Disappearing Dividends, Catering, and Risk

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Fama and French (2001a) show that the propensity to pay dividends declines significantly between 1978 and 1999. We examine this "disappearing dividends" puzzle through the lens of risk and report two main findings: (i) Risk is a significant determinant of the propensity to pay dividends, and it explains roughly 40% of disappearing dividends; (ii) We find little support for the view that disappearing dividends reflects firms' catering to transient fads for dividends. Absent risk controls, proxies for fads matter, but these proxies are insignificant once we control for risk. Our results are robust to an extensive battery of robustness tests that vary samples, time periods, proxies for fads, the types of empirical tests, and the nature of payout decisions made by firms. (*JEL* G15, G30, G38)

In an interesting article, Fama and French (2001a) show that the propensity to pay dividends declines dramatically between 1978 and 1999; while 66.5% of listed firms paid dividends in 1978, only 20.8% did so in 1999. Fama and French find that the decline in the propensity to pay is partly explained by changes in the characteristics of listed firms, such as size, book-to-market ratio, asset growth, and profitability. However, even after controlling for these characteristics, the propensity to pay dividends still declines, a phenomenon that Fama and French call "disappearing dividends."

The disappearing dividends phenomenon is a striking empirical regularity that demands explanation. Baker and Wurgler (2004a, 2004b)—henceforth BW—provide one based on behavioral finance. According to BW, investors have temporary fads for dividends. When prodividend fads are high, dividend payer valuations increase. Conversely, when the fascination for dividends drops, payer valuations decline. BW argue that firms' dividend policies "cater" to these fads. Empirically, BW find that a proxy for dividend fads explains close to 30%

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of the changes in the Fama and French (2001a) propensity to pay, suggesting that behavioral fads are first-order determinants of disappearing dividends.

In this paper, we examine the disappearing dividends phenomenon through the lens of an old-fashioned variable, viz., risk. We conduct two sets of tests. First, we examine whether risk explains disappearing dividends. We report that risk is both statistically and economically significant and explains roughly 40% of the disappearing dividends puzzle. Our second test revisits the catering explanation for disappearing dividends. Catering predicts that dividend fads should explain changes in the Fama and French (2001a) propensity to pay dividends, and as a corollary, that caterers should experience negative long-term returns as fads dissipate. We find no support for either prediction. As in BW, we find that fad proxies explain disappearing dividends if we do not control for risk. However, once we control for risk, fads have essentially zero explanatory power. The long-term returns for firms that cater are reliably positive. Our results are robust to an extensive battery of robustness checks that vary samples, time periods, proxies for fads, specifications, and different payout decisions of firms.

We begin by examining whether risk explains the Fama and French (2001a) disappearing dividends phenomenon. As in Fama and French, we estimate a logit specification that models the probability of being a dividend payer. Like them, we find that larger, more profitable firms with low market-to-book and asset growth are more likely to pay dividends. We add risk to the baseline logit specification, and find that risk is at least as significant as the other Fama and French (2001a) variables. We then investigate the extent to which risk explains disappearing dividends, and using three simple measures, we find that risk explains roughly 40% of disappearing dividends. This explanatory power more than doubles when we incorporate both risk and a structural shift dummy identifying the post-1983 period, when safe harbor provisions led to an increased use of share repurchases (Grullon and Michaely 2002).

We next turn to the catering explanation for disappearing dividends. If catering matters, BW argue that proxies for dividend fads should explain changes in the propensity to pay dividends. We empirically test this prediction using the dividend premium (the logarithmic difference between the market-to-book ratio of dividend payers and nonpayers), which is the main proxy for dividend fads employed by BW. Like BW, we find that the dividend premium is significantly related to the changes in the propensity to pay, with an R^2 of up to 30% when we do not control for risk. Once we adjust the propensity to pay for risk, the dividend premium becomes insignificant and the regression R^2 is essentially zero. Thus, this key catering proxy has little power to explain disappearing dividends once we account for risk.

We conduct several tests to verify the robustness of the above result. We extend the BW sample (1963 to 2000) by four years to include 2001 to 2004, which allows us to examine one additional cycle in both dividends and risk. We also switch from the in-sample BW methodology to the out-of-sample method used by Fama and French (2001a).[1] The dividend premium remains insignificant in all specifications. We consider three alternate proxies for fads, including two nondividend-specific fad proxies suggested by BW, and one dividend-specific fad proxy: the average initiation announcement return. This latter measure is appealing due to its simpler intuition, and because BW argue that dividend initiation returns are the primary mechanism by which fad-driven investors make themselves heard by managers. Once we control for risk, we find little evidence in favor of fads in any of these tests.

Because our findings on the propensity-to-pay predictions of catering theory are strong, we consider additional predictions that can be tested outside the payer/nonpayer framework, and especially in disjoint databases. We first test the prediction that firms who cater to fads should experience negative long-term returns because gains attributed to fads are transient. Consistent with prior work (e.g., Michaely, Thaler, and Womack 1995), we find that the long-run returns of these firms are reliably positive, even in periods when fad proxies are especially high. Second, because the catering theory rests on the assumption that fads are driven by retail investors, we test the prediction that firms that cater should experience increased retail ownership. We find that *institutions* rather than retail investors increase their ownership, perhaps reflecting the prudent man investing rules that motivate an institutional preference for dividend payers (Brav and Heaton 2004 and Grinstein and Michaely 2005). Our broad results from both tests do not square well with catering theory.

Our final out-of-sample tests of robustness broaden the canvas to other payout decisions. To motivate this analysis, Allen and Michaely (2003) point out that other payout decisions are economically important pieces of the aggregate supply of cash payouts to shareholders. For instance, over 90% of the aggregate dividend supply comes from firms that already pay dividends. The decisions of these firms are not captured in the pay/do-not-pay logit models. Allen and Michaely also point to the growing importance of repurchases since 1983. In tests that parallel the structure of our disappearing dividends analysis, we find no evidence that fads matter in the broader vector of payout decisions.

The remainder of the paper is organized as follows. Section 1 reviews the literature on disappearing dividends and the related broader literature on dividend policy. Section 2 describes the data. Section 3 explores the role of risk in explaining disappearing dividends. Section 4 revisits the catering explanation for disappearing dividends. Section 5 motivates and explores the catering implications for long-term returns and institutional ownership. Section 6 examines broader payout decisions. Section 7 reconsiders the fad interpretation of the dividend premium. Section 8 concludes.

[1] Fama and French (2001a) use estimates of logit models based on data from 1963 to 1977 to compute out-of-sample propensities to pay between 1978 and 1999.

1. Dividend Literature

The literature on dividend policy is extensive. Allen and Michaely (2003) provide a recent and comprehensive review of the literature. We focus on the portions of the dividend literature dealing with disappearing dividends and risk.

The disappearance of dividends was first documented by Fama and French (2001a). The work by Fama and French led to several papers that take on the challenge of explaining or clarifying their striking results. DeAngelo, DeAngelo, and Skinner (2004) clarify the nature of disappearing dividends. They point out that the dollar supply of dividends does not mimic the disappearing dividends trend, indicating that over time, dividends have become more concentrated among fewer payers. Grullon and Michaely (2002) similarly report that total cash payouts to shareholders in the form of repurchases and dividends have not declined. They attribute their findings to a compensating growth in repurchases since the November 1982 adoption of safe harbor provisions for firms conducting repurchases. Julio and Ikenberry (2004) find that the disappearing dividends trend begins reversing after 2000, and Chetty and Saez (2005) investigate the role of the 2003 dividend tax cut in this trend. International evidence on disappearing dividends is provided by Denis and Osobov (forthcoming) for Canada, France, Germany, Japan, and the United Kingdom. More recently, von Eije and Megginson (forthcoming) analyze disappearing dividends for countries in the European Union. The catering explanation for disappearing dividends, offered by BW, finds no support in the international data studied by Denis and Osobov and von Eije and Megginson.

We offer evidence that risk explains disappearing dividends. The link between risk and dividends is strongly rooted in the dividend literature. Perhaps the earliest link comes from the classic field survey of managers by Lintner (1956). Lintner reports that managers are conservative in setting dividend policy. In particular, managers are reluctant to make upward changes in dividends that may have to be reversed in the future. While conservatism is first noted in the Lintner (1956) survey of 28 firms, it still stands as perhaps the most robust fact about dividend policy five decades later in a much larger survey of 384 executives conducted by Brav et al. (2005). Conservatism in setting dividends implies a negative relation between dividends and risk. In fact, in the Brav et al. survey, managers also explicitly cite risk as an important consideration in their dividend decisions.

Empirical evidence on dividend announcement effects also motivates a negative relation between risk and dividends. The evidence on announcement effects is abundant (see, for example, Aharony and Swary 1980; Asquith and Mullins 1983; Healy and Palepu 1988; Michaely, Thaler, and Womack 1995; Grullon, Michaely, and Swaminathan 2002; and Amihud and Li 2006). The Allen and Michaely (2003) literature review summarizes this evidence. Initiations have positive announcement effects of around 3% while omissions have announcement effects of close to −7%. Likewise, increases have average announcement effects of around 1% while decreases have announcement effects of nearly −3%. This evidence can be interpreted as either a cause for why firms avoid dividend cuts, or a theoretical consequence of rational expectations when firms are known to be averse to cutting dividends. In either case, the implication of a penalty for reversing upward dividend changes is that firms with greater risk are less likely to initiate or increase dividends, since risky firms are more likely to face a scenario in which a prior decision needs to be reversed.

Grullon, Michaely, and Swaminathan (2002) and Allen and Michaely (2003) argue that firm maturity is a key determinant of dividend policy. A negative relation between dividends and risk—now interpreted as a proxy for firm maturity—follows. The firm maturity motivation for paying dividends is developed quite thoroughly in Grullon, Michaely, and Swaminathan (2002), who analyze 6284 dividend increases and 1358 decreases announced between 1967 and 1993. Venkatesh (1989) provides related evidence based on a sample of 72 initiations. Interesting evidence for the maturity hypothesis is offered by Koch and Sun (2004), who find that earnings changes are more persistent when accompanied by dividend increases. In a different experiment, Jagannathan, Stephens, and Weisbach (2000) show that dividend payers tend to have lower risk than nonpayers or repurchasers. Finally, Eades (1982) presents cross-sectional evidence on the role of risk. He finds that higher dividend yields are associated with lower risk. We verify this relation in our sample for the 1963–2004 period.

Empirically, a role for risk in explaining disappearing dividends is also suggested by a recent stream of papers documenting an increase in idiosyncratic risk in the 1990s. These papers include Campbell et al. (2001), Campbell and Taksler (2003), Brandt, Brav, and Graham (2005), and Fink et al. (2006). Pastor and Veronesi (2003) argue that this 1990s elevation of risk reflects greater cash-flow risk. A related point is made by Fama and French (2001b), who find a secular decrease in the survival rates of new lists over a similar period, indicating that listed firms became more risky in the 1990s. Malkiel and Xu (2003) argue that idiosyncratic risk is related to greater future growth, while Durnev, Morck, and Yeung (2003) argue that it reflects increased firm-specific price discovery. Each of these factors makes firms less likely to pay dividends.

Our study of long-term returns is related to the now vast literature on post-announcement drifts. The analysis of drifts is, of course, the staple of empirical tests of semi-strong efficiency (Fama 1998). On postannouncement drifts related to dividend announcements, Charest (1978) finds a 4% positive drift over two years after increases and a −8% drift after decreases. Grullon and Michaely (2002) find an 8% positive drift over three years after increases (see also Benartzi, Michaely, and Thaler 1997) but no significant drift after decreases. Michaely, Thaler, and Womack (1995) find a three-year buy-and-hold return of 25% after initiations and −15% after omissions. Brav and Heaton (2004) find that the negative returns for omitters are concentrated in time periods after the 1974 enactment of the Employee Retirement Income Security

Act and the related prudent man rules that lead to an institutional preference for dividend-paying stocks.

Grinstein and Michaely (2005) extensively analyze institutional ownership and dividend policy. They report that institutional holdings are higher for payers but institutions show no particular preference for dividend levels. Graham and Kumar (2006) find that individuals have no preference for dividend payers, but within dividend payers tend to prefer higher dividend-paying stocks. Allen, Bernardo, and Welch (2000) present a theory of institutional ownership and dividend policy. Interestingly, while firms cater to individual sentiments for dividends in catering theory, in the Allen, Bernardo, and Welch model, dividends are used to attract *institutional* rather than *retail* shareholders because institutions bring value to the table through monitoring or facilitating takeovers.

