. Instead, the percentage of firms repurchasing shares continues to increase throughout this time. In fact, repurchases are so popular that the actual number of firms with positive payout exceeds the expected number in almost every year since 2000. As a byproduct, the greater use of repurchases as a result of the regulatory change (rule 10b-18), as well as the impact of IPO cohort year, highlight the importance of changes in market structure and model specification (IPO cohort) on changes in proclivity over time.

Finally, we find that firms delisted from exchanges are the main reason for the reappearing dividends. The number of dividend-paying firms in the United States stays roughly constant from 2000 to 2018, while the total number of listed firms falls. We show that if these firms had not delisted, the percentage of firms that pay dividends would not have increased. Many of these non-dividend-paying firms delist due to a merger or acquisition. Indeed, when we construct a synthetic sample in which no mergers or acquisitions occur after 2000 (but delistings for other reasons still happen), we find that dividends reappear to only one-third of the extent that they actually did.

This paper extends our understanding of the dynamics of dividend policies through several new insights. We find that firm characteristics and the proclivity to pay dividends are each responsible for approximately half of the disappearing-dividends trend, and that both phenomena are attributable to firms listed after the late 1970s. Yet, since the turn of the 21st century, changing proclivity has accounted for most of the reappearance. We also find that most of the reappearing-dividends trend is driven by nonpaying firms delisting from exchanges. Combined with our decomposition of the reappearing-dividends trend, this implies that nonpaying firms that are expected to pay dividends delist at particularly high rates. The portion of the reappearing dividends that is explained by changing firm characteristics can be attributed to the high delisting rate of firms with high earnings volatility. Our findings also highlight the role of the repurchase-dividend substitution. When we consider dividends alone, modern-day firms ostensibly never fully recover the same proclivity to pay that we see in our sample in the 1960s and early 1970s.

However, a different picture emerges once we account for repurchases: firms are more likely to pay out in the 2000s than they were before dividends disappeared.

We organize the rest of the paper as follows. In Section 2, we describe data and general trends. After estimating our baseline logit model (Section 3.1), we address how distributions of characteristics known to be related to the decision to pay dividends change over time (Section 3.2). Next, we ask how the relation between the fundamental characteristics in the logit model and the decision to pay dividends changes over time. Specifically, we quantify how much of dividend trends is due to changing characteristics vs. changing proclivity (Section 3.3) and what types of firms drive the changing proclivity to pay (Section 3.4). Finally, we discuss how other factors, such as potentially difficult-to-quantify firm characteristics or changes in the environment, affect the fraction of dividend-paying firms. We focus on the role of dividend persistence (Section 4.1), the impact of SEC rule 10b-18 (Section 4.2), and the high delisting rate after 2000 (Section 4.3).

2. Data, sample, and general trends

We begin with all firms in the CRSP/Compustat merged fundamentals annual database from 1963 to 2018 that traded on one of the major stock exchanges. We drop firm-year observations with either missing data, assets below $500,000, or book equity below $250,000. As per convention, we also exclude utilities (SIC 4900–4949) and financial firms (SIC 6000–6999). Finally, we analyze only common shares of U.S.-based publicly traded firms (CRSP share code 10 or 11). This filtering leaves 153,544 unique firm-year observations and 14,489 unique firms for the years 1963–2018. A firm is defined as a dividend payer if it has positive dividends per share in that fiscal year.[2] Gross repurchases are calculated as the total expenditure on the purchase of common and preferred stocks minus any reduction in the redemption value of the net number of preferred stocks outstanding.[3] A firm is defined as a repurchasing firm if its gross repurchases are positive for the given year. A firm has positive payout in a year if it is a dividend-paying and/or repurchasing firm. Additional details regarding the methods for data filtering and variable definitions are in the Internet Data Appendix.

2.1. Disappearing and reappearing dividends

Despite numerous papers showing that dividends are sticky (e.g., Lintner, 1956; Brav et al., 2005), we observe marked changes in aggregate dividend policy over the past five decades. Fig. 1a depicts the number of dividend-paying firms, repurchasing firms, and firms with positive payout by year. Fig. 1b depicts the corresponding percentages. The proportion of firms paying dividends trends downward from 72.7% in 1978 to 23.4% in 2000. This phenomenon has been widely reported, notably in Fama and French (2001). The figure shows that the prevailing trend reverses around 2000, and dividends begin to reappear. By 2018, the prevalence of dividend-paying firms partially recovers from 23.4% to 36.0%.

One driver of the initial disappearing-dividends phenomenon is the increasing number of new lists (Fama and French, 2001), which significantly increases the total number of firms in the sample from 2697 in 1978 to a peak of 4448 in 1997. Fig. 1a illustrates the increase in the number of listed firms and the concurrent decrease in the number of dividend-paying firms during this period. Almost none of these newly listed firms pay dividends, leading to a decrease in the percentage of dividend-paying firms. Table 1, columns 1–3, shows the number of dividend payers each year, as well as the number of dividend initiations (first-time payers) and terminations (last-time payers). Only a handful of dividend initiations occur in the sample in each year. In fact, the number of dividend payers decreases to less than half over this period, from 1960 in 1978 to 870 in 2000. Fig. 2 and Table 1 present the reasons as coded by CRSP for these dividend terminations. Dividend-paying firms rarely decide to stop paying (column 4). Instead, most of the reduction in dividend payers results from firms delisting, and most of this delisting is due to mergers (columns 5 and 6).

A different trend emerges after 2000: the percentage of dividend-paying firms begins to increase (Fig. 1b). Interestingly, this change is not driven by additional firms paying dividends. As seen in Table 1, the number of new dividend payers remains low after 2000, averaging fewer than nine per year, and the number of dividend-paying firms plateaus at around 820. Instead, the reappearing phenomenon is driven primarily by the delisting of non-dividend-paying firms. The number of listed firms begins to decrease after 1997 and reaches a local minimum of 2168 in 2017. As Fig. 1a shows, the number of total firms declines more steeply than the number of dividend-paying firms. Further analysis in Section 4.3 reveals that non-dividend-paying firms delist at a higher rate than dividend-paying firms and thus drive the reappearance.

3. Firm characteristics and the proclivity to pay dividends

Firms decision to pay dividends may change either because the firms have different characteristics or a different threshold at which they pay dividends. For example, dividend-paying firms can decide not to pay dividends because their profits are negative, a change in characteristics compared to firms listed earlier. Alternately, firms can choose to not pay despite being as profitable as previous dividend payers. That is, the threshold for paying dividends can change. We label this second reason a change in the proclivity to pay dividends. In Section 3.1, we estimate a baseline regression to test whether the proclivity to

[2] This measure of gross dividends is the standard dividend definition used in the literature. Moreover, according to survey evidence [e.g., Brav et al., 2005], this definition is consistent with how management considers dividends.

[3] The reduction in the redemption value of the net number of preferred stocks outstanding is calculated by subtracting the value of preferred stock repurchased from the value of total stock repurchased to get the value of the common stock repurchased (see also Grullon and Michaely, 2002).

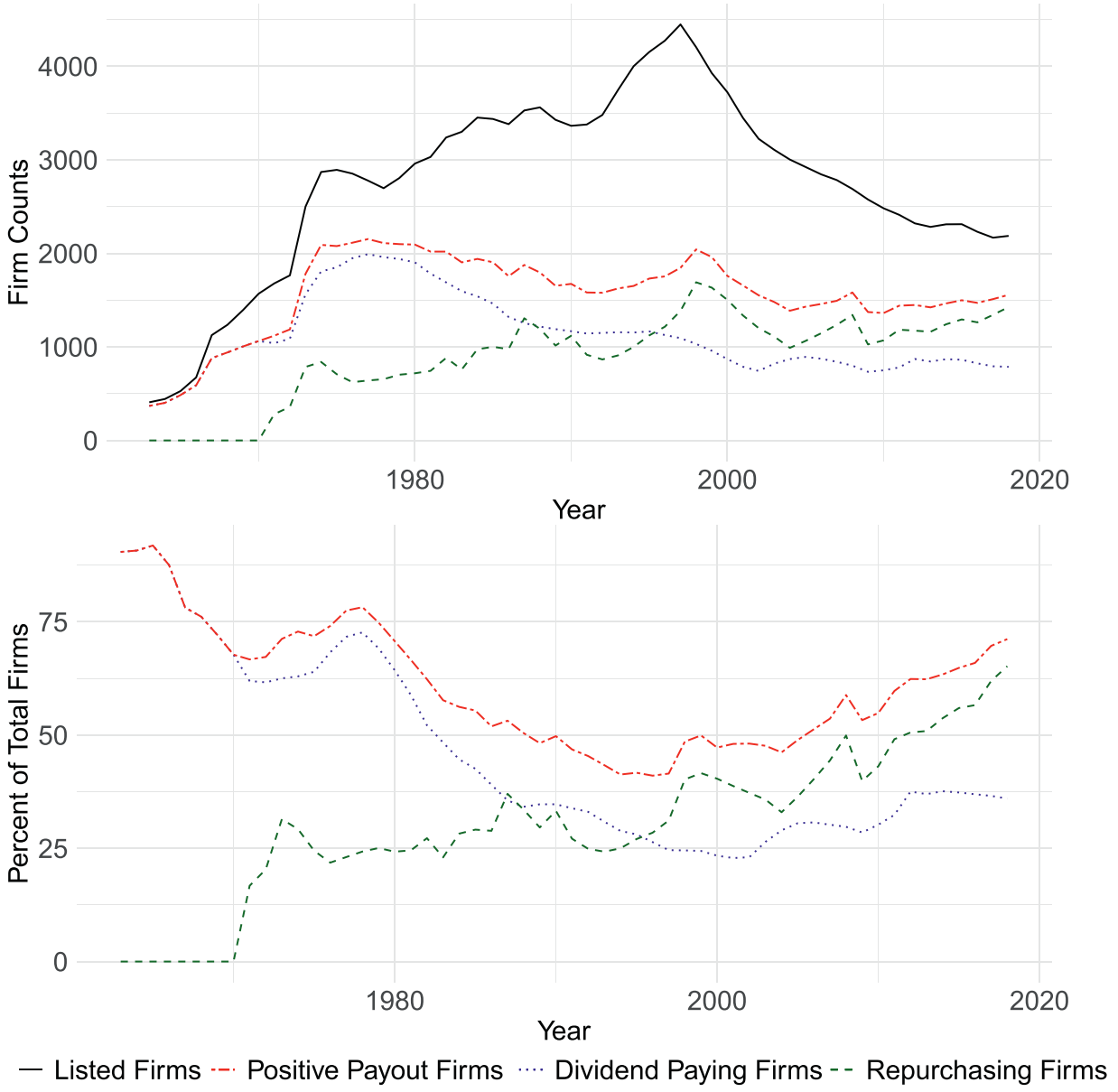

Fig. 1. Payout trends. Fig. 1a shows overall firm counts for the years in our sample as well as the number of dividend payers, repurchasing firms, and firms with positive payout. Fig. 1b shows the percentage of firms that are dividend payers, repurchasing firms, or have positive payout in each year. For further details on sample construction and variable definitions, see the Internet Data Appendix.

pay dividends is changing over time. In Section 3.2, we consider how distributions of characteristics that are known to be related to the decision to pay dividends change over time, and how changing characteristics impact the fraction of dividend-paying firms. In Section 3.3, we explore how the relation between the fundamental characteristics in the logit model and the decision to pay dividends changes over time. Specifically, we test how much of the disappearing-and reappearing-dividends trends is attributable to the changing proclivity to pay dividends. We also examine the role of earnings volatility, a factor omitted from the original model, in the estimated proclivity to pay dividends. Section 3.4 investigates whether firms that drive changes in characteristics also drive changes in the proclivity to pay dividends.