Finally, our work is relevant to the literature on behavioral corporate finance. BW examine the dividend premium, which is the price (log M/B) spread between payers and nonpayers, as a proxy for behavioral fads. We consider the complementary view that price spreads could reflect differences in risk and cash flows and find strong evidence for this view. Changes in the dividend premium load significantly on the Fama-French risk factors, and dividend premium can predict the future cash-flow growth of payers relative to nonpayers. Thus, in our view, an unqualified behavioral interpretation of price variables such as M/B spreads warrants a healthy dose of skepticism.[2]

2. Data

We analyze the dividend decisions of firms from 1963 to 2004. The Compustat sample for calendar year t, 1963–2004, includes those firms with fiscal year-ends in t that have the following data (Compustat data items in parentheses): total assets (6), stock price (199), and shares outstanding (25) at the end of the fiscal year, income before extraordinary items (18), interest expense (15), dividends per share by ex date (26), preferred dividends (19), and (i) preferred stock liquidating value (10), (ii) preferred stock redemption value (56), or (iii) preferred stock carrying value (130). Firms must also have (i) stockholder's equity (216), (ii) liabilities (181), or (iii) common equity (60) and preferred stock par value (130). Total assets must be available in years t and $t-1$. The other items must be available in year t. We also use, but do not require, balance sheet deferred taxes and investment tax credit (35), income statement deferred taxes (50), purchases of common and preferred stock (115), sales of common and preferred stock (108), and common treasury stock (226). We exclude firms with book equity (BE) below \$250,000 or assets (A) below \$500,000.

[2] This discussion echoes a similar ambiguity that the literature encounters in interpreting closed-end fund discounts. See Lee, Shleifer, and Thaler (1991); Chopra etal., (1993a, 1993b); Chen, Kan, and Miller (1993a, 1993b); Elton, Gruber, and Busse (1998); Qiu and Welch (2005); and Berk and Stanton (2007).

To ensure that firms are publicly traded, the Compustat sample includes only firms with CRSP share codes of 10 or 11, and we use only the fiscal years a firm is in the CRSP database at its fiscal year-end. The CRSP sample includes NYSE, AMEX, and NASDAQ securities with CRSP share codes of 10 or 11. A firm must have market equity data (price and shares outstanding) for December of year t to be in the CRSP sample for that year. We exclude utilities (SIC Codes 4900–4949) and financial firms (SIC Codes 6000–6999) from both samples. We derive the following variables from the resulting database.

- *Book Equity (BE)* = Stockholder's Equity (216) minus Preferred Stock plus Balance Sheet Deferred Taxes and Investment Tax Credit (35) minus Post Retirement Asset (330). If data item 216 is not available, it is replaced by either Common Equity (60) plus Preferred Stock Par Value (130), or Assets (6) − Liabilities (181). Preferred Stock is Preferred Stock Liquidating Value (10) [or Preferred Stock Redemption Value (56), or Preferred Stock Par Value (130)].
- *Market Equity* = Fiscal year closing price times shares outstanding.
- *NYSE% (NYSE percentile)* = NYSE market capitalization percentile, i.e., the fraction of NYSE firms having equal or smaller capitalization than firm i in year t.
- *M/B (market-to-book ratio)* = Book assets minus book equity plus market equity all divided by book assets.
- *Asset growth* = Percent growth in assets (6) from year $t - 1$ to year t.
- *Earnings/Assets (profitability)* = Earnings before extraordinary items (18) plus interest expense (15) plus income statement deferred taxes (50) divided by assets (6).
- *Dividend Payer* = A firm is a dividend payer in calendar year t if it has positive dividends per share by the ex date (26) in the fiscal year that ends in year t.
- *Dividend Premium* = The difference in log book-value-weighted average market-to-book ratio (M/B) for dividend payers and for nonpayers as of the December of year $t - 1$.
- *Nixon Dummy* = A dummy variable equal to one for the years 1972–1974, and zero otherwise. This variable controls for the Nixon era dividend-freeze policy noted in Baker and Wurgler (2004a).
- *Idiosyncratic Risk* = A firm's idiosyncratic risk is the standard deviation of residuals from a regression of its daily excess stock returns (raw returns less the riskless rate) on the market factor (i.e., the value-weighted market return less the riskless rate).[3] One firm-year observation of idiosyncratic risk is computed using firm-specific daily stock returns from one calendar year.

[3] Previous versions of the paper use the multifactor Fama and French model and yield similar results.

- *Systematic Risk* = A firm's systematic risk is the standard deviation of the predicted value from the above regression used to define idiosyncratic risk.[4]

The distributional properties of our variables match those reported in prior studies, including Fama and French (2001a) and BW. Our idiosyncratic and systematic risk variables, which were not in these earlier studies, have means of 3.55% and 0.70%, respectively. These values can be interpreted as the average daily variability of stock returns that is either firm-specific (idiosyncratic) or market-driven (systematic). These variables have standard deviations of 2.35% and 0.58%, respectively, and both have values that are bounded below by zero. For large firms (those with NYSE% exceeding 0.5), the average idiosyncratic risk and systematic risk are 2.03% and 0.90%, respectively. Not surprisingly, larger firms are less volatile than smaller firms. Both risk variables have absolute correlations of less than 20% with the four Fama and French (2001a) characteristics (NYSE%, M/B, Asset Growth, and Earnings/Assets) with three interesting exceptions. Idiosyncratic risk has a correlation of −42% with NYSE%, consistent with smaller firms being more risky. Systematic risk has a correlation of 25% with NYSE%, consistent with larger firms making up a larger fraction of the market portfolio and having more market-driven volatility. Finally, idiosyncratic risk has a −38% correlation with Earnings/Assets, consistent with less profitable firms being less risky. The moderate nature of these correlations, and our large sample of 127,858 observations from 1963 to 2004, indicate that multicollinearity is not a problem for our analysis.

3. Disappearing Dividends and Risk

3.1 Logit estimates

We start by examining the role of risk in explaining disappearing dividends. Following Fama and French (2001a), we estimate a logit model explaining the probability that a firm is a dividend payer. The dependent variable y_{it} is one if firm i pays a dividend in year t and zero otherwise. The explanatory variables are the market-to-book ratio, asset growth, profitability, and NYSE size percentile. The reported coefficients and t-statistics are Fama and MacBeth (1973) time-series averages of the annual cross-sectional logit coefficients. The standard errors for the logit coefficients are adjusted for autocorrelation using a Newey-West (1987) adjustment to two lags.

Table 1 reports the logit results. There are 12 sets of estimates in the table, which are organized into three panels. Each panel covers a different time period and contains four specifications according to the variables included in the logit model. We report specifications with and without M/B, and of course, with

[4] Because both risk variables are computed from stock returns, they measure the risk of the equity component of the firm. Our results are materially unchanged if we replace both variables by the unlevered counterparts. We display results based on the equity-based risk variables to maintain simplicity.

Table 1
Logit models explaining which firms pay dividends

Dependent variable = dividend paying firm indicator

Row	Idiosyncratic	Systematic	Fama-French Variables: Market to book	Asset growth	Earnings/ assets	NYSE percentile	Observations
Panel A: 1962–2004							
(1)				−1.514	7.474	3.896	127,858
				(−8.44)	(9.03)	(19.77)	
(2)			−0.735	−1.076	10.458	4.559	127,858
			(−11.51)	(−6.42)	(7.74)	(23.04)	
(3)	−101.65	−104.84		−1.242	5.019	2.692	127,858
	(−12.49)	(−8.68)		(−8.43)	(6.39)	(8.49)	
(4)	−95.512	−97.917	−0.452	−0.988	6.804	3.135	127,858
	(−12.10)	(−8.74)	(−7.69)	(−7.16)	(7.04)	(9.45)	
Panel B: 1962–2000							
(5)				−1.547	7.696	4.034	115,069
				(−7.94)	(8.65)	(22.73)	
(6)			−0.758	−1.086	10.847	4.707	115,069
			(−11.26)	(−5.92)	(7.51)	(26.67)	
(7)	−101.23	−112.00		−1.253	5.293	2.858	115,069
	(−11.34)	(−9.43)		(−7.83)	(6.45)	(8.88)	
(8)	−95.126	−104.61	−0.465	−0.983	7.168	3.303	115,069
	(−10.97)	(−9.55)	(−7.30)	(−6.53)	(7.17)	(9.76)	
Panel C: 1962–1977							
(9)				−1.496	10.947	3.736	28,218
				(−4.06)	(9.41)	(19.36)	
(10)			−0.768	−1.160	16.239	4.331	28,218
			(−6.67)	(−3.14)	(9.60)	(19.72)	
(11)	−133.29	−110.31		−1.102	7.900	1.872	28,218
	(−17.04)	(−9.33)		(−3.63)	(5.69)	(5.77)	
(12)	−126.95	−110.18	−0.419	−0.896	10.709	2.313	28,218
	(−16.61)	(−9.84)	(−3.43)	(−3.10)	(8.13)	(6.01)	

The table reports Fama and MacBeth (1973) style estimates of a logit model with Newey-West t-statistics (two lags) in parentheses. One cross-sectional model is estimated per year. The dependent variable is equal to one for dividend-paying firms and is zero otherwise. Independent variables are idiosyncratic risk, systematic risk, market-to-book ratio, asset growth, earnings to assets, and NYSE percentile to which a firm's market capitalization belongs. These variables are defined in Section 2.

and without risk. The non-M/B specifications are reported because while Fama and French (2001a) report specifications with M/B included, BW also display a specification without M/B. The issue of whether to include M/B, and more importantly, how to interpret M/B, is interesting and substantive in its own right. We defer this issue and discuss it later (Section 4.2). For now, we report both sets of results and note that the results are similar under either approach.

Panel A of Table 1 reports the baseline estimates for our full sample period that extends through fiscal 2004. Rows (1) and (2) report estimates with the Fama and French (2001a) explanatory variables. The results are similar to those reported in Fama and French. More profitable and large firms are more likely to pay while firms with greater past asset growth and higher M/B, i.e., greater expected future growth, are less likely to pay. Each of these explanatory variables is significant at better than the 1% level, as reflected in the t-statistics.

In Rows (3) and (4) of Table 1, we add risk to the baseline Fama and French (2001a) logit models. We include both systematic risk and idiosyncratic risk in the specifications. Our hypothesis is that risk is negatively related to the probability of being a dividend payer. We find that risk matters even after including the other Fama and French controls in the logit model. Furthermore, the significance of risk does not depend on whether we include or exclude M/B in the logit model. Risk also does not alter the significance of the other variables, suggesting that it reflects an orthogonal component of the propensity to pay not captured by the other included variables. Is risk economically significant? One way of answering this question is to compute the marginal logit effects based on the estimates in Table 1. Idiosyncratic risk is economically more important. Changing idiosyncratic risk by one standard deviation shifts the logit probability of being a payer by 39%, while the effect of systematic risk is 9%.

Panels B and C of Table 1 report estimates for time periods other than 1962–2004. In Panel B, we replicate the four specifications reported in Panel A (with and without M/B and with and without risk) for the time period ending in 2000. These results are of interest because they correspond to the BW time period and also the timeframe in which dividends disappear in Fama and French (2001a). The disappearing dividends trend stops and starts reversing after 2001 (Julio and Ikenberry 2004). In Panel C, we report logit results that are based on a time period ending in fiscal 1977. This panel is of interest because Fama and French (2001a) use these pre-1978 logit estimates to compute future out-of-sample propensities to pay starting in 1978. Indeed, their disappearing dividends evidence rests on these out-of-sample logit estimates. The results in Panels B and C mirror those in Panel A: risk has a negative and statistically significant coefficient everywhere.

To visually depict disappearing dividends and the propensity to pay from 1963 to 2004 in Figure 1, we construct the propensity to pay (PTP) for year t based on the logit estimates in Row (2) of Panel A of Table 1.[5] PTP is the difference between the actual percentage of firms paying dividends in a given year and the expected percentage, which is the average predicted probability from the given logit model. Figure 1 visually depicts the average propensity to pay dividends with and without controls for risk. The upper panel confirms the Fama and French (2001a) finding that the propensity to pay has a pronounced downward trend starting around 1978. The lower panel shows that the risk-adjusted propensity to pay is closer to the X-axis, especially in the 1990s, indicating that risk explains a portion of disappearing dividends. However, even after accounting for risk, the propensity to pay in the later periods is lower than in the pre-1978 period, suggesting that disappearing dividends is only partly explained by risk.

[5] This specification is based on the same variables used by Fama and French (2001a). The figure looks similar if we use the corresponding models in Panel B or C.