3.1. Changing proclivity to pay dividends

Like Fama and French (2001), we estimate logistic regressions of a firms probability of paying dividends given its profitability, size, and investment opportunities. We also include earnings volatility in our regressions because studies show it to be an important determinant of dividend policy (Brav et al., 2005; Michaely et al., 2021). The coefficients from the logistic regressions are first estimated using the 1967–1977 data. We then use these coefficients

Table 1
Dividend-payer entry and exit.
We tabulate the number of firms with positive dividends (dividend payers, column 1) in the sample in each year, as well as the number of first-time dividend payers (new payers, column 2) and last-time dividend payers (dividend terminations, column 3). Dividend terminations are considered not due to delisting (column 4) if the firm paid dividends in that year but does not pay in any future years, despite remaining listed. Dividend terminations are labelled as due to delisting (column 5) if the firm paid dividends in the last year they were in the sample. Firms that have a CRSP delist code from 200 to 399 are categorized as "Dividend termination due to M&A delist" (column 6). Percentages relative to the total number of dividend-paying firms in that year are reported in parentheses. More details on sample selection and variable definitions are in the Internet Data Appendix.

	(1)	(2)	(3)	(4)	(5)	(6)
Year	Dividend payers	New payers	Dividend terminations	Dividend terminations not due to delisting	Dividend terminations due to Delisting	Dividend terminations due to M&A Delist
1978	1960	27 (1.4)	135 (6.9)	29 (1.5)	106 (5.4)	98 (5.0)
1979	1940	45 (2.3)	140 (7.2)	40 (2.0)	100 (5.2)	90 (4.6)
1980	1904	28 (1.5)	164 (8.6)	63 (3.3)	101 (5.3)	86 (4.5)
1981	1784	16 (0.9)	136 (7.6)	46 (2.6)	90 (5.0)	77 (4.3)
1982	1690	25 (1.5)	135 (8.0)	60 (3.6)	75 (4.4)	67 (4.0)
1983	1596	17 (1.1)	139 (8.7)	30 (1.9)	109 (6.8)	97 (6.1)
1984	1541	24 (1.6)	150 (9.7)	42 (2.7)	108 (7.0)	100 (6.5)
1985	1463	24 (1.6)	170 (11.6)	51 (3.5)	119 (8.1)	108 (7.4)
1986	1320	13 (1.0)	136 (10.3)	56 (4.2)	80 (6.1)	75 (5.7)
1987	1255	27 (2.2)	137 (10.9)	49 (3.9)	88 (7.0)	81 (6.5)
1988	1217	27 (2.2)	103 (8.5)	35 (2.9)	68 (5.6)	57 (4.7)
1989	1190	8 (0.7)	89 (7.5)	48 (4.1)	41 (3.4)	36 (3.0)
1990	1168	14 (1.2)	76 (6.5)	50 (4.3)	26 (2.2)	17 (1.5)
1991	1143	14 (1.2)	50 (4.4)	36 (3.2)	14 (1.2)	11 (1.0)
1992	1150	7 (0.6)	60 (5.2)	36 (3.1)	24 (2.1)	20 (1.7)
1993	1157	18 (1.6)	68 (5.9)	39 (3.4)	29 (2.5)	24 (2.1)
1994	1154	28 (2.4)	67 (5.8)	21 (1.8)	46 (4.0)	42 (3.6)
1995	1166	24 (2.1)	78 (6.7)	37 (3.2)	41 (3.5)	39 (3.3)
1996	1127	12 (1.1)	99 (8.8)	37 (3.3)	62 (5.5)	60 (5.3)
1997	1094	22 (2.0)	104 (9.5)	27 (2.5)	77 (7.0)	67 (6.1)
1998	1032	13 (1.3)	100 (9.7)	26 (2.5)	74 (7.2)	69 (6.7)
1999	959	13 (1.4)	113 (11.8)	35 (3.7)	78 (8.1)	65 (6.8)
2000	870	9 (1.0)	87 (10.0)	31 (3.6)	56 (6.4)	43 (4.9)
2001	788	2 (0.3)	53 (6.7)	28 (3.5)	25 (3.2)	16 (2.0)
2002	743	5 (0.7)	25 (3.4)	7 (1.0)	18 (2.4)	13 (1.7)
2003	821	5 (0.6)	39 (4.8)	11 (1.4)	28 (3.4)	18 (2.2)
2004	870	2 (0.2)	54 (6.2)	10 (1.1)	44 (5.1)	34 (3.9)
2005	893	15 (1.7)	70 (7.8)	22 (2.4)	48 (5.4)	42 (4.7)
2006	874	10 (1.1)	91 (10.4)	21 (2.4)	70 (8.0)	64 (7.3)
2007	841	14 (1.7)	63 (7.5)	36 (4.3)	27 (3.2)	18 (2.1)
2008	800	7 (0.9)	67 (8.4)	49 (6.1)	18 (2.3)	14 (1.8)
2009	734	10 (1.4)	44 (6.0)	17 (2.3)	27 (3.7)	25 (3.4)
2010	750	3 (0.4)	42 (5.6)	14 (1.9)	28 (3.7)	20 (2.7)
2011	781	9 (1.2)	38 (4.9)	16 (2.1)	22 (2.8)	17 (2.2)
2012	871	9 (1.0)	70 (8.0)	37 (4.2)	33 (3.8)	30 (3.4)
2013	844	9 (1.1)	49 (5.8)	26 (3.1)	23 (2.7)	19 (2.3)
2014	869	12 (1.4)	65 (7.5)	20(2.3)	45 (5.2)	29 (3.3)
2015	863	14 (1.6)	78 (9.0)	25 (2.9)	53 (6.1)	35 (4.1)
2016	824	9 (1.1)	72 (8.7)	21 (2.5)	51 (6.2)	36 (4.4)
2017	793	11 (1.4)	62 (7.8)	23 (2.9)	39 (4.9)	23 (2.9)
2018	787	13 (1.7)	29(3.7)	21(2.7)	8(1.0)	6 (0.8)

to project the portion of firms that would have paid dividends from 1978 to 2018 (assuming the same proclivity to pay dividends as a firm from 1967 to 1977).[4]

Our dependent variable is $P_{divpay,it}$, a dummy for whether firm i pays dividends in year t. Firm profitability is calculated as E_{it}/A_{it}, the ratio of the firms earnings before interest to assets. We proxy for earnings volatility using $(\frac{dE_{it}}{(A_{it}+A_{it-1})/2})^2$, the change in earnings scaled by average assets, squared. For our size proxy (NYP_{it}), we use the percentile of the firms market capitalization relative to NYSE firms.[5] Finally, we proxy for investment opportunities using Tobins Q and asset growth. Tobins Q is calculated as V_{it}/A_{it}, the market value of the firm over the book value, whereas asset growth is calculated as $\frac{dA_{it}}{(A_{it}+A_{it-1})/2}$, the firms

[4] We use the data from 1967 to 1977 instead of starting in 1963, because we find that before 1967, the CRSP/Compustat merged sample is not representative of the population of CRSP firms. Larger, more profitable firms are more likely to be matched, and smaller firms have poor coverage. To avoid biasing our regression, we omit the years 1963–1966. However, our results are not materially different when we include data from 1963 to 1966.

[5] We also use inflation-adjusted market cap and find similar results.

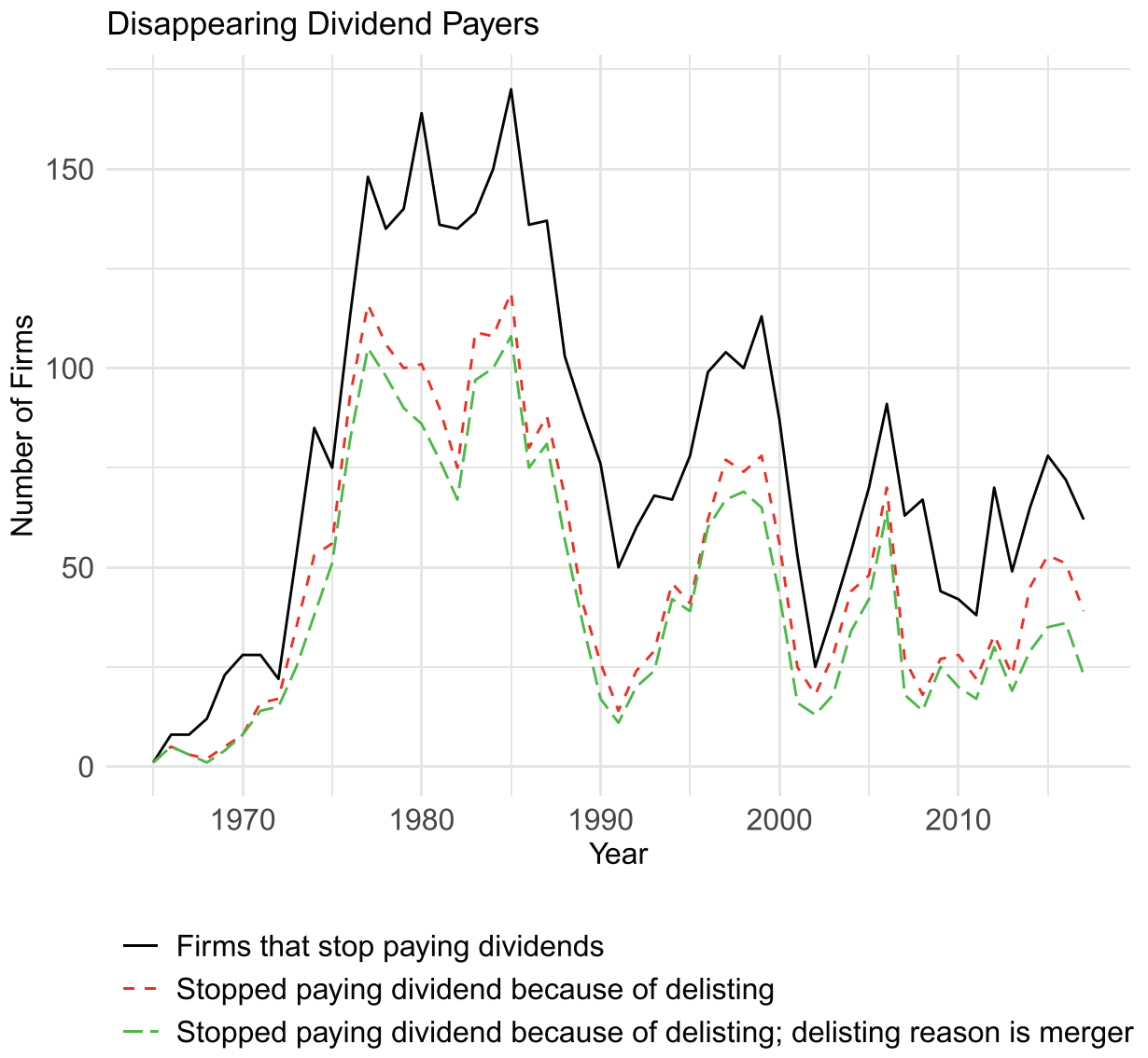

Fig. 2. Dividend termination, delisting, and mergers. This figure shows the number of dividend terminations in each year. Dividend terminations are categorized as due to delisting if the firm paid dividends in the last year they are in the sample. Dividend terminations are counted as due to M&A if the firm paid dividends in the last year they are in the sample and they have a CRSP delist code between 200 and 399. Additional details on sample composition and variable definitions are in the Internet Data Appendix.

change in assets over the last year scaled by average assets.[6]

We estimate Eq. (1) as follows:

$$log(\frac{P_{divpay,it}}{1-P_{divpay,it}}) = \beta_0 + \beta_1 * \frac{E_{it}}{A_{it}} + \beta_2 * \left(\frac{dE_{it}}{(A_{it}+A_{it-1})/2}\right)^2 + \beta_3 * NYP_{it} + \beta_4 * \frac{V_{it}}{A_{it}} + \beta_5 * \frac{dA_{it}}{(A_{it}+A_{it-1})/2} + \epsilon_{it} \quad (1)$$

[6] We estimate additional specifications, omitting Tobins Q and earnings volatility. These results can be found in the Internet Appendix (Table IA1). Additional details on data and variable definitions are included in the Internet Data Appendix.