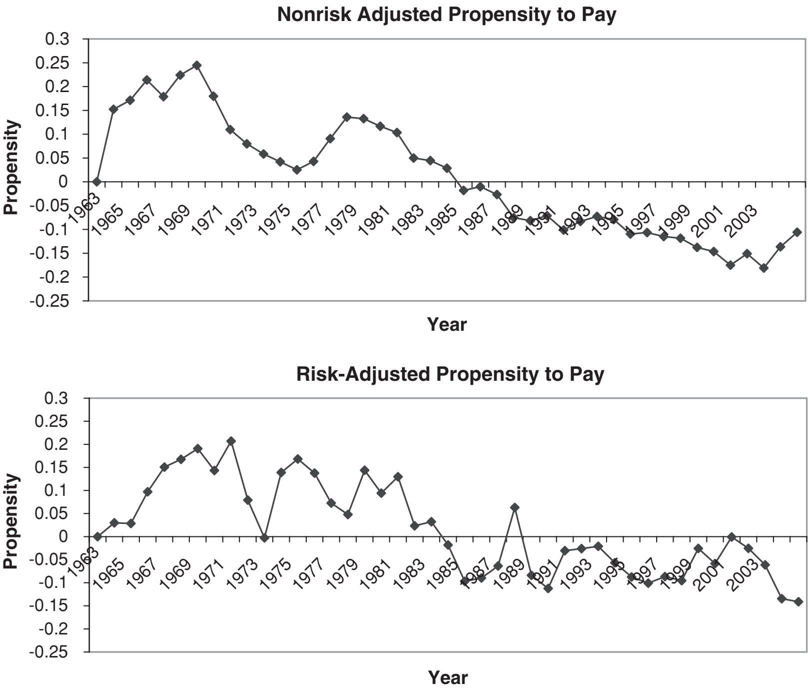

Figure 1
The propensity to pay dividends with and without controls for risk from 1963 to 2004
The propensity to pay is the difference between the actual fraction of firms paying dividends in a given year less the "expected" fraction of firms paying dividends. In the top figure, the expected number paying dividends is equal to the average predicted value from the logistic regressions including the same characteristic variables, as in Fama and French (2001): the M/B, asset growth, earnings divided by assets, and each firm's size percentile relative to NYSE percentile groupings. The bottom figure reports propensity that additionally controls for idiosyncratic and systematic risk. These variables are defined in Section 2.

3.2 Portion of disappearing dividends explained by risk

Table 2 estimates the extent to which risk can explain disappearing dividends. Consistent with Fama and French (2001a), we fit all logit models based on data from 1962 to 1977, and we compute out-of-sample propensities from 1978 to 1999 based on the corresponding fitted model. To examine the robustness of our findings, we measure the impact of risk on disappearing dividends in three ways. First, we adopt a difference-in-difference approach, and view disappearing dividends as the difference in the expected aggregate propensity to pay between 1978 and 1999 ($p_{1978} - p_{1999}$). The difference (with and without controls for risk in the fitted logit) in this difference ($p_{1978} - p_{1999}$) captures the impact of risk. Our second measure is the rate at which dividends disappear, which is the negative of the first derivative of propensity ($-\frac{dp}{dt}$). This measure is estimated as the slope of a regression (underlying regressions are in Panel A) of the propensity on a time trend line. Comparing the slopes based on propensities with and without controls for risk captures the impact of risk.

Table 2
Disappearing dividends and risk

Panel A: Regression

	Logit control variables	Trend line	1983 Structural break
(1)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%	−0.998	
		(−11.95)	
(2)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%	−0.750	−0.051
		(−7.72)	(−3.50)
(3)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%, Risk	−0.455	
		(−2.11)	
(4)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%, Risk	0.116	−0.119
		(0.43)	(−2.94)
(5)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%, Risk, Tech	−0.427	
		(−2.04)	
(6)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%, Risk, Tech	0.117	−0.113
		(0.45)	(−2.86)

Panel B: Percentage of disappearing dividends explained

	Disappearing dividends defined as		
Explanatory variables	Propensity (1999) – Propensity (1978)	Coefficient for trend line	Integrated propensity 1978–1999
$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%	−0.227	−0.998	−3.44
$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%, Risk	−0.137	−0.455	−2.30
$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%, Risk + 1983 Structural break	−0.0308	−0.116	−0.50
$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%, Risk, Tech + 1983 Structural break	−0.0302	0.117	−0.44

The table analyzes the percentage of the disappearing dividends phenomenon explained by risk. Panel A reports regressions in which the dependent variable is the propensity to pay dividends in year t, which is the fraction of firms actually paying dividends minus the average predicted probability that a firm is a payer in t. Following Fama and French (2001), the predicted probability is based on logit estimates fitted using data from 1963 to 1977 (reported in Table 1). Rows (1) and (2) are based on propensities constructed from the Fama and French characteristic variables without a risk adjustment. Later rows use propensities adjusted for risk and technology firms. The independent variables include a trend line equal to $t - 1977$ (so 1978 is year $t = 1$ and 1999 is $t = 22$) and a 1983 structural break dummy. Panel B reports the percentage of disappearing dividends explained by risk alone, risk and a 1983 structural break, and risk and a structural break plus a control for technology firms. The first column identifies the logit model used to construct propensities, and whether or not we control for the structural break. Column (2) represents disappearing dividends as the propensity to pay dividends in 1999 minus the 1978 propensity. Column (3) represents disappearing dividends as the rate of decline in propensity to pay, or the coefficient of the trend regressions reported in Panel (A). Column (4) models disappearing dividends as the integrated propensity to pay between 1978 and 1999.

Our third measure is the integrated propensity between 1978 and 1999, which reflects the average propensity to pay over the period. The difference between the integrated propensity based on fitted logits with and without controls for risk can be interpreted as the average impact of risk on disappearing dividends.

Panel B of Table 2 reports the results for each of the tests discussed above. Row (1) reports each measure with no control for risk, and Row (2) reports the same measure with controls for risk. The percentage difference between the two rows captures the impact of risk on the propensity to pay. Column 1 shows that the difference in the propensity to pay in 1999 and 1978 is −0.227 when we do not control for risk, and is −0.137 with risk controls. Using the difference-in-difference approach, risk attenuates the decline in the propensity to pay by 39.64%. In other words, risk explains about 40% of the disappearing dividends puzzle. Using our second measure, risk attenuates the rate at which the propensity to pay declines from -0.998 to -0.455, and thus explains 54% of the disappearing dividends. Finally, risk reduces the integrated propensity to pay between 1978 and 1999 by about 33%. Based on all three measures, risk explains between 33% and 54% of disappearing dividends.

In Row (3) of Table 2, we incorporate a structural break dummy in addition to a control for risk. The structural break dummy is equal to 1 if the year exceeds 1983 and is zero if the year is between 1978 and 1982. We examine the break variable based on Grullon and Michaely (2002), who argue that there could be a structural shift away from dividends starting in November 1982 when the SEC introduced Rule 10b-18 to provide a safe harbor for firms that repurchase shares. After November 1982, a repurchaser is shielded from liability for manipulation provided that the firm follows procedures about how repurchases are conducted. Not surprisingly, the rule enhanced the popularity of repurchases after 1982. Based on this work, our conjecture is that some part of the disappearing dividends phenomenon can also be attributed to the introduction of Rule 10(b)-18. To test this hypothesis, we control for the 1983 structural break dummy and reestimate each of our three measures of disappearing dividends. Row (3) of Table 2 shows that adding the 1983 structural break more than doubles the portion of disappearing dividends we can explain.

Although not reported to conserve space, we conduct additional robustness checks. The tests in Table 2 are based on a logit model that includes M/B as a control variable in the first stage. We obtain essentially the same results when we exclude M/B from this model. Because technology firms were pervasive in the 1990s, and are likely to be risky, it is also natural to ask whether the link between risk and the propensity to pay is driven by technology firms. To test this hypothesis, we add a technology industry dummy variable to the logit specification. The technology dummy is one if a firm's SIC Code belongs to the technology sector as identified by Loughran and Ritter (2004). We find that the technology dummy has a negative sign and is significant with a Fama and MacBeth (1973) t-statistic ranging from -9.3 to -15.0. However, it has little economic impact on explaining any of the estimates presented above. Hence, the ability of risk to explain disappearing dividends is not driven by an increasing presence of technology firms over time.

4. Disappearing Dividends, Catering, and Risk

Catering theory posits that disappearing dividends can be explained by a behavioral theory rooted in investor fads for dividends. As supporting evidence, BW show that a proxy for fads, the dividend premium, explains 30% of the changes in the propensity to pay dividends. In this section, we revisit the BW analysis. We find that fad proxies matter—mostly, though not always—if we do not control for risk. However, once we control for risk, fads are insignificant and contribute little toward explaining disappearing dividends.

4.1 Propensity to pay adjusted for risk

We follow BW and Fama and French (2001a) in defining the propensity to pay in year t, say p_t, as the actual paying status of each firm i in year t minus the predicted probability of paying, averaged across all sample firms in year t. Following BW, we regress the change in the propensity to pay, $\Delta p_t = p_t - p_{t-1}$, on proxies for investor fads. Table 3 examines this relationship using the dividend premium as the fad proxy. The dividend premium is the log of the year $t-1$ book-value-weighted average M/B of dividend payers minus the log of this same quantity for nonpayers.

Each row in Table 3 reports the results of one time-series regression. As in Table 1, there are 12 rows in all, organized into three panels of four regressions each. Panel A presents results for the full sample from 1963 to 2004, Panel B focuses on the BW period 1963–2000, and Panel C follows Fama and French (2001a) and uses pre-1978 data to fit an out-of-sample logit model, and later data to compute the out-of-sample propensity estimates. As in Table 1, the four regressions in each panel differ according to whether the propensity to pay is computed with controls for risk and M/B. The complete list of variables used in each first-stage logit model is listed in Column 2, titled "Stage 1 Control Variables."[6]

Rows (1) and (2) of Table 3 report estimates of regressions in which the propensity to pay does not control for risk. In these specifications, the dividend premium is 1% significant and the regression R^2 is as high as 30%. These results are similar to those reported in BW. In Rows (3) and (4), the propensity to pay is adjusted for risk in the first-stage logit model. The dividend premium is no longer significant and the regression R^2 is essentially zero. Thus, controlling the propensity to pay for risk eliminates the explanatory power of dividend premium. This result is obtained regardless of whether we control for M/B in the stage 1 logit. Panel B reports similar results for the BW sample period from 1963 to 2000.

The regressions in Panel C of Table 3 are specified differently and are designed to mimic the procedure used by Fama and French (2001a) to document disappearing dividends. Fama-French use the 16-year period prior to 1977 to estimate the logit model and in turn use this fitted model on an out-sample basis to estimate the future propensity to pay from 1978 onward. Accordingly, in Panel C, we estimate propensities to pay from 1978 to 2004 based on the 1962 to 1977 Fama-MacBeth logit estimates. Although the results in the table

[6] The regression start year in Table 3 is 1963 rather than the 1962 start year for the logit models because the LHS variable is the change in the propensity to pay.

Table 3
Catering versus the propensity to pay dividends

Row	Stage 1 Control variables	Catering	Nixon dummy	Adj. R^2	Obs.
		Dependent variable = change in propensity to pay dividends			
Panel A: 1963 to 2004					
(1)	$\frac{\Delta A}{A}$, $\frac{E}{A}$, NYSE%	0.079 (4.16)	0.001 (0.10)	0.333	42
(2)	$\frac{M}{B}$, $\frac{\Delta A}{A}$, $\frac{E}{A}$, NYSE%ile	0.100 (4.47)	−0.039 (−5.32)	0.243	42
(3)	$\frac{\Delta A}{A}$, $\frac{E}{A}$, NYSE%, Risk	−0.015 (−0.22)	0.061 (1.29)	−0.005	42
(4)	$\frac{M}{B}$, $\frac{\Delta A}{A}$, $\frac{E}{A}$, NYSE%, Risk	0.001 (0.01)	0.038 (0.95)	−0.026	42
Panel B: 1963 to 2000					
(5)	$\frac{\Delta A}{A}$, $\frac{E}{A}$, NYSE%	0.081 (4.28)	0.003 (0.22)	0.391	38
(6)	$\frac{M}{B}$, $\frac{\Delta A}{A}$, $\frac{E}{A}$, NYSE%	0.102 (4.72)	−0.038 (−5.18)	0.284	38
(7)	$\frac{\Delta A}{A}$, $\frac{E}{A}$, NYSE%, Risk	−0.014 (−0.20)	0.056 (1.17)	−0.018	38
(8)	$\frac{M}{B}$, $\frac{\Delta A}{A}$, $\frac{E}{A}$, NYSE%, Risk	0.001 (0.02)	0.033 (0.83)	−0.037	38
Panel C: FF (2001) out-of-sample test					
(9)	$\frac{\Delta A}{A}$, $\frac{E}{A}$, NYSE%	0.033 (0.90)		−0.043	27
(10)	$\frac{M}{B}$, $\frac{\Delta A}{A}$, $\frac{E}{A}$, NYSE%	0.079 (1.58)		0.010	27
(11)	$\frac{\Delta A}{A}$, $\frac{E}{A}$, NYSE%, Risk	−0.034 (−0.19)		−0.082	27
(12)	$\frac{M}{B}$, $\frac{\Delta A}{A}$, $\frac{E}{A}$, NYSE%, Risk	−0.012 (−0.07)		−0.083	27

The table reports time-series regression coefficients with Newey-West t-statistics (two lags) in parentheses. There is one observation per year. The dependent variable is the change in the propensity to pay dividends. The propensity to pay equals the difference between the actual fraction of firms paying dividends in a given year and the expected fraction paying dividends, which is equal to the average predicted value from the logit models estimated in Table 1. The control variables used in this logit model are summarized below in the Stage 1 control variables column (described in detail in Section 2) and the related logit estimates are reported in Table 1. The independent variable, the dividend premium, is the logarithmic difference of the previous year asset-weighted-average market-to-book ratio for dividend-paying firms minus the same ratio for nondividend-paying firms. The Nixon dummy is equal to one for years 1972 to 1974 and is zero otherwise. Panels A and B report in-sample regressions in which the logit models used to compute the propensity to pay are estimated over the same period in which the changes in the propensity to pay are regressed on dividend premium. Panel C reports an out-of-sample test (Fama and French 2001) in which logit models are fitted to data from 1963 to 1977. Propensities for 1978 and later are computed using the out-of-sample prior period logit coefficients. Panel C reports results through 2004, although results are similar if we end the sample in 2000.

are reported for the time period ending in 2004, we find similar results if the time period ends in 1999 (as in Fama and French) or 2000 (as in BW).

Panel C of Table 3 indicates that catering matters little in explaining the disappearing dividends puzzle as characterized by Fama and French (2001a). Rows (9) and (10) show that the dividend premium is far less significant in Panel C than in Panel A or B when no control for risk is included. In particular, even without risk controls, we find that the dividend premium does not matter if we exclude M/B in stage one, and it is borderline significant ($p = 0.11$) with a marginal R^2 when we include M/B. Rows (11) and (12) indicate that this faint trace of significance is entirely eliminated when we control for risk.[7]

4.2 Other proxies for dividend fads

In Section 4.1, we follow BW in using the dividend premium as a proxy for dividend fads. In this section, we consider three other proxies for prodividend fads. Two are examined by BW, and we further consider a third: the average announcement return of dividend initiating firms. The last variable is interesting because it directly measures the benefits firms might achieve by catering to prodividend fads. Furthermore, unlike a long-term "level" variable such as the dividend premium, it is a return variable and is measured over just three days, so it is less likely to be contaminated by complex asset pricing considerations.[8]

Examining alternative proxies for fads is useful not only to establish robustness but also to address the awkwardness of using M/B as a growth proxy in the first-stage specification (the Fama and French 2001a logit) and as a fad proxy in the second stage (BW's primary empirical test). The corporate finance literature has routinely used M/B as a proxy for growth opportunities for at least two decades.[9] Thus, most authors interpret an interpretation of M/B as a growth proxy, making it difficult to cleanly interpret M/B as reflecting dividend fads. BW are not unaware of this difficulty. One possibility suggested in BW (p. 274) is that one could exclude M/B from the logit model and just use it in stage 2 as a fad proxy. This cherry picking of one interpretation seems arbitrary. Furthermore, it is statistically problematic as it omits a variable already known to be significant in the Fama-French logit model. These challenges motivate our search for other fad proxies, and also our alternative tests of catering that do not depend on fad proxies. We pursue both lines of examination.

Our first two alternative fad proxies are suggested and employed by BW. One is the weighted average discount of closed-end funds. The discounts on closed-end funds have a broad interpretation as reflecting the sentiments of individual investors. The other measure is an index proposed by BW, which factors in other variables, such as IPO issuing activity and volume in addition to the dividend premium. One issue with these proxies is that even if they measure sentiment, an issue that the literature does not necessarily agree on (Footnote 2), it still does not follow that these general sentiments translate into specific fads

[7] We conduct further tests of robustness in unreported tests. First, we estimate idiosyncratic risk as each firm's residual volatility after accounting for market and industry volatility, in the spirit of Campbell, Lettau, Malkiel, and Xu (2001). Second, we exclude returns for the 10 days surrounding the October 1987 stock market crash. Third, we analyze risk measured from weekly returns rather than from daily returns. In all cases, our results are similar: catering is insignificant once we control for risk.

[8] Because dividend premium is the difference in the log prices (scaled by book value) of payers and nonpayers, it could impound first-order pricing effects, such as expected long-term cash-flow growth and discounts due to systematic risk exposure.

[9] We also note that the Jensen (1986) "free cash-flow" interpretation of M/B falls under the growth umbrella. Companies with high free cash flow have fewer growth opportunities and low M/B according to the free cash-flow literature.

Table 4
Sentiment versus the propensity to pay dividends

Dependent variable = change in propensity to pay dividends

Row	Stage 1 Control variables	Closed end discount	Sentiment index	Initiator announce index	Nixon dummy	Adj.R^2	Obs
Panel A: No Controls for Risk							
(1)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%	0.002			−0.030	0.220	42
		(3.14)			(−3.56)		
(2)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%		−0.017		−0.020	0.278	42
			(−4.08)		(−3.30)		
(3)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%			−0.328	−0.016	−0.005	42
				(−0.97)	(−2.81)		
Panel B: Control for Risk							
(4)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%, Risk	0.000			0.037	−0.026	42
		(0.06)			(1.10)		
(5)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%, Risk		−0.001		0.038	−0.025	42
			(−0.16)		(1.16)		
(6)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NYSE%, Risk			−0.570	0.035	−0.004	42
				(−1.15)	(1.03)		

The table reports time-series regression coefficients with Newey-West t-statistics (two lags) in parentheses. There is one observation per year. The dependent variable is the change in the propensity to pay dividends between the current and prior year. The propensity to pay is the difference between the actual fraction of firms paying dividends in a given year and the expected fraction paying dividends, which is equal to the average predicted value from the logit models presented in Table 1. The control variables used in this logit model are summarized below in the Stage 1 control variables column, and are described in detail in Section 2. We report three specifications with different proxies for sentiment. The Closed-End Discount is the one-year lagged average closed end mutual fund discount in the previous year. The Sentiment Index is the one-year lagged Baker and Wurgler (2004a, 2004b) sentiment index from the previous year. The initiator announce index is the one-year lagged average 3-day abnormal announcement return (using the market model) for initiations in the previous year. The Nixon dummy is equal to one for years 1972 to 1974 and is zero otherwise.

for dividends. For now, we adopt a purely empirical approach and incorporate this assumption as part of the null hypothesis. Under the joint hypothesis that the BW sentiment measures express fads for dividends and that fads matter in explaining dividend policy, we test whether these measures explain changes in the propensity to pay. Rows (1) through (4) in Table 4 report the results of this exercise.

As in Section 4.1, we first estimate the Fama and French (2001a) logit models and compute the aggregate propensity to pay across firms. We then regress changes in the propensity to pay on the sentiment indexes. For both sentiment indexes, our results are remarkably similar to those in Section 4.1. Panel A of Table 4 shows that the two sentiment indexes explain 22.0% and 27.8% of the changes in the propensity to pay. Panel B shows that when we include controls for risk, the importance of both nondividend-specific sentiment indexes vanishes.

Our third proxy for fads likely reflects sentiments that are specific to dividends, viz., dividend initiation announcement returns. BW argue that initiation announcement effects are the means through which dividend-hungry investors can make themselves heard by managers. In fact, announcement effects are at the heart of catering theory, which argues that firms cater to reap valuation gains from catering. We measure the initiation announcement effect as the market model residual from day −1 to day +1. The initiator announcement index for year t is the average of all initiation announcement returns in the previous year $t-1$. Rows (5) and (6) of Table 4 examine whether this variable can explain changes in the propensity to pay dividends. We find that the initiator announcement index is insignificant, and that this result is invariant to whether risk controls are included in stage 1. In fact, the initiation announcement fad proxy has a slightly negative coefficient as opposed to the positive coefficient predicted by catering theory.[10] We obtain similar results for the Fama and French (2001a) and BW sample subperiods.

4.3 Systematic risk and catering

In the logit specifications of Table 1, the controls for risk include both systematic and idiosyncratic risk. Our choice reflects the fact that from a corporate finance perspective, both risks could drive the decision to pay dividends, and hence explain disappearing dividends. However, to explain why controlling for risk should explain any relationship between changes in the propensity to pay and catering proxies, this dichotomy becomes more interesting. The BW catering proxy (the dividend premium) is essentially a price variable, as it is equal to the log M/B difference between payers and nonpayers. Traditional asset pricing theory asserts that prices should be driven by systematic risk, and not idiosyncratic risk. Hence, the traditional theory also suggests that the role of the dividend premium should be explained by systematic—rather than idiosyncratic—risk.

We investigate the importance of systematic risk in explaining why dividend premium matters. In the logit models in Table 1, we estimate specifications that control for systematic risk *alone*. If systematic risk drives the BW relation, controlling for it should explain much of the explanatory power of dividend premium. We find that this is indeed the case. Once we control for systematic risk, the coefficient for dividend premium in regressions similar to those in Table 3 has an insignificant coefficient close in magnitude to zero. As these results add little to what we already report in Tables 1 and 3, we do not report them here.[11]

4.4 Characterizing the omitted variable bias

Our evidence suggests that the BW relation between the dividend premium and changes in the PTP arises because risk is omitted from the model for PTP. This section examines the omitted variable bias theoretically, by deriving an exact expression for the bias in the setting of a linear model for PTP.

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[10] In unreported tests, we find that the lack of a significant relationship between initiation announcement returns and dividend propensity is robust to using median announcement effects instead of means, and to value weighting the announcement effects.

[11] Results available from the authors upon request.

If P_t denotes the vector of the dividend-paying status of N firms at the end of year t, we write the correctly specified propensity to pay $\text{PTP}_{\text{true},t}$ as the linear model

$$P_t = X_t\beta + S_t\gamma + \text{PTP}_{\text{true},t}, \tag{1}$$

where X_t denotes the Fama and French (2001a) characteristics, S_t denotes risk, and coefficients β and γ are estimated, for instance, using the Fama and MacBeth (1973) method. If S_t is omitted in Equation (1), the propensity to pay $\text{PTP}_{\text{omit},t}$ would be incorrectly estimated as

$$\text{PTP}_{\text{omit},t} = \text{PTP}_{\text{true},t} + Z_t\gamma, \tag{2}$$

where Z_t is the component of S_t orthogonal to the Fama and French variables X_t.[12]

In the stage 2 regression, we average $\text{PTP}_{\text{omit},t}$ cross-sectionally and regress its change ($\Delta\overline{\text{PTP}}_{\text{omit},t}$) on the dividend premium DP_{t-1}, which results in the coefficient

$$\frac{\text{cov}(\Delta\overline{\text{PTP}}_{t,\text{omit}}, DP_{t-1})}{\text{var}(DP_{t-1})} = \frac{\text{cov}(\Delta\overline{\text{PTP}}_{\text{true},t}, DP_{t-1})}{\text{var}(DP_{t-1})} + \gamma\frac{\text{cov}(\Delta\bar{Z}_t, DP_{t-1})}{\text{var}(DP_{t-1})}$$
$$b_{\text{omit}} = b_{\text{true}} + \gamma\alpha, \tag{3}$$

where α is the coefficient when the changes in average risk $\bar{Z}_t$ are regressed on DP_{t-1}.

The intuition behind Equation (3) is straightforward. The bias induced by omitting S_t from Equation (1) is a composite of two effects: the omitted variable's role in stage 1 and its role in stage 2, as reflected in the coefficients γ and α, respectively.

We take the expression in Equation (3) to the data. We estimate PTP from Equation (1) and regress its changes on the dividend premium. The regression coefficient is $b_{\text{true}} = -0.031$ when PTP is adjusted for risk, while using the nonrisk-adjusted PTP gives $b_{\text{omit}} = 0.072$. The difference between the coefficients $b_{\text{omit}} - b_{\text{true}}$ is 0.103. Estimating Equation (1) gives the systematic risk coefficient γ as -25.29, and regressing $\Delta\bar{Z}_t$ on dividend premium DP_{t-1} gives α as -0.0041. The product $\gamma\alpha$ is 0.103 (-25.286×-0.0041), which is exactly equal to the difference $b_{\text{true}} - b_{\text{omit}}$.

4.5 Summary

The results of Section 4 underscore two major points. One, the BW proxies for dividend fads have little incremental power to explain disappearing dividends once we control for risk. This result appears in several specifications, including

[12] If S_t is projected on X_t, we have $S_t = X_t\delta + Z_t$ with Z_t orthogonal to X_t. Equation (1) then gives $P_t = X_t(\beta + \delta\gamma) + Z_t\gamma + \text{PTP}_{\text{true},t} = X_t(\beta + \delta\gamma) + \text{PTP}_{\text{omit},t}$, and Equation (2) follows.

the Fama and French (2001a) out-of-sample approach used to establish disappearing dividends. Two, our results suggest a new interpretation of the BW results. There is nothing fundamentally incorrect about the statistical fact that BW establish, viz., the relation between the changes in the BW propensity to pay and the dividend premium. In fact, we replicate their empirical results using their methods. However, our evidence strongly suggests that their results should be interpreted differently. The BW relation appears to be better interpreted as reflecting the role of risk rather than behaviorally driven fads in explaining disappearing dividends.