Following Fama and MacBeth (1973), we estimate a separate regression for each year and average coefficients over the years 1967–1977. We present logistic regression coefficients estimated for the years 1967–1977 in Table 2, column 1, with *t*-statistics calculated as per Fama and MacBeth (1973). We use these coefficient estimates to project the expected percentage of dividend payers each year.

All coefficients have *t*-statistics greater than two in magnitude. Coefficients on profitability and size are both greater than zero, whereas coefficients on proxies for investment opportunities are negative. These findings are consistent with those in Grullon et al. (2002) and DeAngelo et al. (2006), based on the maturity hypothesis of dividends: larger, more profitable firms with fewer investment opportunities are more likely to pay dividends.

Table 2
Projecting dividend payer vs. nonpayer: coefficients from logistic regressions.
Similar to the model in Fama and French (2001), we estimate Fama and MacBeth (1973) regressions of whether or not a firm pays dividends on profitability, earnings volatility, NYSE percentile, Tobin's Q, and asset growth for each year (column 1). Column 2 is the same as column 1 but with lagged dividend payer status as an additional regressor. Column 3 is the same as column 1 but with whether a firm has positive payout as the dependent variable; positive payout firms are defined as those with positive dividends and/or repurchases. Coefficients were obtained by averaging annual values for the years 1967–1977. We calculate t-statistics for the coefficients (in parentheses) as the average coefficient divided by its standard error (the times-series standard deviation of the regression coefficient divided by the square root of the number of years in the period). Details on sample selection and variable definitions are in the Internet Data Appendix.

	Dependent variable		
	Dividend payer	Dividend payer	Positive payout
Constant	−0.11	−3.55	0.24
	(−0.74)	(−14.28)	(1.55)
Profitability	15.56	21.48	14.38
	(9.19)	(7.68)	(7.55)
Earnings Volatility	−43.91	−5.15	−35.32
	(−3.36)	(−0.17)	(−2.80)
NYSE Percentile	0.04	0.02	0.04
	(23.41)	(10.16)	(32.21)
Tobin's Q	−0.86	−0.69	−0.80
	(−7.66)	(−7.37)	(−7.57)
Asset Growth	−0.71	0.95	−0.79
	(−2.70)	(2.30)	(−3.32)
Dividend Payer in Year $t-1$		6.29	
		(24.40)	

Finally, the coefficient on earnings volatility is negative, consistent with the claim that firms with high earnings volatility could be reluctant to commit to paying dividends (Lintner, 1956; Michaely et al., 2021).

The most economically significant variables appear to be profitability, earnings volatility, and size. Using the standard deviations from 1978 reported in Table 4, Panel A, we calculate odds ratios as $exp(\beta * st.dev)$. We find that a one standard deviation increase in profitability leads to a 2.8 times probability of paying dividends. A one standard deviation increase in earnings volatility leads to an 11.4 times probability of paying dividends. Finally, a one standard deviation increase in size leads to a 3.1 times probability of paying dividends.

We use the estimated coefficients to project the probability that each firm-year observation will pay dividends. The expected percentage of dividend payers for a given year is the sum of the firms projected payout propensities divided by the total number of firm observations; this value is equivalent to the average expected probability of paying dividends for firms in the sample that year.[7] We interpret the expected percentage of payers as the portion of firms expected to pay dividends if the proclivity to pay dividends had not changed relative to that of 1967–1977. We subtract the expected percentage of dividend payers from the actual percentage to calculate the prediction error. This error term can be viewed as the proportion of firms that, although expected to pay dividends in 1967–1977, do not pay. As discussed, both the propensity to pay dividends and the prediction errors are model specific. For example, not accounting for earnings volatility results in a higher expected fraction of dividend payers, and consequently a larger change in the proclivity to pay dividends.

Fig. 3 and Table 3 show the actual (column 3) and expected (column 4) percentage of dividend-paying firms, as well as the difference between the two (column 5). Five-year averages of annual values are presented for concision, with *t*-statistics presented in parentheses below; we apply a Newey–West standard error adjustment when calculating t-statistics. This discrepancy widens until 2002, at which point it reaches a trough of −21.7 pp. In absolute numbers, 3225 listed firms appear in our sample for the year 2002; therefore, we would expect 21.7%*3,225 = 700 more dividend payers than the number observed. Subsequently, the gap between actual and expected dividend payers narrows after 2002, with a net 10.6-pp change from -21.7 pp in 2002 to −11.1 pp in 2018. Of the 2187 listed firms in the sample in 2018, 243 are expected to pay dividends but do not pay.[8]

Overall, we show the expected fraction of dividend payers has exceeded the actual number every year since 1978, indicating a persistent aggregate change in the proclivity to pay dividends. We find an increase in the magnitude of the gap between actual and expected dividend payers from 1978 to 2000, and a subsequent decrease from 2000 to 2018. We quantify the impact of the changing proclivity to pay dividends on the overall dividend disappearance and reappearance in Section 3.3.

3.2. Changing firm characteristics

Next, we examine the extent to which changes in firm characteristics affect the dynamics of aggregate dividend policy. We calculate the mean, standard deviation, median, and 5th and 95th percentiles for several firm characteristics, namely, profitability, earnings volatility, NYSE percentile, Tobins Q, and asset growth for each year (variable definitions are in the Internet Data Appendix). We report these values for 1978, 2000, and 2018 in Table 4, Panels A through C, respectively.

We highlight the role of two particularly impactful variables: profitability and earnings volatility. First, firms with negative profitability constitute less than 5% of the sample in 1978, but are so common by 2000 that the average profitability decreases from 0.0905 (in 1978) to -0.0545 (in 2000). The cross-sectional standard deviation of profitability also increases from 0.0667 in 1978 to 0.3849 in 2000. The increased presence of negative-profitability firms and the lower average profitability do not reverse during the

[7] Results are qualitatively similar if we instead calculate our expected percentage by taking all the firms with projected $P_{divpay,it} \geq 0.5$ divided by the total number of firms.

[8] When we omit earnings volatility from the regression, as in the original Fama and French (2001) analysis, the same trend in expected dividend payers holds (Internet Appendix Table IA2). However, the prediction accuracy is considerably reduced. The maximum difference between the actual and expected percentage of firms that pay dividends is 3.5 pp larger when we exclude earnings volatility from our regression. This gap then declines until it reaches -12.9 pp in 2018, as opposed to -11.1 pp with earnings volatility included.

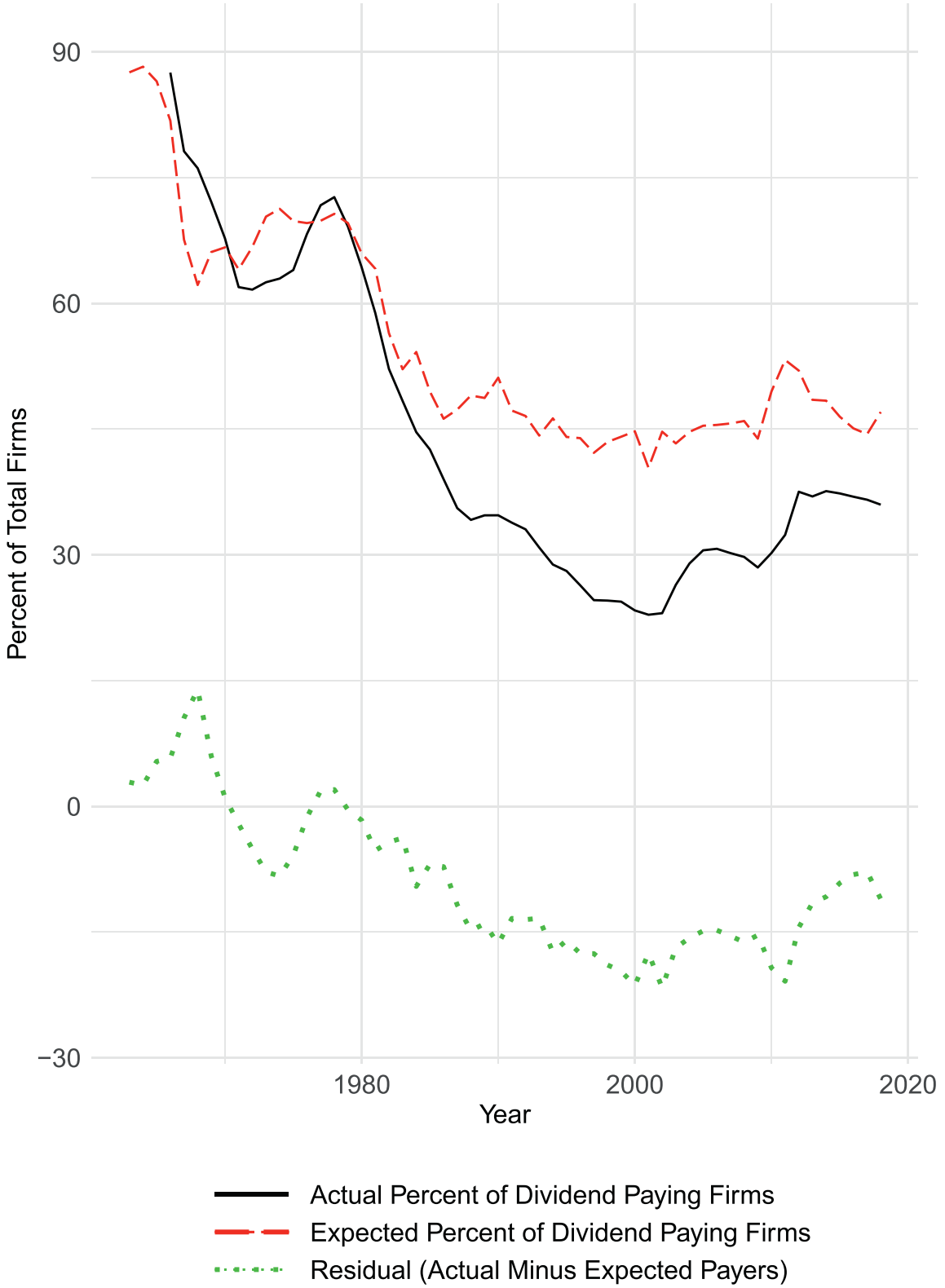

Fig. 3. Actual vs. projected dividend payers. This figure shows the percentage of actual and expected dividend payers in each year, along with the difference between them (details of sample construction and variable definitions are in the Internet Data Appendix). The expected percentage of dividend payers is computed as in Table 3.

Table 3
Actual vs. expected dividend payers.
We tabulate the number of firms in the sample (column 1), the number of dividends payers (column 2), the percentage of total firms that are dividend payers (column 3), the expected percentage of dividend payers (column 4), and the actual minus expected percentage of dividend payers (column 5). We project the probability that each firm-year observation will pay dividends using the coefficients from Table 2, column 1, and then average these probabilities across all firms in each year to obtain the aggregate expected percentage of dividend payers. Panel A presents averages of annual values for roughly five-year intervals, with t-statistics for the residual presented in parentheses (standard errors are calculated as per Newey and West, 1994). Panel B presents annual values for pivotal years discussed in the paper. More details on sample selection and variable definitions are in the Internet Data Appendix.

	(1)	(2)	(3)	(4)	(5)
Panel A: Five year averages					
Years	Number of firms	Number of payers	Percentage of payers	Expected percentage of payers	Actual minus expected percentage
1963–1965	460	419	91.0	87.4	3.6
					(2.88)
1966–1970	1200	896	76.3	68.9	7.5
					(2.90)
1971–1975	2341	1470	62.6	68.5	−5.8
					(−6.13)
1976–1980	2819	1949	69.2	69.1	0.1
					(0.12)
1981–1985	3292	1615	49.3	55.3	−6.0
					(−6.30)
1986–1990	3453	1230	35.6	48.5	−12.8
					(−11.55)
1991–1995	3752	1154	30.9	45.7	−14.7
					(−16.51)
1996–2000	4116	1016	24.7	43.7	−19.0
					(−7.31)
2001–2005	3141	823	26.4	43.7	−17.3
					(−13.84)
2006–2010	2675	800	29.9	46.1	−16.2
					(−40.39)
2011–2015	2328	846	36.4	49.7	−13.4
					(−7.58)
2016–2018	2195	801	36.5	45.5	−9.0
					(−57.43)
Panel B: Selected years					
Years	Number of firms	Number of payers	Percentage of payers	Expected percentage of payers	Actual minus expected percentage
1978	2697	1960	72.7	70.7	2.0
1997	4448	1094	24.6	42.2	−17.6
2000	3723	870	23.4	44.7	−21.4
2002	3225	743	23.0	44.7	−21.7
2017	2168	793	36.6	44.4	−7.8
2018	2187	787	36.0	47.0	−11.1

reappearing-dividends period. Rather, the average, median, 5th percentile, and 95th percentile all decrease slightly further.

Second, the average earnings volatility increases over 18-fold from 1978 to 2000 (0.0053 compared to 0.0981). Over the same period, the cross-sectional standard deviation of earnings volatility increases substantially, from 0.0554 in 1978 to 1.3364 in 2000. However, in this case, the higher dispersion is due to an increasing proportion of very-high-earnings-volatility firms, resulting in a 14-fold increase in the 95th percentile of average earnings volatility (0.0123 in 1978 vs. 0.1764 in 2000). During the reappearing-dividends period, the average earnings volatility is nearly halved (from 0.0981 in 1978 to 0.0575 in 2018). Although the 95th percentile of earnings volatility also decreases, it remains much higher than it was in 1978. This finding is consistent with our prior observation that although dividends do reappear from 2000 onward, they do not fully recover to their 1978 levels.

We next construct a heuristic measure of the impact of these changes in characteristics on the probability a firm pays dividends. Using the coefficients from Eq. (1) (Table 2, column 1), we calculate the probability of paying dividends for a firm with average characteristics from 1978. We then compare this value with the probability of the same firm paying dividends with the lower average profitability from 2000. Our hypothetical firm with the lower profitability would be 51.11 pp less likely to pay dividends (Table 4, Panel D, column 1). Likewise, if a firm had the sample-average characteristics from 2000 and its profitability decreased to the average seen in 2018, its probability of paying dividends would decrease by an additional 0.07 pp. Thus, the trend in profitability since 2000 runs counter to dividends reappearing.

Table 4
Firm characteristics and impact of change on expected dividends.
Summary statistics (mean, standard deviation, 5th, 50th, and 95th percentiles) for the characteristics included in our analysis (profitability, earnings volatility, NYSE percentile, Tobin's Q, and asset growth) for the years 1978, 2000, and 2018 are presented in Panels A through C, respectively. Panel D shows how the expected probability of paying dividends (calculated using the coefficients from Table 2, column 1) would change if a firm with average characteristics from 1978 had each characteristic separately changed to the average value from 2000. We repeat this exercise for a firm with average characteristics from 2000 with each characteristic separately changed to the average value from 2018. Additional details on sample selection and variable definitions are in the Internet Data Appendix.

	(1)	(2)	(3)	(4)	(5)
Panel A: 1978					
Statistic	Profitability	Earnings volatility	NYSE percentile	Tobin's Q	Asset growth
Mean	0.0905	0.0053	25.5584	1.1253	0.1489
St. Dev	0.0667	0.0554	28.5643	0.8417	0.1837
5th Percentile	0.0094	0.00001	0.6847	0.6625	−0.0839
Median	0.0948	0.0007	11.9748	0.9583	0.1312
95th Percentile	0.1655	0.0123	87.3671	2.0073	0.4537
Panel B: 2000					
Statistic	Profitability	Earnings volatility	NYSE percentile	Tobin's Q	Asset growth
Mean	−0.0545	0.0981	25.9300	1.9930	0.1370
St. Dev	0.3849	1.3364	28.0188	2.4771	0.4002
5th Percentile	−0.5913	0.00001	0.5888	0.6268	−0.3586
Median	0.0484	0.0024	13.4488	1.213	0.0616
95th Percentile	0.1743	0.1764	86.2015	6.1289	0.9788
Panel C: 2018					
Statistic	Profitability	Earnings volatility	NYSE percentile	Tobin's Q	Asset growth
Mean	−0.0757	0.0575	32.7264	2.0677	0.0669
St.Dev	0.3910	0.5951	30.2616	1.7261	0.3198
5th Percentile	−0.7206	0.00001	0.4055	0.7486	−0.3707
Median	0.0392	0.0013	23.8433	1.4834	0.0279
95th Percentile	0.1669	0.1335	90.8541	5.4062	0.6298
Panel D: Change in probability of paying dividends					
	Profitability	Earnings volatility	NYSE percentile	Tobin's Q	Asset growth
Change in probability due to characteristic from 1978 to 2000	−51.11	−70.53	0.30	−16.12	0.15
Change in probability due to characteristic from 2000 to 2018	−0.07	1.30	0.09	−0.02	0.01

We find that a firm with the sample-average earnings volatility from 2000, but other sample-average characteristics from 1978 would be 70.53 pp less likely to pay dividends than a firm with all sample-average characteristics from 1978 (Table 4, Panel D, column 2). A firm with the lower sample-average earnings volatility from 2018 but other sample-average characteristics from 2000 would be 1.30 pp more likely to pay dividends.[9]

Overall, we find that: (i) earnings volatility has the largest impact of all relevant characteristics during the disappearing-dividends period, (ii) profitability contributes significantly to the dividend disappearance, (iii) the impact of these characteristics stems from both the large changes in the value of these characteristics as well as the magnitude of the coefficients in our estimated regression, and (iv) decreasing earnings volatility is the only characteristic that contributes materially to the reappearing-dividends phenomenon. Trends in profitability and Tobins Q run counter to dividends reappearing, and asset growth predicts a statistically insignificant increase in dividend payers.

3.3. Relative impact of changing characteristics vs. changing proclivity to pay dividends

We now calculate how much of the disappearing and reappearing dividends can be attributed to changing characteristics vs. changing proclivity to pay dividends. Changes in the expected percentage of dividend payers are attributable to changes in firm characteristics. Because low-profitability firms generally do not pay dividends, we expect the percentage of dividend-paying firms to decrease when we observe a large influx of low-profitability firms. Our analysis in Section 3.1 confirms this conjecture and finds a large, positive coefficient on profitability. However, the total decrease in the percentage of dividend payers

[9] Note these calculations are for a single hypothetical firm. Due to the nonlinearity of the logit function, and the skewness of the distribution of firm characteristics, the 51 pp (profitability) and 71 pp (earnings volatility) drops are larger than the total expected change in dividends for the full sample.

from 1978 to 2000 is larger than the expected decrease. We attribute the unexpected portion of the decrease to changing proclivity. Decreases in the proclivity to pay dividends capture the behavior of nonpaying firms that have characteristics similar to those of pre-1978 dividend payers. We use the following structure to decompose the total change in dividend payers into the components resulting from changes in firm characteristics vs. changes in proclivity:

$$TotalChange = ChangeFromCharacteristics + ChangeFromProclivity \quad (a)$$

$$ChangeFromCharacteristics = ExpectedChange \quad (b)$$

$$ChangeFromProclivity = ModelError \quad (c)$$

$$\frac{ChangeFromCharacteristics}{TotalChange} = \frac{ExpectedChange}{TotalChange} \quad (d)$$

$$\frac{ChangeFromProclivity}{TotalChange} = 1 - \frac{ExpectedChange}{TotalChange} \quad (e)$$

The total change is the sum of the change from each component phenomenon (Eq. (a)). The change in the expected fraction of dividend payers is defined in Eq. (b) as the change due to characteristics, and the residual is defined in Eq. (c) as the change from variation in dividend proclivity. Dividing Eqs. (b) and (c) by the total change in the fraction of dividend payers yields Eqs. (d) and (e), the fraction of the total change due to characteristics and the fraction of the total change due to changes in proclivity to pay dividends, respectively.

Using the relation above, we decompose the change in the percentage of dividend payers since 1978 (Table 5, Panel A) and since 2000 (Table 5, Panel B). For example, from 1978 to 2000, the portion of dividend-paying firms decreases by 49.31 pp (Table 5, Panel A, column 1). This decrease represents the total change and stems from changes in both firm characteristics and firms' proclivity to pay dividends. Over the same period, the expected prevalence of dividend payers decreases by 25.94 pp (Table 5, Panel A, column 2); this difference indicates that 25.94/49.31, or 52.62%, of the dividend disappearance can be explained by changing firm characteristics (Table 5 Panel A, column 4). The remaining 47.38% of disappearing dividends, the unexplained portion, is attributable to firms changing proclivity to pay dividends (Table 5, Panel A, column 5). Throughout the disappearing-dividends period of 1978–2000, the contribution from the changing characteristics and the contribution from the proclivity to pay dividends remain similar in magnitude and statistically significant.[10] For 2000–2018, the reappearing-dividends period, we find that 18.28% of the reappearing-dividends phenomenon is attributable to changing characteristics and 81.72% is due to the changing proclivity to pay dividends (Table 5, Panel B, columns 4 and 5).