5. Other Implications of Catering

Our PTP results are quite strong and robust across multiple specifications. This motivates us to conduct a more thorough investigation of catering. We focus on settings outside the narrow frame of the PTP regressions to obtain out-of-sample evidence from independent datasets.

BW focus on one implication of catering, the link between fads and PTP. However, if firms indeed cater to exploit fad-induced misvaluation, two other implications follow immediately. One, caterers exploiting misvaluation should have negative returns in the long run as fad-based misvaluation corrects. Two, to the extent that fads are driven by small investors, caterers should see an increase in ownership by individual retail investors after they cater. This section tests both predictions.

5.1 Long-term returns

Long-term returns are the primary means to test semi-strong market efficiency, a subject on which there is extensive prior work. Fama (1998) provides an elegant overview of the findings and the methodological issues in this literature.

There are two techniques for analyzing long-term returns. One is based on buy-and-hold (BH) returns. Barber and Lyon (1997) and Lyon, Barber, and Tsai (1999) extensively analyze this approach. Long-term BH returns are highly nonnormal with excess skewness and kurtosis, making inferences difficult. These problems can be handled by benchmarking against control firms or explicitly adjusting for skewness in the bootstrapped t-statistics. As Fama (1998) and others point out, the BH approach runs into difficulties when BH return horizons overlap across events, which induces cross-sectional correlation in complex forms that are not easily remedied. Fama suggests a simple calendar time procedure to handle overlap. This approach forms portfolios in each month that include all stocks with a past event within the horizon being studied. For instance, in studies of 12-month returns, the portfolio for month t would include all firms that had an event in months $t-1$ through $t-12$. The monthly portfolio return is regressed on standard Fama-French factors and the alpha is used to measure long-term performance.

Over a time span of 42 years, we have thousands of dividend events. We analyze 12- or 36-month horizons for returns for each event, so there is a high degree of calendar time overlap across observations. Accordingly, we focus on and report results based on the calendar time approach here. Each month, we form rolling portfolios whose members comprise firms that changed dividend status in the previous 12 months (for one-year returns) or 36 months (for three-year returns). We regress the portfolio returns on the three Fama and French (1993) factors plus momentum (MKT, SMB, HML, and MOM), and use the regression intercepts to assess long-term performance. Changes in dividend-paying status could occur either because firms initiate dividends or because they omit dividends. We report results for initiators and omitters separately.[13] We directly test catering theory's prediction that the long-term abnormal return of dividend initiators will be negative. The horizon over which these returns are expected to reverse is an empirical question, so we examine both one- and three-year horizons.

Table 5 reports the long-term returns for firms changing dividend-paying status (i.e., initiators and omitters). Initiators exhibit no evidence of negative long-term returns. In fact, the one-year post-initiation return is reliably *positive*, and is roughly 6% over the first year. The three-year horizon return is about 4% (1.3% per year) and is not significant.[14] These positive long-term returns do not square well with, and even contradict, catering theory. For omitters, the long-term returns are −6.6% and −6% for one- and three-year horizons, respectively.

While the negative returns for omitters may reflect the fact that managers of dividend omitters are skilled at market timing, perhaps reflecting catering, this view quickly runs into difficulties. Dividend omissions are samples in which catering is less likely to apply for several reasons. One is that the associated negative announcement effects nullify any potential benefits of catering. Additionally, the limits to arbitrage constraints required for fads to affect prices are less likely to apply when negative sentiments depress prices. Here, the required arbitrage operation involves buying the firms with depressed prices, which is easy to execute for investors not afflicted by fads. Timing the market is also likely to be a low-priority item for managers dealing with the financial and operational difficulties confronting firms about to omit dividends. Finally, firms that cut or omit dividends have poor prior, concurrent, and future stock returns, so it is hard to see where the apparent valuation gains from catering are being reflected in stock prices.

Panel B in Table 5 examines the possibility that long-term returns are negative when prodividend fads are high, perhaps because catering theory applies only

[13] Earlier versions of the paper reported BH returns with p-values using both the control firm pseudo-portfolio and the skewness-adjusted methods. The results are qualitatively similar to the ones discussed in the text.

[14] The event time returns are greater and are 9% and 21%, respectively. This difference across methods is unsurprising and is typical of long-term return studies, as discussed by Fama (1998). These sharper results provide an even greater contradiction of catering theory's predictions.

Table 5
Returns and ownership changes after dividend intiations and omissions

Panel A: Average long-term returns

Row	1-year initiator return	3-year initiator return	1-year omitter return	3-year omitter return
(1)	5.9% (3.16)	1.3% (0.99)	−6.0% (−2.22)	−2.2% (−1.18)

Panel B: Long-term returns of dividend initiators versus sentiment proxies

Row	Return horizon	intercept	High cater dummy	High ann. return dummy	Nixon dummy	adjusted RSQ	Obs.
(1)	12 months	6.265	0.732		−10.405	−0.001	42
		(2.39)	(0.18)		(−2.83)		
(2)	12 months	6.218		0.714	−9.864	−0.001	42
		(2.35)		(0.22)	(−3.53)		
(3)	36 months	0.023	2.955		−2.667	−0.020	42
		(0.02)	(0.99)		(−0.86)		
(4)	36 months	1.191		0.365	−1.001	−0.050	42
		(0.45)		(0.13)	(−0.41)		

Panel C: Changes in institutional ownership

Row	Intercept	Initiate dummy	Initiate dummy x Hi cater	Omit dummy	Omit dummy x Hi cater	Hi cater dummy	Market to book ratio	NYSE %-ile	Obs.
(1)	0.017								57,136
	(4.03)								
(2)	0.016	0.011		−0.026			0.001	−0.001	57,136
	(3.92)	(2.00)		(−4.12)			(1.76)	(−0.08)	
(3)	0.016	0.013	−0.007	−0.023	−0.016	0.000	0.001	−0.001	57,136
	(3.31)	(3.46)	(−0.64)	(−3.46)	(−1.18)	(0.00)	(1.75)	(−0.07)	

Panels A and B report one- and three-year calendar time abnormal returns after dividend initiations and omissions. Calendar time portfolio membership is identified by dividend event firms entering the portfolio in the month after initiation or omission, and then exiting either one or three years later. The monthly returns of these portfolios are then regressed on the standard Fama and French (1993) factors and the alpha is used to measure long-term performance. In Panel B, the annual abnormal returns of these portfolios are regressed on independent variables including a high cater dummy (one if the dividend premium exceeds its median value) and the high announcement return dummy (one if the announcement index exceeds its median value; see Section 4.2). Panel C analyzes ownership changes after dividend initiations and omissions. The dependent variable is the annual change in the percentage of shares held by institutions. One observation is one firm in one calendar year. The initiation dummy is one if a firm initiated dividends during a year. The omissions dummy is one if a firm omitted dividends during a year. The regression also includes interaction terms based on these dummy variables and the high cater dummy. The control variables are as follows. A firm's market-to-book is its total assets, less its book value of equity, plus its CRSP market capitalization, all divided by its book value of equity. A firm's NYSE percentile is the percentile of its market capitalization in the distribution of the market capitalizations of all NYSE firms in the given year.

in these periods. We define high and low fad periods as years in which fad proxies are above or below their median value. Panel B reveals no evidence of negative drifts in the high fad subperiods. Rows (1) and (3) are based on the BW fad proxy (i.e., the dividend premium). We also report, in Rows (2) and (4), evidence based on the initiator announcement index introduced in Section 4.2. There is little evidence of reversals being concentrated in high catering periods in either case. We find similar results even when we classify high fad periods by quartiles rather than medians.

BW also present an interesting analysis of the long-run returns of an arbitrage long/short portfolio that invests long in dividend payers and short in nonpayers. They find that when the dividend premium is high, i.e., payers are more highly valued than nonpayers, the future raw returns of this portfolio are low. In these tests, BW do not control for risk. We reconsider the one-to-three-year-ahead returns adjusted for risk. The raw 1% per month spread drops to a statistically and economically insignificant 0.1% per month, or about 3.5% over three years once we adjust for risk. In any case, our view is that the portfolio results are at best indirect evidence of gains that could potentially exist if firms catered. These tests are thus secondary to more direct tests that examine the long-term returns of firms that do cater. In these direct tests, catering suggests that long-term returns after increases or initiations should be negative, an implication that is overwhelmingly rejected by the data.

5.2 Ownership changes

Catering theory posits that uninformed investors are afflicted by fads. These investors drive up the prices of payers when their prodividend sentiment is high. This upsurge is not immediately reversed because informed investors, who would take the opposite side and sell, face limits to arbitrage. This characterization naturally suggests that retail investors are the drivers of dividend fads. If so, companies that cater to this dividend appetite should experience an increase in individual retail ownership. We test this proposition by examining changes in the ownership of firms that change their dividend-paying status.

It should be pointed out that while catering implies that dividends attract retail investors, other theories in fact make exactly the opposite prediction. The theoretical model of Allen, Bernardo, and Welch (2000) is particularly stark. Dividends are paid in order to attract informed institutions, exactly opposite to catering theory's prediction. From an institutional perspective, Brav and Heaton (2004) also suggest that institutions rather than individuals are more likely to invest in dividend payers due to the prudent man rules put into effect in 1974. From an empirical viewpoint, Grinstein and Michaely (2005) conduct a comprehensive study on institutional ownership and dividend policy between 1980 and 1996. They report that dividend-paying status is positively related to institutional ownership.

We obtain data on institutional ownership from the Thomson Financial 13-F filings data. A firm's yearly percentage institutional ownership is the total holdings reported by all institutions in December of the current year divided by the total shares outstanding for the firm. The change in a firm's institutional ownership in year t is the change in the percent ownership from December of year $t - 1$ to December of year t. We regress changes in aggregate institutional ownership on changes in dividend-paying status. Panel C of Table 5 reports the results.

Our first explanatory variable is a dummy that takes the value of 1 if a firm initiates dividends and is zero otherwise. We also interact this dummy with another dummy indicating whether dividend fads are high, where high fad levels are defined as years in which the dividend premium is above its median value. This latter variable is designed to assess whether any declines in institutional ownership are particularly sharp in years when fads are high. The control variables include firm size and the M/B.

We find no evidence that changes in retail ownership are positively related to dividend initiations. In fact, the evidence points in the opposite direction: institutional (not retail) ownership increases after initiations, even in years with high fad levels. In particular, the initiation dummy is positive and significant in all specifications, and we find no evidence that increases in institutional ownership are different in high fad years, as evidenced by the insignificant high catering dummy interacted with initiations in Row (3) of Table 5. These results indicate that even if small investors afflicted by fads generate misvaluation in dividend-paying stocks, these investors do not seem to act upon this sentiment and buy firms who cater. Of course, these findings could be rationalized by a die-hard catering fan by arguing that institutional investors are afflicted by the same fads as retail investors. Nevertheless, if one associates fads with a behavioral phenomenon driven by small investors (as BW do), catering becomes a less plausible theory for explaining dividends.

6. Other Dividend Decisions

In any given year, the aggregate supply of dividends comes from two sources: (i) companies that already pay dividends; and (ii) companies that newly initiate dividends in the given year. This section studies these two disaggregate sources of dividend supply separately. For brevity and to keep the focus on dividends, we omit discussion of repurchases but note that the results for this sample are similar.

The motivation for studying the two pieces of dividend supply separately is straightforward. Virtually the entire supply of dividends in any one year comes from companies that already pay dividends. However, their dividend choices are not reflected in the pay/no-pay logit estimates. To shed light on the dividend decisions of firms already paying dividends, it is necessary to study these firms separately. We do so in Section 6.1. New dividend initiators account for a very small portion of dividend supply, and we study them for completeness in Section 6.2.

6.1 Firms that already pay dividends

In this section, we examine dividend changes by firms that already pay dividends. The tests are organized as before into two parts. Section 6.1.1 examines the time-series patterns of dividend changes and whether dividend fads explain these. Section 6.1.2 examines long-term returns and institutional ownership after dividend changes.