[10] We use Fieller's method to calculate t-statistics for quotients.

To illustrate the importance of earnings volatility in the reappearing-dividends trend, we repeat our above analysis with earnings volatility omitted from the estimation. We find that the expected percentage of dividend-paying firms does not change significantly from 2000 to 2018 (Internet Appendix Table IA3), as opposed to a significant 2.31-pp increase when earnings volatility is included (Table 5, Panel B, column 2). These findings are consistent with our results from Table 4 which show earnings volatility to be the only characteristic that significantly contributes to dividends reappearing.

To summarize, we find that disappearing dividends can be attributed roughly equally to changing characteristics and changing proclivity. On the other hand, reappearing dividends are driven mostly by changing proclivity (81.72%) rather than changing characteristics (18.28%). The portion that is attributable to characteristics is mainly due to earnings volatility.

3.4. Are the firms that drive the changes in characteristics also responsible for the changes in proclivity?

Next, we study whether the same firms that are driving the changes in characteristics also contribute to changing proclivity. The evidence in Table 4 indicates that the two firm characteristics most relevant to payout decisions are profitability and earnings volatility; these same characteristics are also among the most economically significant in our logit model. We examine whether firms with low profitability and/or high earnings volatility also experience the largest change in the proclivity to pay dividends. These types of firms are also of interest because the pre-1978 sample that we use to calibrate our regression contains only a small number of the very low-profitability and very high-earnings-volatility firms common in the later years of our sample. Thus, we want to make sure that the types of firms that are underrepresented in our initial estimation are not driving the discrepancy between actual and expected dividend payers.

We analyze how proclivity changes both through time and in the cross section of profitability and earnings volatility. We sort all firm-year observations into four groups by profitability. First, we find the average 1st percentile of profitability for the years 1967–1977. Firms with profitability lower than this value were uncommon prior to the disappearing-dividends period (by construction); however, they constitute, on average, 15.5% of the sample from 1981 to 2018. We label these firms as having "very low" profitability. We then sort the remaining firm-year observations roughly into terciles ("low," "medium," and "high") with breakpoints at the average 34th and 67th percentiles of profitability in the years 1967–1977.[11] We then calculate the expected percentage of payers and prediction error for each bin for each year (using the coefficients estimated in

[11] We used the same absolute breakpoints to sort firms so that firms with similar profitability (or earnings volatility) in different years are grouped together; this design makes results easier to interpret. If we instead use relative breakpoints, a firm that would have been characterized as having "very low" profitability before 1978 could be in the medium profitability bin in 2000.

Table 5
Relative impact of changing firm characteristics vs. proclivity to pay dividends.
Panel A shows the total change in the portion of dividend-paying firms since 1978 (column 1), along with what percentage of that change can be attributed to changing firm characteristics (column 4) vs. changing proclivity to pay dividends (column 5). t-stats are reported in parentheses. The expected percentage of dividend-paying firms is calculated as in Table 3. The base year in Panel A is 1978, and the base year in Panel B is 2000. More details on sample selection and variable definitions are in the Internet Data Appendix.

	(1)	(2)	(3)	(4)	(5)
Panel A: Changes since 1978					
Year	Total change since 1978	Expected change (from characteristics)	Unexpected change (from proclivity)	percentage attributable to changing characteristics	percentage attributable to changing proclivity
1980	−8.35	−4.70	−3.65	56.32	43.68
	(−6.79)	(−6.99)	(−2.60)	(4.56)	(2.31)
1985	−30.11	−21.20	−8.91	70.41	29.59
	(−25.02)	(−29.52)	(−6.36)	(18.99)	(6.140
1990	−37.95	−19.55	−18.41	51.50	48.50
	(−31.96)	(−26.96)	(−13.23)	(20.55)	(12.20)
1995	−44.60	−26.61	−17.98	59.67	40.33
	(−40.33)	(−39.10)	(−13.85)	(28.02)	(13.08)
2000	−49.31	−25.94	−23.36	52.62	47.38
	(−44.68)	(−35.73)	(−17.69)	(27.87)	(16.43)
2005	−42.13	−25.28	−16.86	59.99	40.01
	(−34.84)	(−32.91)	(−11.77)	(23.87)	(11.13)
2010	−42.46	−21.19	−21.27	49.91	50.09
	(−33.71)	(−25.73)	(−14.13)	(20.41)	(13.01)
2015	−35.35	−24.20	−11.15	68.46	31.54
	(−26.73)	(−27.64)	(−7.03)	(19.14)	(6.78)
2018	−36.69	−23.64	−13.05	64.43	35.57
	(−27.42)	(−26.23)	(−8.09)	(18.88)	(7.74)
Panel B: Changes since 2000					
Year	Total change since 2000	Expected change (from characteristics)	Unexpected change (from proclivity)	percentage attributable to changing characteristics	percentage attributable to changing proclivity
2005	7.17	0.67	6.51	9.29	90.71
	(6.53)	(0.79)	(4.70)	(0.75)	(3.58)
2010	6.85	4.75	2.10	69.40	30.60
	(5.94)	(5.32)	(1.44)	(3.64)	(1.31)
2015	13.96	1.75	12.21	12.51	87.49
	(11.42)	(1.85)	(7.91)	(1.80)	(6.38)
2018	12.62	2.31	10.31	18.28	81.72
	(10.18)	(2.39)	(6.56)	(2.280)	(5.38)

Table 2, column 1). Five-year averages of the difference between the actual and the expected percentage of dividend payers for the "very low" and "high" profitability bins are presented in Table 6.[12]

Actual dividend payers in the "very low" profitability bin exceed expected payers in every year. Because "very low" profitability firms are slightly more likely to pay dividends than expected, they cannot be driving the gap between actual and expected dividend payers. Therefore, they also cannot be driving the aggregate decrease in the proclivity to pay dividends. Although actual dividend payers in the "high" profitability bin exceed the expected number in the 1960s, the proclivity to pay dividends declines through the 1980s and 1990s. The average gap between the actual and expected percentage of dividend payers among "high" profitability firms increases in magnitude until the gap reaches -29.6 pp in the 1996–2000 period.

An analogous procedure is applied to earnings volatility. We find the average 99th percentile of earnings volatility from 1967 to 1977. Firms with earnings volatility greater than this value, which constitute, on average, 10.4% of the sample from 1981 onward, are labelled "very high" earnings volatility. We split the remaining sample at the average 33rd and 66th percentiles from 1967 to 1977 into "low," "medium," and "high" earnings-volatility categories. The prediction errors for the "very high" and "low" volatility firms are reported in Table 6. Much like firms in the "very low" profitability bin, actual dividend payers slightly exceed expected payers in the "very high" earnings-volatility bin. By contrast, the proclivity to pay dividends for "low" earnings-volatility firms decreases significantly. The gap between actual and expected dividend payers declines from a high of 8.7 pp in the 1966–1970 period, before dividends disappear, to a low of -23.3 pp in the 1996–2000 period.

[12] We do not report values for the "very low" profitability and "very high" earnings-volatility bins before 1981 because, by design, our sample includes few of these firms in the earlier years. Our results do not materially change if we define "very low" profitability at the 2nd, 3rd, or 5th percentile, and define "very high" earnings at the 98th, 97th, or 95th percentile.

Table 6
Actual minus expected dividend payers: profitability and earnings volatility sample splits. We calculate the average 1st, 34th, and 67th percentile of profitability from 1967 to 1977 and sort all our firm-year observations into "very low," "low," "medium," and "high" profitability bins according to these breakpoints. We calculate the expected percentage of dividend-paying firms as described in Table 3 and present the actual minus expected percentage of dividend-paying firms in the "very low" and "high" profitability bins in columns 1 and 2 of Panel A (t-statistics in parentheses, Newey–West standard errors are calculated as per Newey and West (1994)). We also calculate the average 33rd, 66th, and 99th percentile of earnings volatility from 1967 to 1977 and use these breakpoints to sort firms into "low," "medium," "high," and "very high" earnings-volatility categories. The difference between actual and expected dividend payers for firms with "very high" and "low" earnings volatility are reported in columns 3 and 4, respectively. Panel B reports the average percentage of the sample in each bin from 1981 onward. More details on sample selection and variable definitions are in the Internet Data Appendix.

	(1)	(2)	(3)	(4)
Panel A: Five year averages				
	Actual minus expected percentage dividend payers			
Years	Very low profitability	High profitability	Very high earnings volatility	Low earnings volatility
1963–1965		5.6		3.7
		(2.98)		(2.38)
1966–1970		10.0		8.7
		(3.05)		(2.91)
1971–1975		−5.1		−1.7
		(−1.39)		(−2.47)
1976–1980		−2.6		3.4
		(−1.87)		(5.28)
1981–1985	4.0	−12.0	3.3	−4.0
	(2.91)	(−10.20)	(5.59)	(−7.36)
1986–1990	2.8	−21.3	1.7	−12.7
	(4.16)	(−12.21)	(3.21)	(−5.81)
1991–1995	2.9	−25.5	3.2	−16.5
	(8.39)	(−19.37)	(2.68)	(−15.99)
1996–2000	1.6	−29.6	0.6	−23.3
	(14.27)	(−16.34)	(1.17)	(−12.82)
2001–2005	1.3	−28.2	1.3	−21.3
	(3.85)	(−4.69)	(2.36)	(−5.89)
2006–2010	4.2	−26.3	5.4	−23.5
	(3.12)	(−16.85)	(3.95)	(−11.49)
2011–2015	3.3	−18.5	5.5	−18.4
	(3.31)	(−10.42)	(5.93)	(−14.06)
2016–2018	2.3	−9.3	3.6	−13.7
	(3.06)	(−3.80)	(2.14)	(−6.87)
Panel B: Relative presence in sample				
Average percentage of sample from 1981 onward	15.5	25.9	10.4	20.8

The evidence in Table 6 suggests that the firms that are driving the changes in the cross section of firm characteristics are not the same ones driving the changes in the proclivity to pay dividends. Changes in firm characteristics are attributable to very low-profitability and very high-earnings-volatility firms; these firms would not be expected to pay dividends and verifiably do not pay. Rather, the change in the proclivity to pay dividends is attributed to high-profitability and low-earnings-volatility firms that choose not to pay dividends.

4. Model specification and changing market structure

In this section, we consider how other factors, such as firm characteristics omitted from the model or changes in the environment, affect the fraction of dividend-paying firms.

First, the empirical specifications in both Fama and French (2001) and the main specification of this paper do not include past dividend status as one of the explanatory variables. The reason is that we want to quantify which characteristics are typical of firms that choose to pay dividends in the first place, and the inclusion of lagged dividends obscures these relations. Nevertheless, we include firms lagged dividend payer status in our model and show that, for firms that pay dividends (and continue to be publicly traded), the observed changes in dividend policy can be reconciled with Lintner (1956). Second, we test for a potential generation gap (another factor possibly omitted from our original empirical model), by splitting our sample by IPO timing. Third, we examine how changes in the regulatory structure affect firms dividend policy. Specifically, we analyze the impact of the passage of SEC rule 10b-18 and the resulting use of open market share repurchases on payout proclivity. Finally, we also examine whether the dividend reappearance is attributable to other changes in market structures, such as the tech bubble bursting and the general decrease in the number of listed firms after 2000.