Table 6
Catering incentive versus the propensity to increase dividends

Panel A: Stage 1 logit model

Dependent variable = dividend paying firm indicator

			Fama-French Variables				
Row	Idiosyncratic risk	Systematic risk	Market to book	Asset growth	Earnings/ assets	NYSE percentile	Observations
(1)				0.382	10.236	1.678	50,554
				(3.42)	(19.68)	(21.98)	
(2)			−0.136	0.467	11.540	1.732	50,554
			(−2.91)	(4.03)	(19.66)	(20.13)	
(3)	−37.906	0.898		0.481	10.148	1.298	50,554
	(−12.33)	(0.07)		(4.59)	(18.23)	(15.23)	
(4)	−36.519	−0.779	−0.087	0.534	10.975	1.344	50,554
	(−12.56)	(−0.06)	(−1.98)	(4.90)	(17.09)	(15.05)	

Panel B: Stage two propensity regressions

Dependent variable = level of the propensity to initiate dividends

Row	Stage 1 Controls	Catering	Pseudo catering	AR(1) term	Nixon dummy	Adj R^2	Obs
Panel A: Propensity to increase dividends							
(1)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NY %ile	0.030			−0.050	−0.031	42
		(0.31)			(−1.24)		
(2)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NY %ile		−0.196		−0.030	0.085	42
			(−1.98)		(−1.30)		
(3)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NY %ile	0.056		0.863	0.080	0.594	42
		(0.44)		(7.02)	(0.49)		
(4)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NY %ile		−0.030	0.848	0.082	0.604	42
			(−0.38)	(7.15)	(0.49)		
(5)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NY %ile, Risk	−0.040			−0.017	−0.039	42
		(−0.36)			(−0.35)		
(6)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NY %ile, Risk		−0.186		−0.016	0.064	42
			(−1.70)		(−0.50)		
(7)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NY %ile, Risk	0.003		0.885	0.088	0.624	42
		(0.03)		(9.08)	(0.85)		
(8)	$\frac{M}{B}, \frac{\Delta A}{A}, \frac{E}{A}$, NY %ile, Risk		−0.068	0.883	0.085	0.638	42
			(−1.08)	(10.08)	(0.81)		

Panel A reports first-stage Fama and MacBeth (1973) logistic regression coefficients with one observation equal to one firm in one year (only firms that were payers in the previous year are included). The dependent variable is one if the firm increased dividends in the given year and is zero otherwise. t-statistics (in parentheses) are based on Newey-West (two lags) standard errors. Independent variables are idiosyncratic risk, systematic risk, market-to-book ratio, asset growth, earnings to assets, and the NYSE percentile to which a firm's market capitalization belongs. These variables are defined in Section 2. Panel B reports time-series models for the propensity to increase dividends (the dependent variable). t-statistics (in parentheses) are based on Newey-West (two lags) standard errors. The independent variable is the dividend premium, which is defined as the book value of asset weighted average market-to-book ratio of payers minus the corresponding average for nonpayers. The pseudo-catering variable is defined similarly based on dividend-paying firms that increase or do not increase dividends in the given year. The Nixon dummy is equal to one for years 1972 to 1974 and is zero otherwise. The propensity to increase is the difference between the actual fraction of firms increasing dividends and the predicted fraction, which is based on Fama and MacBeth averages from the logit model estimated once a year in Panel A. The table also reports the control variables used in the logit models.

6.1.1 Propensity to change dividends. Panel A of Table 6 reports estimates of logit models in which the dependent variable is one if a firm announces a dividend increase in the given year, and is zero otherwise. We report the results

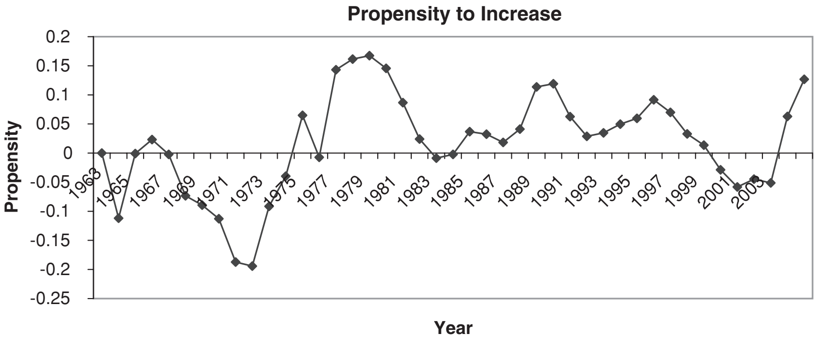

Figure 2
The propensity to increase dividends from 1963 to 2004
The propensity to increase is the difference between the actual fraction of firms increasing dividends in a given year less the "expected" fraction of firms increasing dividends. These calculations are based on the subsample of firms that paid dividends in the previous year. The expected number increasing dividends is equal to the average predicted value from the logistic regressions including the same characteristic variables, as in Fama and French (2001): the M/B, asset growth, earnings divided by assets, and each firm's size percentile relative to NYSE percentile groupings. These variables are defined in Section 2.

for the full sample period from 1963 to 2004. To conserve space, we omit the specifications based on the other sample periods we reported on earlier, all of which give similar findings. As in Table 2, the parameter estimates are Fama and MacBeth (1973) time-series averages of the cross-sectional coefficients.

In the baseline specification in Table 6, we use the same independent variables as in Fama and French (2001a). Profitability, firm size, and asset growth are significantly related to the decision to increase. Asset growth has a positive sign, indicating that payers tend to grow dividends in line with current growth in firm assets. Interestingly, M/B is negative and less significant, suggesting that high *future* growth opportunities only somewhat mitigate the decision to increase dividends. The weaker results for this variable reemphasize the Grullon, Michaely, and Swaminathan (2002) and Allen and Michaely (2003) evidence that future earnings growth is *not* reliably related to the decision to increase dividends. As Figure 2 indicates, there is no obvious trend in the propensity to increase dividends, and in particular, no evident decline in the propensity to increase over the disappearing dividends period.[15]

In Panel B of Table 6, we examine whether the dividend premium explains the time-series propensity to increase dividends. In Row (1), we regress the propensity to increase dividends on the dividend premium and find that dividend premium is not significant. Row (2) repeats this test with a "pseudo-catering" variable. This is the book-value weighted log M/B difference between increasers and nonincreasers rather than the difference between

[15] The results are similar when we include other variables suggested by the dividend literature, such as prior returns (to capture performance improvements associated with dividend changes), dividend yield (Bajaj and Vijh 1990; Lang and Litzenberger 1989; Denis, Denis, and Sarin 1994; and Yoon and Starks 1995), or cash (Lie 2000). None of these variables materially alter coefficients or inferences associated with Table 6.

payers and nonpayers used to construct dividend premium. The "pseudo-catering" variable captures the possibility that firms cater to investor fads for increasers rather than the generalized fads for dividend payers that the BW proxy attempts to measure. It is negative and significant (catering theory predicts a positive coefficient). In unreported results, we find insignificant results for decreasers.

The last two rows of Panel B of Table 6 report estimates of AR(1) models to handle potential overdifferencing in the propensity to increase specification. To motivate the issue, observe that the Fama and French (2001a) payer/nonpayer logit models of Section 3 are used to derive a stock variable, PTP. The first difference in PTP (examined by BW) is a flow variable. The decision to increase is already a flow variable, so innovations in this series could reflect overdifferencing when the true autocorrelation is less than 1.0. Accordingly, the last two rows in Panel B report results for an AR(1) specification. Not surprisingly, the AR(1) term is significant, indicating a heavy autocorrelation of close to 0.85. The dividend premium remains insignificant in the AR(1) model, and Rows (5)–(8) show that the dividend premium also remains insignificant when controls for risk are included.

We close this section by briefly discussing the implications of our results—the insignificance of the dividend premium and the "pseudo-dividend premium"—for catering theory. BW argue quite forcefully that the *insignificance* of the dividend premium for dividend increasers supports catering (see Baker and Wurgler 2004a, p. 1142). On the other hand, Lie and Li (2006) argue that *significance* supports catering. It is unclear what the testable content of catering is when both the significance and the insignificance of a relationship can be interpreted as supportive of catering.

The difference between BW and Lie and Li (2006) comes down to opinions on what drives dividend fads. BW hypothesize that behaviorally biased investors only care about whether firms pay dividends or not. The BW view meets some resistance in Graham and Kumar (2006), who find that individuals have no preference over the dividend-paying status of firms. Likewise, Grinstein and Michaely (2005) argue that institutions have preference over whether firms pay dividends or not but not over dividend levels. Lie and Li, on the other hand, believe that fads apply to dividend levels. Our view is agnostic. Even if fads extend over dividend levels, we find no evidence that fads empirically explain dividend change decisions.[16]

[16] The significance of dividend premium in Lie and Li (2006) contradicts results reported in BW (Baker and Wurgler 2004a, p. 1227, line 3). Curiously, Lie and Li do not explain or reconcile this contradiction. A large part of the difference seems attributable to methodology. While the other papers in the disappearing dividends literature, including Fama and French (2001a), BW, Denis and Osobov (forthcoming), and ours, use Fama and MacBeth (1973) methods to account for panel data issues of clustering and autocorrelation, Lie and Li do not account for these. Using the Lie and Li methods, we find that the dividend premium is significant, but adjusting standard errors for clustering makes the t-statistic insignificant in line with our work and that in BW.

Table 7
Returns and ownership changes after dividend increases and decreases

Panel A: Average long-term returns

Row	1-year increaser return	3-year increaser return	1-year decreaser return	3-year decreaser return
(1)	2.8% (2.64)	2.3% (2.52)	−0.0% (−0.02)	0.5% (0.37)

Panel B: Long-term returns of dividend increasers versus sentiment proxies

Row	Return horizon	Intercept	High cater dummy	High ann. return dummy	Nixon dummy	Adjusted RSQ	Obs.
(1)	12 months	2.634	0.774		−3.275	−0.036	42
		(1.81)	(0.32)		(−0.99)		
(2)	12 months	0.918		3.851	−2.068	0.045	42
		(0.54)		(2.11)	(−0.88)		
(3)	36 months	2.270	0.434		−2.266	−0.042	42
		(1.67)	(0.22)		(−0.84)		
(4)	36 months	0.990		2.749	−1.468	0.013	42
		(0.63)		(1.61)	(−0.70)		

Panel C: Changes in institutional ownership

Row	Intercept	Increase dummy	Increase dummy x hi cater	Decrease dummy	Decrease dummy x hi cater	Hi cater dummy	Market to book ratio	NYSE %-ile	Obs.
(1)	0.017								57,136
	(4.03)								
(2)	0.016	0.001		−0.009			0.001	−0.001	57,136
	(3.86)	(0.51)		(−1.58)			(1.83)	(−0.12)	
(3)	0.016	0.002	−0.001	−0.007	−0.009	0.000	0.001	−0.001	57,136
	(3.27)	(0.66)	(−0.16)	(−1.12)	(−0.80)	(0.02)	(1.81)	(−0.13)	

Panels A and B report one- and three-year calendar time abnormal returns after dividend increases and decreases. Calendar time portfolio membership is identified by dividend event firms entering the portfolio in the month after increase or decrease, and then exiting either one or three years later. The monthly returns of these portfolios are then regressed on the standard Fama and French (1993) factors and the alpha is used to measure long-term performance. In Panel B, the annual abnormal returns of these portfolios are regressed on independent variables including a high cater dummy (one if the dividend premium exceeds its median value) and the high announcement return dummy (one if the announcement index exceeds its median value; see Section 4.2). Panel C analyzes ownership changes after dividend increases and decreases. The dependent variable is the annual change in the percentage of shares held by institutions. One observation is one firm in one calendar year. The increase dummy is one if a firm announced a dividend increase during a year. The decrease dummy is one if a firm decreased dividends during a year. The regression also includes interaction terms based on these dummy variables and the high cater dummy. The control variables are as follows. A firm's market-to-book is its total assets, less its book value of equity, plus its CRSP market capitalization, all divided by its book value of equity. A firm's NYSE percentile is the percentile of its market capitalization in the distribution of the market capitalizations of all NYSE firms in the given year.

6.1.2 Long-term returns and ownership changes. In a manner parallel to the tests of Section 5.1, we examine long-term returns and ownership changes after dividend changes. Table 7 reports the results.

We find little evidence to support catering for the tests of long-term returns in Panel A of Table 7. One- and three-year returns after increases are positive and statistically significant. Although the returns are economically modest at about 2.5%, they are still positive and statistically significant. The returns for decreasers are not significant. Rows (1) through (4) of Panel B find no evidence of negative returns in high fad periods. This result is invariant to whether fads are defined in terms of the dividend premium [Rows (1) and (3)] or increaser announcement effects [Rows (2) and (4)].[17]

Panel C of Table 7 examines changes in institutional ownership. Catering predicts an increase in individual retail ownership for firms that cater, so institutional ownership should decline for these firms. We find that institutional ownership does not change significantly after dividend increases. The coefficient for increases is also positive, and does not square well with the negative value predicted by catering. Row (3) shows that institutional ownership also does not reverse more sharply in periods of high fads.

Catering also has an indirect implication for announcement effects. Specifically, if catering is correct, dividend increase announcement effects should be higher for firms that were paying smaller dividends because these firms should have more to benefit from catering. We find no evidence for this prediction. Announcement returns are higher for firms with *higher* preannouncement dividend yields. The Fama and MacBeth (1973) t-statistic associated with this test is 8.09. This result is robust to the inclusion of controls for size, M/B, and the firm's preannouncement share price.

6.2 Initiations

Initiations represent the second component of dividend supply, although they are economically small. For instance, in our sample, initiations account for less than 1% of the annual dividend flow and around 10% of the change in annual flow. We analyze this component of dividend supply for completeness.

We start with all firms that do not pay a dividend in year $t - 1$ and identify initiators as firms paying dividends in year t. Panel A of Table 8 reports the Fama-MacBeth logit estimates for the probability of initiating a dividend. For simplicity and consistency with prior work, we use the Fama-French explanatory variables and report the full period results for 1963–2004.[18] As in the payer/nonpayer regressions, larger and more profitable firms are more likely to initiate dividends. Interestingly, and in contrast to the payer/nonpayer and dividend increase logit models, *current* asset growth does not matter in the decision to initiate while future growth opportunities (high M/B) make firms less likely to initiate. The results are consistent with the firm maturity view of dividends advocated in the Allen and Michaely (2003) survey. Both idiosyncratic and systematic risk have the predicted negative signs, and both are significant at the 1% level.

Figure 3 displays the aggregate annual propensity to initiate dividends. The evidence suggests that there is a sharp structural break in the time-series around the later 1970s. Prior to this period, the propensity is higher and appears to be considerably more volatile. The series settles and is smoother in the periods thereafter. Formal tests confirm this visual impression. Fitting an AR(1) model,

[17] The evidence for dividend decreasers, not displayed here, is similarly insignificant.

[18] All results in Table 8 are similar when using the different samples and models of Table 1.

Table 8
Dividend premium versus the propensity to initiate dividends

Panel A: Stage one logit model

Dependent variable = dividend initiating firm indicator

Idiosyncratic risk	Systematic risk	Market to book	Asset growth	Earnings/ assets	NYSE percentile	Observations
−44.43	−53.42	−0.45	−0.29	7.33	1.16	75,064
(−6.65)	(−3.55)	(−4.89)	(−1.55)	(8.60)	(3.64)	

Panel B: Stage two propensity regressions

Row	Dependent variable	Dividend premium	AR(1) term	Adj R^2	Obs
(1)	Change in Propensity, 1963–2004	0.025		4.42%	42
		(1.36)			
(2)	Level of Propensity, 1963–2004	0.0799	0.793		42
		(3.10)	(5.61)		
(3)	Level of Propensity, 1963–1977	0.119	0.580		15
		(0.87)	(1.83)		
(4)	Level of Propensity, 1978–2004	0.023	0.895		27
		(0.63)	(9.38)		

Panel A reports first-stage Fama and MacBeth (1973) logistic regression coefficients with one observation equal to one firm in one year (only firms that were not payers in the previous year are included). The dependent variable is one if the firm initiated dividends in the given year and zero otherwise. Independent variables are idiosyncratic risk, systematic risk, the market-to-book ratio, asset growth, earnings to assets, and the NYSE percentile to which a firm's market capitalization belongs. These variables are defined in Section 2. t-statistics (in parentheses) are based on Newey-West (two lags) standard errors. In Panel B, there is one observation per year. The dependent variable is either the level or the change in the propensity to initiate dividends. The propensity to initiate is the difference between the actual fraction of firms initiating dividends in a given year less the expected fraction initiating (based on the Panel A stage one logit model). The independent variable, catering, is the one-year lagged logarithmic difference in the previous year asset-weighted-average market-to-book ratio for dividend-paying firms less that for nondividend-paying firms. The Nixon dummy is equal to one for years 1972 to 1974 and is zero otherwise.

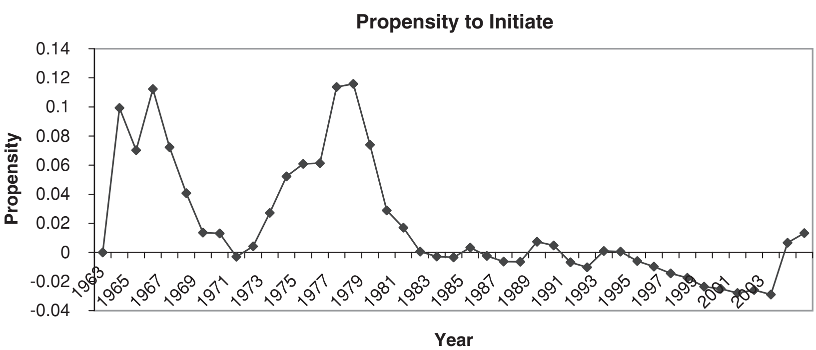

Figure 3
The propensity to initiate dividends from 1963 to 2004
The propensity to initiate is the difference between the actual fraction of firms initiating dividends in a given year less the "expected" fraction of firms initiating dividends. These calculations are based on the subsample of firms that did not pay dividends in the previous year. The expected number initiating dividends is equal to the average predicted value from the logistic regressions including the same characteristic variables, as in Fama and French (2001): the M/B, asset growth, earnings divided by assets, and each firm's size percentile relative to NYSE percentile groupings. These variables are defined in Section 2.

the log-likelihood test rejects the null hypothesis of no break at the 1% level for a break in 1978 (the p-value is of order 10^{-5}). Our results do not change if we define the break around 1979 or 1980, which is the year suggested by the test based on the maximum difference employed by Butler, Grullon, and Weston (2006a). In each case, the null of no structural break is resoundingly rejected at the 1% level.[19]

Panel B of Table 8 examines the relation between the dividend premium and the propensity to initiate. Following Table 3, we start by regressing changes in the propensity to initiate on the dividend premium in Row (1). The dividend premium is not significant. As before, we consider AR(1) models to account for the possibility of overdifferencing in first difference models. Row (2) reports the full period specification. As in BW, the dividend premium is significant. Rows (3) and (4) report the subperiod specifications, which we examine given the overwhelming evidence of a structural break. We find that the significance of the dividend premium entirely vanishes. The coefficient is higher in the first subperiod, but drops to a fifth of its value in the second period, which of course is the period of interest from the viewpoint of the disappearing dividends literature. Our evidence provides one more illustration of how structural breaks can lead to apparently significant predictive relationships when none actually exist, a point made in Butler, Grullon, and Weston (2006a) and emphasized further in Butler, Grullon, and Weston (2006b). We conclude that the dividend premium does not explain initiations.

6.3 Repurchases and total payout

Our tests thus far have concentrated on dividends, but firms could also pay out cash to their shareholders via share repurchases. Repurchases are economically important, as pointed out by Allen and Michaely (2003), who cite the surge in repurchases as one of the six major facts about dividend policy. A question of natural interest is whether we obtain similar results when considering share repurchases or total payouts rather than dividends alone. To investigate this issue, we identify repurchases either from Securities Data Company announcements or from the Compustat-based algorithm suggested by Grullon and Michaely (2002). These time-series begin in 1980 and 1971, respectively, when each data source of repurchases becomes available. In tests that parallel those for dividends, we find that risk has the expected negative sign, but matters less for repurchases than for dividends.[20] There is little evidence that the dividend premium or analogous "pseudo-premium" variables for repurchases (or total payouts) are significant, nor is there evidence of any return reversals

[19] The existence of such a break is perhaps not surprising in view of the macroeconomic fluctuations in the 1970s pointed out by Butler et al.—the oil price shock, the related price controls, the Nixon dividend freeze and its aftermath rebound, the Paul Volcker monetary policy targeting—and, more mechanically, the entry of NASDAQ firms.

[20] The evidence is consistent with the view that dividends constitute an intrinsic precommitment (Lintner 1956), while repurchases tend to be more flexible, as suggested by Jagannathan, Stephens, and Weisbach (2000).

Table 9
Time-series regressions of changes in catering versus risk factor returns

Dependent variable = changes in catering

Row	HML Factor returns	SMB factor returns	MKT factor returns	MOM factor returns	Adj. R^2	Observations
(1)	0.404				0.226	43
	(3.97)					
(2)		−0.436			0.303	43
		(−4.71)				
(3)			−0.230		0.099	43
			(−2.42)			
(4)				−0.168	0.008	43
				(−1.03)		
(5)	0.386	−0.421			0.518	43
	(4.62)	(−5.31)				
(6)	0.307	−0.445	−0.056	−0.204	0.535	43
	(3.61)	(−5.19)	(−0.11)	(−1.61)		

The table reports OLS time-series regression coefficients with Newey-West (robust to two lags) t-statistics in parentheses. One observation is one year, and the dependent variable is the change in catering (i.e., the dividend premium in year t minus the dividend premium in year $t-1$). The dividend premium is the logarithmic difference of the previous year asset-weighted-average market-to-book for dividend-paying firms less that for nondividend-paying firms. The independent variables include the returns of the three Fama and French (1993) factors (HML, SMB, and MKT) plus the momentum factor (MOM).

as predicted by catering theory. To conserve space and because of our focus on dividends, we do not report these results.

7. Interpreting the dividend premium

The catering variable in Baker and Wurgler (2004a, 2004b) is the dividend premium, the logarithmic difference in the market-to-book ratios of dividend-paying and nondividend-paying firms. At least as part of a null hypothesis, it seems plausible that investors have transient fads for dividend payers. These effects would show up as periodic surges in dividend payer valuation. However, neoclassical finance suggests that stock prices also vary due to more orthodox reasons, such as risk and cash flows. In this section, we explore whether these traditional interpretations of the dividend premium variable have empirical support.

7.1 Risk

The dividend premium variable is not neutral with respect to the conventional Fama and French (1993) risk factors. Table 9 presents a regression of changes in the BW catering variable on the Fama and French risk factors HML, SMB, MKT, and momentum (MOM). In the individual regressions, the coefficients for MKT, SMB, and HML are all significant. In multiple regression, the market and momentum coefficients are not significant, indicating that these two dimensions equate across payers and nonpayers. However, the other two factors, HML and SMB, remain important and have an economically significant adjusted R^2 of 52%. The regression coefficient on HML is positive,

Table 10
Changes in dividend and earnings supply versus catering

Row	Variable name	Catering	Nixon dummy	Durbin Watson	R^2	Observations
Panel A: Dependent variable = changes in earnings differential						
(1)	Changes in dollar cashflow differential	0.494	0.005	1.962	0.272	41
		(5.20)	(0.14)			
(2)	Changes in real cashflow differential	0.506	−0.021	1.976	0.265	41
		(5.37)	(−0.67)			
Panel B: Dependent variable = changes in dividend supply						
(3)	Changes in dollar dividends	0.214	−0.029	1.756	0.220	41
		(3.96)	(−1.26)			
(4)	Changes in real dividends	0.226	−0.055	1.975	0.236	41
		(4.36)	(−3.43)			
Panel C: Dependent variable = changes in dividend and payout yield						
(5)	Changes in dividend yield	−0.012	0.203	2.022	0.075	41
		(−0.07)	(1.63)			
(6)	Changes in payout yield	−0.327	0.360	2.633	0.114	33
		(−1.05)	(2.93)			

The table reports OLS time-series regression coefficients with Newey-West (robust to two lags) t-statistics in parentheses. One observation is one year, and the dependent variables are logarithmic changes in aggregate dividends, aggregate cash flows of payers less nonpayers, payout yields, and payout ratios (varies by panel). Nominal figures are in actual dollars, and real figures are adjusted by the Consumer Price Index. Changes in aggregate dividend supply (Panel A) are the logarithmic difference of the total dollar dividends paid by all firms in year t versus year $t-1$. Changes in aggregate cash-flow differential (Panel B) are the logarithmic difference of the total dollar earnings summed over dividend payers less the dollar earnings summed over nonpayers in year t versus year $t-1$. Changes in the dividend yield (payout yield) (Panel C) are the logarithmic difference of the dollar dividend (dollar dividends plus repurchases) divided by the total market value summed over all firms in year t versus year $t-1$. The independent variable, catering, is the one-year lagged logarithmic difference of the previous year asset-weighted-average market-to-book ratio for dividend-paying firms less that for nondividend-paying firms. The Nixon dummy is equal to one for years 1972 to 1974 and is zero otherwise.

suggesting that the catering variable loads on high book-to-market value firms. The regression coefficient on SMB is negative, suggesting that the portfolio also loads on large firms. Thus, the dividend premium behaves like a portfolio of large firms with few growth prospects. Our results suggest that these risk dimensions drive the relationship between the dividend premium and dividend payer status.

7.2 Cash flow

Table 10 analyzes the potential cash-flow dimensions of the dividend premium. The idea behind this analysis is fairly simple. The relative value of dividend and nondividend-paying stocks could reflect information about the future cash flows of these two types of stocks. For instance, if the cash flows of dividend payers are expected to increase, the market value of dividend payers will increase (before the cash-flow increases are realized). The book value will not increase until all of the expected future cash-flow increases are finally realized. Thus, if the cash flows of dividend payers are expected to increase, the M/B of these firms will rise. It is straightforward to extend this argument to the relative value of dividend and nondividend payers: when the difference in M/B increases (i.e., the dividend premium increases), it is likely that the relative expected cash-flow growth of payers relative to nonpayers will also do so.