4.1. Within-firm changes or generation gap?

Dividend stickiness (Lintner, 1956) suggests that firms that pay dividends will continue to do so, barring extreme circumstances. In this light, it would be surprising if the decrease in the proclivity to pay dividends was driven by dividend payers omitting their dividends. Indeed, Table 1 and Fig. 2 show that few firms stop paying dividends. Of the dividend terminations that do occur, a majority are due to firms delisting rather than deciding to omit current dividends. We estimate Eq. (2) to confirm the continued importance of dividend persistence. Eq. (2) is the same as Eq. (1) but with a dummy for whether the firm paid dividends in the previous year ($DivPay_{it-1}$). Including this additional regressor allows us to assess the predictive power of firms' past dividend payer status on whether they currently pay dividends.

$$log\left(\frac{P_{divpay,it}}{1-P_{divpay,it}}\right) = \beta_0 + \beta_1 * \frac{E_{it}}{A_{it}} + \beta_2 * \left(\frac{dE_{it}}{(A_{it}+A_{it-1})/2}\right)^2 + \beta_3 * NYP_{it} + \beta_4 * \frac{V_{it}}{A_{it}} + \beta_5 * \frac{dA_{it}}{(A_{it}+A_{it-1})/2} + \beta_6 * DivPay_{it-1} + \epsilon_{it} \quad (2)$$

Our estimates (reported in Table 2, column 2) are consistent with continued persistence of dividend policy. The coefficient on whether a firm paid dividends in the previous year is positive and statistically significant at the 99.9% level. Most notably, the prediction accuracy is improved when lagged dividend payer status is included. To show

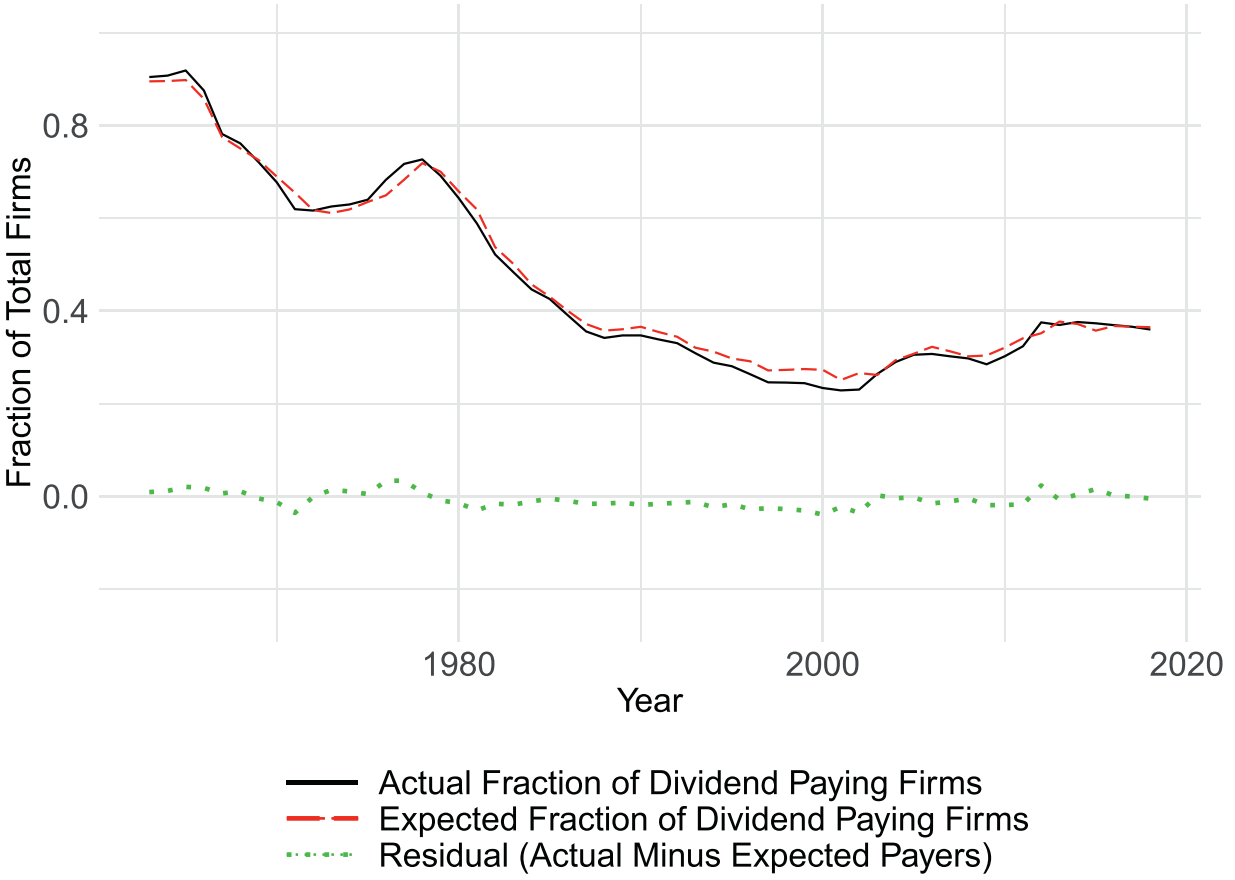

Fig. 4. Actual vs. projected dividend payers: the role of dividend persistence. This figure shows the percentage of actual and expected dividend payers in each year, along with the difference between them (details of sample construction and variable definitions are in the Internet Data Appendix). The expected percentage of dividend payers is computed using the same procedure as Table 3, but with a dummy for whether the firm paid dividends in the previous year included in the logit model.

the improvement, we recreate Fig. 3, but using Eq. (2) to estimate the projected fraction of dividend payers. We plot the actual fraction of dividend-paying firms, the expected fraction of dividend payers (where the expected fraction is calculated using the fitted values from Eq. (2)), and the difference in Fig. 4.[13] The average regression error is indistinguishable from zero and does not show any apparent trend, not even after 1978. Whether a firm paid dividends in the previous year remains the best predictor of whether a firm will continue to pay dividends. What appears to change is whether firms decide to start paying dividends in the first place.

The continued persistence of dividends suggests changes in sample composition, rather than within-firm changes, drive the observed dividend trends. To directly test whether newer firms are driving dividend trends (rather than already listed firms changing their dividend policy), we compare the firms that went public before 1978 with the firms that went public in 1978 or later. The actual percentage of dividend payers and the difference between the actual and expected dividend payers for these subsamples are reported in Table 7. The actual and expected prevalence of dividend payers for older firms averages 69.3% from 1978 onward and exhibits no systemic trends. The absence of disappearing or reappearing dividends in these samples supports the hypothesis that most changes in dividend policy derive from firms that enter and/or exit the sample.

We find that firms that went public in 1978 or later (Table 7, column 6) have a systemically lower percentage of actual dividend payers (19.5%) than firms with earlier IPOs. On average, these newer firms have a statistically significant 19.4 pp more expected dividend payers than actual payers. Because this subset of firms is less likely to pay dividends (compared with firms with IPOs before 1978), their increased presence decreases the aggregate percentage of dividend-paying firms. Moreover, the subsample of firms with IPOs in 1978 or later demonstrates the same dividend trends as the aggregate sample: decreasing from 1978 to 2000 and increasing thereafter.

These results show that a “generation gap” does exist. Firms with later IPOs appear to have a persistently lower proclivity to pay dividends. As we found in Section 3.4,

[13] This information is also presented in tabular form in Internet Appendix Table IA2.

Table 7
Evolution of dividend-payers for a constant sample and firms listed before vs. after 1978.
We tabulate the actual percentage of dividend payers and actual minus expected percentage of dividend payers for firms with IPOs before 1978 (columns 1 and 2), and firms with IPOs in 1978 or later (columns 3 and 4). The expected percentage of dividend payers is calculated as in Table 3. Panel A presents five-year averages with t-statistics with standard errors adjusted as per Newey and West (1994); Panel B presents the average and standard deviation since 1978. More details on sample selection and variable definitions are in the Internet Data Appendix.

	(1)	(2)	(3)	(4)
Panel A: Five year averages				
	IPO before 1978		IPO in 1978 or later	
Years	Actual percentage dividend payers	Actual minus expected	Actual percentage dividend payers	Actual minus expected
1963–1965	91.0	3.6		
		(2.88)		
1966–1970	76.3	7.5		
		(2.90)		
1971–1975	62.6	−5.8		
		(−6.13)		
1976–1980	71.9	1.3		
		(4.13)		
1981–1985	70.2	2.5	16.8	−19.0
		(2.80)		(−17.19)
1986–1990	66.8	0.2	15.5	−21.3
		(0.22)		(−29.29)
1991–1995	65.1	−2.0	16.5	−20.2
		(−1.98)		(−55.99)
1996–2000	66.5	−3.4	13.4	−23.2
		(−4.58)		(−15.29)
2001–2005	65.8	−2.2	16.6	−21.1
		(−3.17)		(−14.87)
2006–2010	69.1	−0.4	20.9	−19.8
		(−0.58)		(−21.82)
2011–2015	73.7	−0.3	28.3	−16.2
		(−0.11)		(−9.14)
2016–2018	78.0	6.2	28.4	−12.0
		(3.01)		(−12.32)
Panel B: Summary since 1978				
Mean since 1978	69.3	−0.1	19.5	−19.4
St.Dev since 1978	4.2	3.4	5.8	3.7

firms with more recent IPOs continue to have a lower proclivity to pay, even when they are profitable and have low earning volatility. Thus, changes in the proclivity to pay dividends are not due to firms that change their policy, but rather to the relative presence of firms with IPOs in 1978 or later.

4.2. Changes in the regulatory structure

Some of the aggregate changes in the proclivity to pay dividends could result from changes in firms regulatory environment. Following the passage of SEC rule 10b-18 in 1982, legal protections were offered to repurchasing firms, making it easier for firms to repurchase shares instead of paying dividends (Grullon and Michaely, 2002). Repurchases have since continued to gain popularity (Fig. 1b). A substitution of repurchases for dividends seems plausible, considering our finding that newer firms are responsible for changes in the proclivity to pay dividends (Section 4.1). Firms that went public around or after SEC rule 10b-18 could be less likely to commit to a stickier payout policy such as dividends. This notion is supported by survey evidence from Brav et al. (2005), indicating that many firms that pay dividends wish they did not and would prefer to pay out in the form of repurchases.

Fig. 1b and Table 8 show the percentage of firms with positive payout in our sample over time.[14] The prevalence of positive-payout firms decreases from 78.2% in 1978 to a low of 41.0% in 1996, then increases to 71.2% by 2018. Recall from Table 3, Panel B, that the prevalence of dividend payers is 72.7% in 1978, declines to 23.0% in 2002, and recovers to 36.0% by 2018. The less extreme trends in payout policy than in dividend policy suggest a substitution of repurchases for dividends.

[14] We quantify repurchases as the total expenditure on the purchase of common stocks, as per the definition in Grullon and Michaely (2002). This measure, equivalent to gross repurchases, maintains consistency with our preceding analysis, which uses a measure of gross (not net) dividends. However, our results do not materially change when we use a measure of net repurchases, as per Fama and French (2001). We define a firm with positive payout as one with positive gross dividends or positive gross repurchases for that year.

Table 8
Actual and expected firms with positive payout (dividends + repurchases).
We tabulate the number of firms in the sample (column 1), the number of firms with positive payout (column 2), and the percentage of total firms with positive payout (column 3). The expected percentage of positive-payout firms (column 4) is calculated as in Table 3. The actual minus expected percentage of payers is reported in column 5, with t-statistics (using Newey–West standard errors) in parentheses. Averages for roughly five-year periods are presented in Panel A; annual values for pivotal years discussed in the paper are presented in Panel B. More details on sample selection and variable definitions are in the Internet Data Appendix.

	(1)	(2)	(3)	(4)	(5)
Years	Number of firms	Number of payers	Percentage of payers	Expected percentage of payers	Actual minus expected percentage
1963–1965	460	419	91.0	88.8	2.2
					(1.80)
1966–1970	1200	896	76.3	72.4	4.0
					(1.29)
1971–1975	2341	1651	70.0	72.6	−2.6
					(−10.38)
1976–1980	2819	2114	75.1	73.1	2.0
					(3.21)
1981–1985	3292	1958	59.7	59.5	0.2
					(1.03)
1986–1990	3453	1751	50.7	52.8	−2.1
					(−0.72)
1991–1995	3752	1634	43.7	49.9	−6.2
					(−10.56)
1996–2000	4116	1872	45.7	47.6	−1.9
					(−1.25)
2001–2005	3141	1501	47.8	47.7	0.1
					(0.23)
2006–2010	2675	1454	54.4	50.0	4.4
					(3.57)
2011–2015	2328	1455	62.5	53.3	9.2
					(3.19)
2016–2018	2195	1513	68.9	49.0	20.0
					(38.04)
Panel B: Selected years					
Years	Number of firms	Number of payers	Percentage of payers	Expected percentage of payers	Actual minus expected percentage
1978	2697	2110	78.2	74.5	3.7
1994	4001	1652	41.3	50.4	−9.1
1996	4274	1754	41.0	48.0	−6.9
2000	3723	1759	47.2	48.5	−1.3
2018	2187	1557	71.2	50.3	20.9

More formally, we estimate Eq. (3), which is identical to Eq. (1) except that the dependent variable, $P_{payout,it}$, is a dummy for whether firm i has a positive payout (pays dividends and/or repurchases shares) in year t:

$$\log\left(\frac{P_{payout,it}}{1-P_{payout,it}}\right) = \beta_0 + \beta_1 * \frac{E_{it}}{A_{it}} + \beta_2 * \left(\frac{dE_{it}}{(A_{it}+A_{it-1})/2}\right)^2 + \beta_3 * NYP_{it} + \beta_4 * \frac{V_{it}}{A_{it}} + \beta_5 * \frac{dA_{it}}{(A_{it}+A_{it-1})/2} + \epsilon_{it} \quad (3)$$

The results of this estimation are reported in Table 2, column 3. All coefficients are significant at the 95% level. Consistent with our estimates of Eq. (1), profitability and size have a positive coefficient, whereas earnings volatility, asset growth, and Tobins Q have a negative coefficient. The order of the economic significance is also the same as for Eq. (1), as profitability, earnings volatility, and size have the largest economic impact.

Fig. 5 shows the actual percentage of firms with positive payout, the expected percentage of firms with positive payout (calculated using Eq. (2)), and the difference between them. These results are also summarized in Table 8, Panel A, for five-year intervals. The gap between actual and expected firms with positive payout attains its trough in 1994 at −9.1 pp (Table 8, Panel B, column 5). Recall that the difference between actual and expected dividend payers is widest at −21.7 pp, more than double the maximum gap for firms with positive payout. The much smaller gap in payout implies that the change in the overall proclivity to pay out is less than the change in the proclivity to pay dividends specifically. As such, a substitution of repurchases for dividends appears to explain a portion of the changing proclivity to pay dividends.

The results in Table 8 and Fig. 5 also indicate that any decrease in the total proclivity to pay out is short lived compared with changes in the proclivity to pay dividends. The gap between actual and expected firms with positive payout does not begin increasing until the late 1980s and

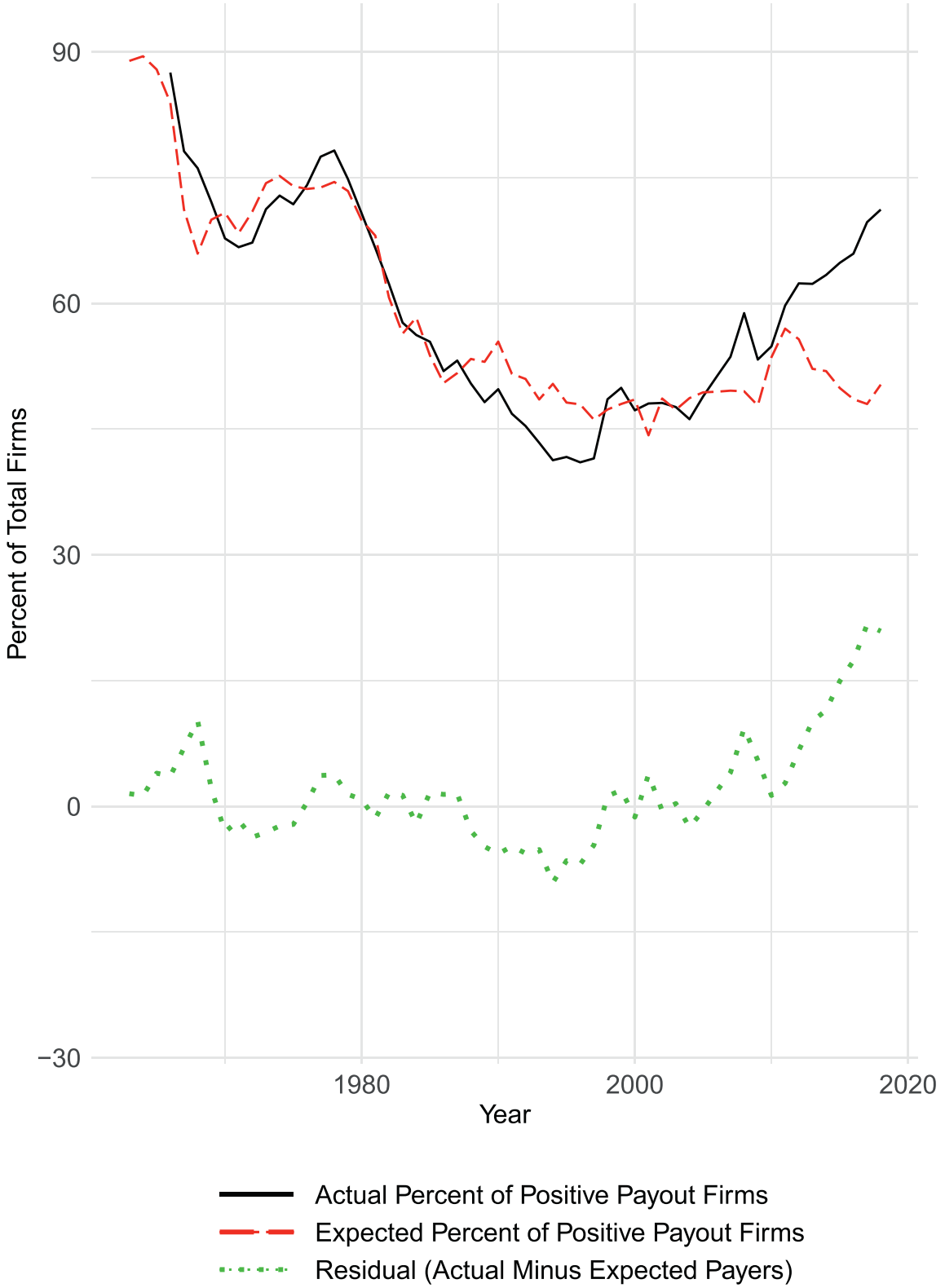

Fig. 5. Projected vs. actual payout. This figure shows the percentage of actual and expected firms with positive payout and the difference between actual and expected values (details of sample construction and variable definitions are in the Internet Data Appendix). The expected percentage of firms with positive payout is computed as in Table 8.

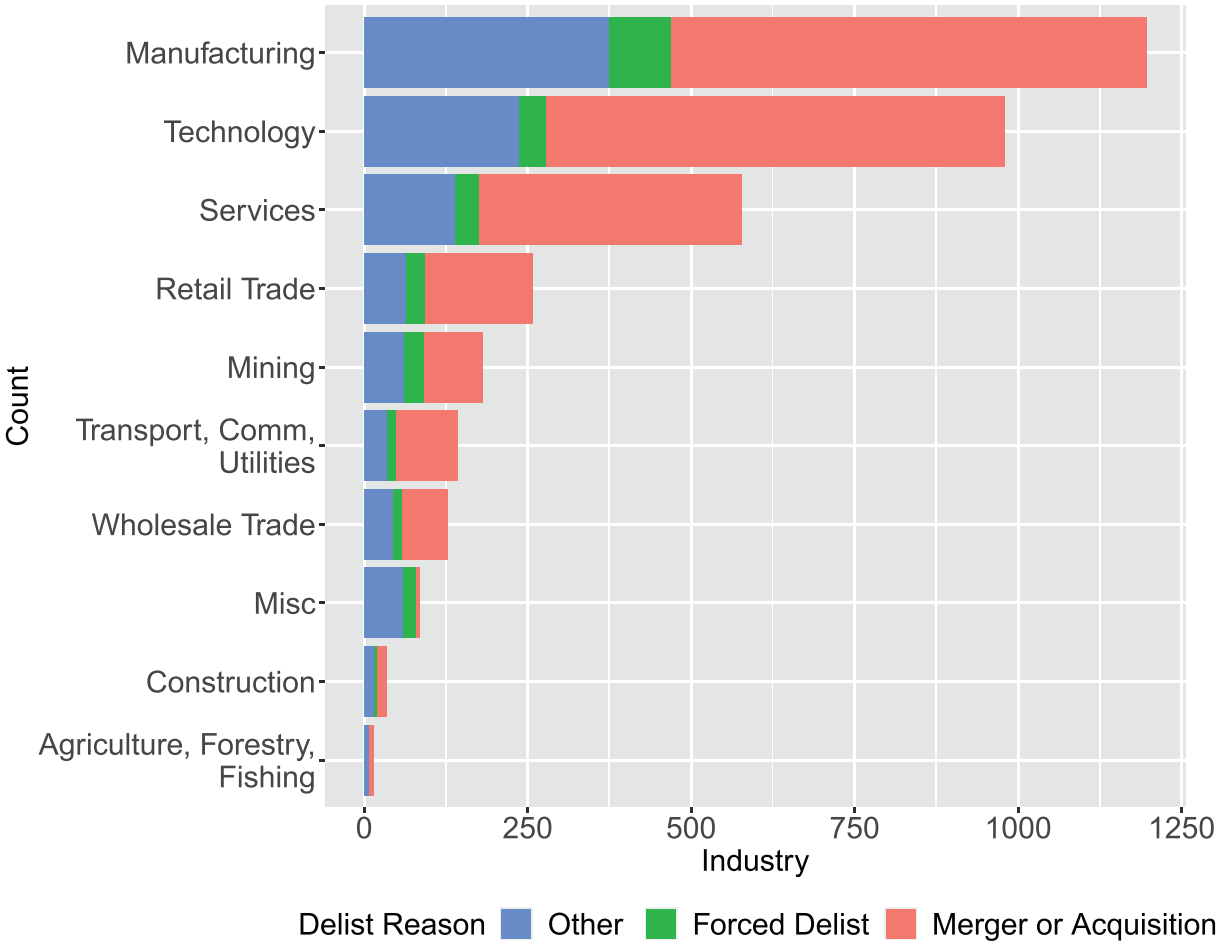

Fig. 6. Firm delisting reasons by industry. This figure summarizes firms delisted after 2000 by industry and delisting reason. Industries are defined by SIC sector, with the exception of tech firms, which are classified according to Loughran and Ritter (2004). We classify firms with CRSP delist codes from 200 to 399 as a merger or acquisition, and firms with delist codes 400–499, 574, and 580 as forced delistings (more details on firm classification are in the Internet Data Appendix).

reverses much sooner. By 1998, the gap between actual and expected firms with positive payout is not statistically distinguishable from zero. By contrast, decreases in the proclivity to pay dividends start in the late 1970s and are yet to fully recover.