Table 10 tests whether the payer versus nonpayer value differential predicts the future earnings growth of dividend payers relative to nonpayers. Panel A reports a regression in which the dependent variable is the differential in one-year earnings growth between payers and nonpayers. We observe a significant relation between the two with an R^2 of 26%–27%. In Panel B, the dependent variable is the logarithmic difference between the time $t + 1$ dividend supply and the time t dividend supply. Dividend supply is the total dollar dividends paid by all firms in the given year, and because only dividend payers pay dividends, it is also accurate to name this the growth in the dividend supply of payers. This variable is significantly related to the dividend premium at time t with an R^2 of about 22%–24%.

Panel C of Table 10 analyzes changes in the dividend payout ratio. The question at hand is whether the dividend growth in Panel B goes beyond the levels suggested by the earnings growth in Panel A. The table shows that there is little if any relationship between the dividend premium and future payout ratios, and if anything, the relationship is negative. Thus, the dividend premium shows no ability to predict aggregate dividends beyond the earnings information aggregated by prices. We conclude that the dividend premium is related to fundamentals, such as risk and cash flow, as it should when prices aggregate information about risk and cash flow in keeping with traditional finance. It does not have a behavioral interpretation free of these neoclassical considerations.

8. Conclusion

Fama and French (2001a) show that the propensity to pay dividends has declined over time, a fact that they term the "disappearing dividends" puzzle. We investigate this puzzle through the lens of risk, and find that risk is important in explaining the dividend-paying status of firms. Risk has economic effects comparable to any other variable used to explain dividend-paying status. Our evidence suggests that risk explains between one-third and one-half of the Fama and French disappearing dividends puzzle.

We find little support for the view that dividends appear and disappear because firms "cater" to dividend fads. The major proxy for dividend fads, the dividend premium, explains the changing propensity to pay dividends—if we do not control for risk. Once we control for risk, this relationship vanishes. We obtain similar results using other fad proxies, and in various subsamples. We emphasize that there is nothing empirically incorrect about the relationship that Baker and Wurgler (2004a, 2004b) establish between the dividend premium and the changes in the Fama and French propensity to pay dividends. However, our evidence suggests a different interpretation for their results. BW view their results as supportive of fads driving dividend policy. Our evidence suggests that the dividend premium matters in BW not because it reflects behavioral fads but rather because it acts as a proxy for risk.

We explore the robustness of our findings outside the propensity to pay framework by examining catering theory's predictions regarding long-term return reversals and retail ownership after dividend events. Our results do not square well with the predictions of catering theory. Long-term returns are unambiguously positive, and institutional (not retail) ownership increases following dividend initiations. We also investigate the role of catering in firms already paying dividends, which account for 99% of the annual supply of dividends. We find little evidence that fads matter here or in a broader vector of payout decisions covering the most significant portions of the aggregate payout supply.

We do *not* view our analysis as ruling out all behavioral explanations for dividends. However, our analysis does point to a substantial hurdle in constructing clean proxies for behavioral factors not "contaminated" by neoclassical considerations, such as risk and cash flows. The dividend premium used by BW is based on M/B and is thus a price variable. Neoclassical asset pricing theory asserts that prices fluctuate when cash flows are expected to grow and when assets are exposed to varying levels of systematic risk. We find that the dividend premium is related quite reliably to both neoclassical sources of variation. Hence, its use as a clean empirical proxy for fads seems questionable. In our view, behavioral factors could matter, but disentangling their effect with reliable proxies or other experiments continues to be an interesting challenge.

References

Aharony, J., and I. Swary. 1980. Quarterly Dividend and Earnings Announcements and Stockholders' Returns: An Empirical Analysis. *Journal of Finance* 35:1–12.

Allen, F., A. Bernardo, and I. Welch. 2000. A Theory of Dividends Based on Tax Clientele. *Journal of Finance* 55:2499–536.

Allen, F., and R. Michaely. 2003. *Handbook of the Economics of Finance: Payout Policy*. Elsevier North Holland.

Amihud, Y., and K. Li. 2006. The Declining Information Content of Dividends and the Effects of Institutional Investors. *Journal of Financial and Quantitative Analysis*.

Asquith, P., and D. Mullins. 1983. The Impact of Initiating Dividend Payments on Shareholders' Wealth. *Journal of Business* 56:77–96.

Bajaj, M., and A. Vijh. 1990. Dividend Clienteles and the Information Content of Dividend Changes. *Journal of Financial Economics* 26:193–219.

Baker, M., and J. Wurgler. 2004a. Appearing and Disappearing Dividends: The Link to Catering Incentives. *Journal of Financial Economics* 73:271–88.

Baker, M., and J. Wurgler. 2004b. A Catering Theory of Dividends. *Journal of Finance* 59:1125–165.

Barber, B. M., and J. D. Lyon. 1997. Detecting Long-Run Abnormal Stock Returns: The Empirical Power and Specification of Test Statistics. *Journal of Financial Economics* 43:341–72.

Benartzi, S., R. Michaely, and R. Thaler. 1997. Do Dividend Changes Signal the Future or the Past? *Journal of Finance* 52:1007–34.

Berk, J., and R. Stanton. 2007. Managerial Ability, Compensation, and the Closed-End Fund Discount. *Journal of Finance* 62:529–56.

Brandt, M., A. Brav, and J. Graham. 2005. The Idiosyncratic Volatility Puzzle: Time Trend or Speculative Episodes? Working paper, Duke University.

Brav, A., J. Graham, C. Harvey, and R. Michaely. 2005. Payout Policy in the 21st Century. *Journal of Financial Economics* 77:483–527.

Brav, A., and J. B. Heaton. 2004. Did ERISA's Prudent Man Rule Change the Price of Dividend Omitting Firms? Working paper, Duke University.

Butler, A., G. Grullon, and J. Weston. 2006a. Can Managers Forecast Aggregate Returns? *Journal of Finance* 60:963–86.

Butler, A., G. Grullon, and J. Weston. 2006b. A Note on Nonsense Predictive Regressions Arising out of Structural Breaks. Working paper, Rice University.

Campbell, J., M. Lettau, B. Malkiel, and Y. Xu. 2001. Have Individual Stocks Become More Volatile? An Empirical Exploration of Idiosyncratic Risk. *Journal of Finance* 56:1–43.

Campbell, J., and J. Taksler. 2003. Equity Volatility and Corporate Bond Yields. *Journal of Finance* 58:2321–49.

Charest, G. 1978. Dividend Information, Stock Returns, and Market Efficiency. *Journal of Financial Economics* 6:297–330.

Chen, N., R. Kan, and M. Miller. 1993a. Are the Discounts on Closed-End Funds a Sentiment Index? *Journal of Finance* 48:795–800.

Chen, N., R. Kan, and M. Miller. 1993b. Are the Discounts on Closed-End Funds a Sentiment Index? A Rejoinder. *Journal of Finance* 48:809–10.

Chetty, R., and E. Saez. 2005. Dividend Taxes and Corporate Behavior: Evidence from the 2003 Tax Cut. *Quarterly Journal of Economics* 120:791–833.

Chopra, N., C. Lee, A. Shleifer, and R. Thaler. 1993a. Yes, Discounts on Closed-End Funds Are a Sentiment Index. *Journal of Finance* 48:801–808.

Chopra, N., C. Lee, A. Shleifer, and R. Thaler. 1993b. Yes, Discounts on Closed-End Funds Are a Sentiment Index: Summing Up. *Journal of Finance* 48:811–12.

DeAngelo, H., L. DeAngelo, and D. Skinner. 2004. Are Dividends Disappearing? Dividend Concentration and the Consolidation of Earnings. *Journal of Financial Economics* 72:425–56.

Denis, D., D. Denis, and A. Sarin. 1994. The Information Content of Dividend Changes: Cash Flow Signaling, Overinvestment, and Dividend Clienteles. *Journal of Financial and Quantitative Analysis* 29:567–87.

Denis D., and I. Osobov. 2008. Why do firms pay dividends? International evidence on the determinants of dividend policy. *Journal of Financial Economics* 89:62–82.

Durnev, A., R. Morck, and B. Yeung. 2003. Does Greater Firm-Specific Return Variation Mean More or Less Informed Stock Pricing? *Journal of Accounting Research* 41:797–836.

Eades, K. 1982. Empirical Evidence on Dividends as a Signal of Firm Value. *Journal of Financial and Quantitative Analysis* 17:471–500.

Elton, E., M. Gruber, and J. Busse. 1998. Do Investors Care about Sentiment? *Journal of Business* 71:477–500.

Fama, E. 1998. Market Efficiency, Long-term Returns, and Behavioral Finance. *Journal of Financial Economics* 49:283–306.

Fama, E., and K. French. 1993. Common Risk Factors in Stock and Bond Returns. *Journal of Financial Economics* 33:3–56.

Fama, E., and K. French. 2001a. Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay? *Journal of Financial Economics* 60:3–44.

Fama, E., and K. French. 2001b. New Lists: Fundamentals and Survival Rates. *Journal of Financial Economics* 73:229–69.

Fama, E., and J. MacBeth. 1973. Risk, Return, and Equilibrium: Empirical Tests. *Journal of Political Economy* 71:607–36.

Fink, J., K. Fink, G. Grullon, and J. Weston. 2006. Firm Age and Fluctuations in Idiosyncratic Risk. Working paper, Rice University.

Graham, J., and A. Kumar. 2006. Do Dividend Clienteles Exist? Evidence on Dividend Preferences of Retail Investors. *Journal of Finance* 61:1305–336.

Grinstein, Y., and R. Michaely. 2005. Institutional Holdings and Payout Policy. *Journal of Finance* 60:1389–426.

Grullon, G., and R. Michaely. 2002. Dividends, Share Repurchases, and the Substitution Hypothesis. *Journal of Finance* 57:1649–84.

Grullon, G., R. Michaely, and B. Swaminathan. 2002. Are Dividend Changes a Sign of Firm Maturity? *Journal of Business* 75:378–424.

Healy, P., and K. Palepu. 1988. Earnings Information Conveyed by Dividend Initiations and Omissions. *Journal of Financial Economics* 21:149–76.

Jagannathan, M., C. Stephens, and M. Weisbach. 2000. Financial Flexibility and the Choice Between Dividends and Stock Repurchases. *Journal of Financial Economics* 57:355–84.

Jensen, M. 1986. Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review* 76:323–29.

Julio, B., and D. Ikenberry. 2004. Reappearing Dividends. *Journal of Applied Corporate Finance* 16:89–100.

Koch, A., and A. Sun. 2004. Dividend Changes and the Persistence of Past Earnings Changes. *Journal of Finance* 59:2093–116.

Lang, L. H. P., and R. Litzenberger. 1989. Dividend Announcements, Cash Flow Signaling vs. Free Cash Flow Hypothesis. *Journal of Financial Economics* 24:181–92.

Lee, C., A. Shleifer, and R. Thaler. 1991. Investor Sentiment and the Closed-End Fund Puzzle. *Journal of Finance* 46:75–109.

Lie, E. 2000. Excess Funds and Agency Problems: An Empirical Study of Incremental Disbursements. *Review of Financial Studies* 13:219–48.

Lie, E., and W. Li. 2006. Dividend Changes and Catering Incentives. *Journal of Financial Economics* 80:293–308.

Lintner, J. 1956. Distribution of Incomes of Corporations Among Dividends, Retained Earnings, and Taxes. *American Economic Review* 46:97–113.

Loughran, T., and J. Ritter. 2004. Why Has IPO Underpricing Changed Over Time? *Financial Management* 33:5–37.

Lyon, J. D., B. M. Barber, and C. L. Tsai. 1999. Improved Methods for Tests of Long-Run Abnormal Stock Returns. *Journal of Finance* 54:165–201.

Malkiel, B., and Y. Xu. 2003. Investigating the Behavior of Idiosyncratic Volatility. *Journal of Business* 76:613–44.

Michaely, R., R. Thaler, and K. Womack. 1995. Price Reactions to Dividend Initiations and Omissions: Overreaction or Drift? *Journal of Finance* 2:573–608.

Pastor, L., and P. Veronesi. 2003. Stock Valuation and Learning about Profitability. *Journal of Finance* 58:3–35.

Qiu, L., and I. Welch. 2005. Measuring Investor Sentiment? Working paper, Brown University and NBER.

Venkatesh, P. C. 1989. The Impact of Dividend Initiation on the Information Content of Earnings Announcements and Returns Volatility. *Journal of Business* 62:175–97.

von Eije, H., and W. Megginson. Forthcoming. Dividend Policy in the European Union. *Journal of Financial Economics*.

Yoon, P. S., and L. Starks. 1995. Signaling, Investment Opportunities, and Dividend Announcements. *Review of Financial Studies* 8:995–1018.