Dividends reappear around 2000 despite firms increasing repurchases. The popularity of repurchases continues to grow even after 2000, while dividends start to reappear (Fig. 1b). The growth in repurchases occurs to the extent that the actual number of firms with positive payout exceeds the expected number of firms with positive payout for 15 of the last 18 years of our sample (e.g., Fig. 5). During the same period, expected dividend payers continue to exceed the actual number by a significant margin (e.g., Fig. 3, Table 3).

Overall, the evidence supports a substitution away from dividends toward repurchases while dividends disappear (1978–2000). However, firms continue to increase their use of repurchases even while dividends reappear, to the extent that firms overall proclivity to pay out (dividends + repurchases) after 2000 is higher than before 1978.

4.3. Changes in the composition of publicly traded firms and dividends' reappearance

Although generational differences and the substitution effect significantly contribute to dividends disappearing, neither adequately explains the increase in the percentage of dividend-paying firms since 2000. Indeed, Fig. 1a and Table 1 show no sustained increase in the number of dividend payers after 2000. Instead, we consider whether the dividend reappearance is attributable to a change in environment that causes nonpaying firms to delist. We explore the impact of different types of firms that might be dropping out of the sample on the dividend reappearance since the 2000s. First, because dividends begin to reappear around the bursting of the tech bubble, we examine whether tech firms delist at disproportionately high rates. Second, in light of recent literature on the rising concentration of industries since 2000 (e.g., Gutirrez and Philippon, 2017; Grullon et al., 2019), we also test if a disproportionately high rate of mergers and acquisitions among non-dividend-paying firms

drives up the aggregate percentage of dividend-paying firms.

One possible change in the environment responsible for the shrinking number of nonpaying firms after 2000 could be the bursting of the tech bubble. Indeed, we find that tech firms present in the sample in 2000 are 5 pp more likely to delist before 2004 than non-tech firms over the same period, a difference that is statistically significant at the 95% level.[15] However, this higher delisting rate for tech firms is short lived and cannot explain the longer-term decline in the number of listed firms. The difference in delisting rates among tech and non-tech firms that are present in 2000 shrinks to a statistically insignificant 3 pp when we consider the entire reappearing-dividends period. We also consider the possibility that, although tech firms delist at similar rates to non-tech firms from 2000 to 2018, they could be more likely to experience a forced delisting, that is, a delisting due to bankruptcy, not meeting exchange requirements, and so on. Fig. 6 shows the number of delistings after 2000 by industry and delisting reason, and illustrates that forced delistings are rare in all industries, including tech. We find that forced delistings account for only 5% of tech-firm delistings, which is statistically indistinguishable from the 5% of non-tech firm delistings. Thus far, none of these results suggest that the bursting of the tech bubble materially contributed to the reappearing-dividends phenomenon.

Fig. 6 also shows that mergers and acquisitions are by far the most common delisting reason in almost every industry, consistent with the consolidation and increasing concentration found across industries in Grullon et al. (2019). Of the 4750 firms that delist from our sample after 2000, 2,511, or over half, are due to mergers or acquisitions. By contrast, only 348 are liquidated or forced to delist over the same period. Moreover, 84% of the firms that delist are not dividend payers. The substantially higher delisting rate for nonpaying firms mechanically increases the percentage of dividend-paying firms.

To quantify the magnitude of the role of delisting firms on the reappearing-dividends phenomenon more formally, we construct a synthetic sample wherein the firms that delist after 2000 instead stay listed until 2018. Essentially, we "add back" to the synthetic sample all firms that delisted after 2000. For the purposes of this exercise, we assume all of the delisted firms would not have changed their payer status if they had stayed listed. Then, we calculate the percentage of firms that would have paid dividends in the absence of any delistings after 2000. These results are presented in column 2 of Table 9. We also calculate what percentage of firms would have paid dividends if there were no mergers or acquisitions after 2000 but delistings due to other reasons still occurred (Table 9, column 3).

We find that if none of the delistings from 2001 to 2018 had occurred, the prevalence of dividend-paying firms would have stayed around 20%-23%, comparable to the actual 23.4% of dividend payers present in 2000 (Table 9, column 1). Notably, this counterfactual percentage does not exhibit a reappearing-dividends trend. That is, if all the firms that delisted after 2000 had stayed listed, dividends would not have reappeared. The results using this synthetic sample show that the dividend-reappearing phenomenon can be entirely accounted for by firms that delist.

Table 9
Synthetic samples: the impact of firms delisting on the percentage of dividend-paying firms.
We tabulate the actual percentage of dividend-paying firms in each year during the reappearing-dividends period (column 1). The synthetic sample used in column (2) includes listed firms and all firms that delisted after 2000 (for any reason), and assumes delisted firms would have kept their dividend policy unchanged. The synthetic sample used in column (3) includes listed firms and only firms that delisted because of a merger or acquisition after 2000, and assumes delisted firms would have kept their dividend policy unchanged. More details on sample selection and variable definitions are in the Internet Data Appendix.

	(1)	(2)	(3)
	Percentage of sample that pays dividends		
Year	Actual sample	Synthetic sample where no firms delist after 2000	Synthetic sample where no M&A occurs after 2000
2000	23.4	23.4	23.4
2001	22.9	21.2	22.5
2002	23.0	20.2	22.3
2003	26.4	21.6	24.7
2004	29.0	22.6	26.2
2005	30.5	23.2	27.1
2006	30.7	22.9	26.9
2007	30.2	22.6	26.7
2008	29.8	21.6	25.9
2009	28.5	20.3	24.7
2010	30.2	20.6	25.4
2011	32.4	21.1	26.2
2012	37.5	22.7	28.5
2013	37.0	22.3	28.1
2014	37.6	22.4	28.3
2015	37.3	22.2	28.1
2016	36.9	21.9	27.7
2017	36.6	21.7	27.5
2018	36.0	21.5	27.3

We use a second counterfactual to quantify the specific role of mergers and acquisitions. In this case, we create a synthetic sample in which firms that delist due to a merger or an acquisition after 2000 instead stay listed until 2018 (unlike the previous test, we do not add synthetic observations for firms that delist due to other reasons). Dividend payers increase from 23.4% in 2000 to 27.3% in 2018 (Table 9, column 3) in this synthetic sample. In actuality, the percentage of dividend-paying firms increased to 36.0% in 2018, an incline three times as steep as in this synthetic sample. If none of the post-2000 M&As had occurred, dividends would have reappeared to one-third of the extent that they actually did. Therefore, mergers and acquisitions account for approximately two-thirds of the reappearing-dividends phenomenon. Contrasting the results in Table 9, column 2 (initial counterfactual in which no delistings occur since 2000), with the results of column 3 (second counterfactual wherein only firms that delist due to M&A after 2000 stay listed) suggests that the remaining one-third of the reappearing-dividends phenomenon is ostensibly due to firms that delisted for other reasons.

[15] We define a tech firm using SIC codes as per Loughran and Ritter (2004). Additional details are in the Internet Data Appendix.

In sum, non-dividend-paying firms delisting at a higher rate than dividend-paying firms is the likely explanation for the reappearing-dividends phenomenon. Our results from Section 3.3 show that reappearing dividends are driven primarily by changes in the proclivity to pay dividends. Combined with the results from this section, it appears that the aggregate proclivity to pay dividends is changing because of delisting by firms with a low proclivity to pay.

5. Discussion and conclusion

We examine the impact of changing firm characteristics and proclivity to pay dividends on dividend disappearance in the last quarter of the 20th century and dividend reappearance in the first two decades of the 21st century. Within our sample, changes in firm characteristics drive 53% of the dividend disappearance, and changes in the proclivity to pay dividends drive the remaining 47%. We find that, consistent with Lintner (1956), few dividend-paying firms stop paying dividends. Rather, newer firms drive the disappearing-dividends trend. The subsequent reappearance was mostly due to changing proclivity (82%), but also partly due to the decreasing presence of high-earnings-volatility firms.

A series of subsample analyses reveals that firms with IPOs before 1978 exhibit no disappearing or reappearing dividends. Firms with IPOs in or after 1978 are more likely to have characteristics typical of firms that are unlikely to pay dividends, particularly low profitability and high earnings volatility. Additionally, firms with recent IPOs that report high earnings and low earnings volatility are much less likely to pay dividends than their older peers with similar characteristics. These results might suggest that firms' IPO cohort has become a factor that is relevant to dividend prediction models.

The disappearing-dividends phenomenon reverses around 2000. The gap between actual and expected dividend payers is −21.4 pp in 2000 and declines in magnitude to a smaller but still significant −11.1 pp by 2018. After accounting for repurchases, the gap between actual and expected payout is much smaller and short-lived: it is only negative for eight years and completely closes even before the 2000s. Although substitution to repurchases can plausibly explain a portion of the disappearing-dividends phenomenon, the reappearing-dividends phenomenon is driven almost entirely by high rates of delisting among nonpaying firms. The increasing prevalence of mergers and acquisitions over the past two decades results in a high delist rate among non-dividend-paying firms (especially with low proclivity to pay and high earnings volatility). If these delistings had not occurred, the percentage of dividend-paying firms would not have increased after 2000.

Our findings also underscore the important roles played by factors omitted from the empirical model (e.g., earnings volatility) and changes in market structure (e.g., regulatory environment) over time. Interestingly, the effects of changing characteristics and proclivity come from different subsets of firms. Changes in dividend policy resulting from changes in firm characteristics can be almost solely attributed to high-earnings-volatility and low-profitability firms. Changes in the proclivity to pay dividends are driven by stable, profitable firms. The regulatory changes associated with SEC rule 10b-18 and the emergence of repurchases as a significant payout method also seem to explain the dividend disappearance, as many firms started to pay out in the form of repurchases rather than dividends.

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