Corporate Dividend Policies: Lessons from Private Firms

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We compare the dividend policies of publicly and privately held firms in order to help identify the forces shaping corporate dividends, and shed light on the behavior of privately held companies. We show that private firms smooth dividends significantly less than their public counterparts, suggesting that the scrutiny of public capital markets plays a central role in the propensity of firms to smooth dividends over time. Public firms pay relatively higher dividends that tend to be more sensitive to changes in investment opportunities than otherwise similar private firms. Ultimately, ownership structure and incentives play key roles in shaping dividend policies. (*JEL* G35, G32, G15)

Miller and Modigliani (1961) show that dividend policy is irrelevant for firm value when markets are "perfect" and investment is held constant. However, both empirical evidence (e.g., Allen and Michaely 2003) and survey evidence (Lintner 1956; Brav et al. 2005) suggest that dividend policy is anything but irrelevant to managers and markets. Rather, corporate dividend policies exhibit clear patterns. In particular, dividends are "smoothed" and not often decreased, and investors react positively to dividend increases and negatively to dividend decreases (e.g., Benartzi et al. 1997). While these stylized facts are well established, the economic mechanism behind these facts—that is, how and why firms decide on a particular dividend policy—is not well understood despite an abundance of empirical evidence.

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The goal of this article is to shed new light on the forces responsible for shaping dividend policy by comparing the dividend behavior of publicly held firms with that of privately held firms in the United Kingdom. This approach enables us to make two contributions to the existing literature on corporate dividend policy. First, we examine the extent to which Lintner's evidence of dividend smoothing is related to whether firms are publicly traded. Second, we provide general insight into the dividend policies of private firms, which have largely been ignored despite their importance to the economy.[1] An important by-product of our strategy is that by using data from the United Kingdom, we not only overcome the obstacle of obtaining a large sample of financial data on privately held firms, but also examine firms in an economic environment that shares many similarities to that found in the United States.[2]

We begin by highlighting the differences between public and private firms, focusing attention on the differences in corporate governance and the diversity of ownership structures encountered among private firms. The variation in ownership structure enables us to employ a unique empirical approach that simultaneously examines three distinct groups of firms. The first group, which we denote "Wholly Owned," corresponds to privately held firms with few shareholders, often only one, that are intimately involved in the operations and management of the firm through positions on the board of directors, financing arrangements, and managerial positions. The second group, "Private Dispersed," consists of privately held firms with a dispersed shareholder base, often through employee ownership plans and extensive external financing arrangements. The third group, "Public," consists of publicly held firms.

In order to mitigate sample selection concerns associated with comparing public and private firms, we investigate two mutually exclusive samples: (1) a propensity score matched sample (Rosenbaum and Rubin 1983; Smith and Todd 2005); and (2) a sample of firms that undergo a transition from private to public status (or vice versa). While neither sample can be considered as randomly assigning firms to public and private status, both samples take significant and different strides toward that ideal. Thus, our conclusions are based primarily on results found in both samples.

Our first set of results illustrates that the propensity to smooth dividends (Lintner 1956) is closely linked to ownership structure. Specifically, we show that public firms are significantly more averse to omitting or cutting dividends than either wholly owned or private dispersed firms. In fact, for firms that transition from private to public (or vice versa) in our sample, the rate of dividend omission decreases by 56% and the rate of dividend cuts decreases

[1] Over 99% of firms in the United Kingdom are privately owned and are responsible for more than half of the U.K. gross domestic product (GDP). Similarly, the U.S. Small Business Administration reports that in 1998 businesses with fewer than 500 employees accounted for more than half of the U.S. GDP.

[2] Acharya, John, and Sundaram (2010) note that, other than the treatment of creditors and debtors in bankruptcy, the U.K. and U.S. financial systems are much alike. Allen, Carletti, and Marquez (forthcoming) also note that systems of corporate governance in the United States and United Kingdom are very similar.

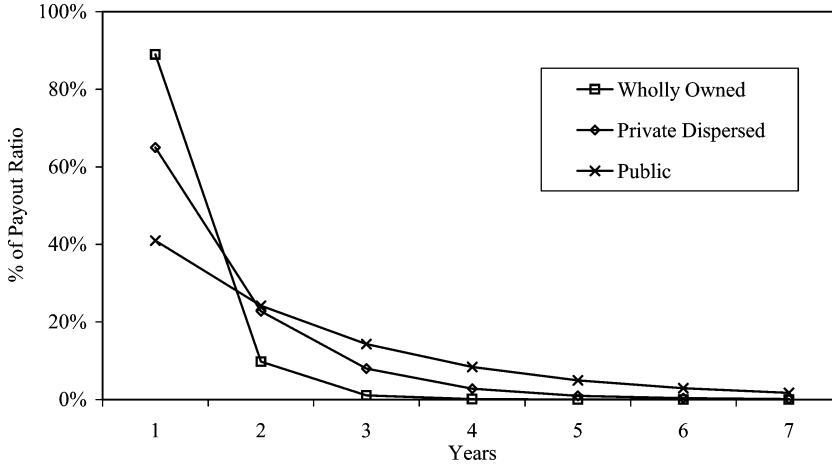

Figure 1
The Dynamic Response of Dividends to Earnings Shocks
The figure presents the estimated dividend impulse response functions corresponding to a one-unit (GBP) shock to earnings, as a fraction of firms' estimated target payout ratios. We present results for three matched samples of firms: Wholly Owned, Private Dispersed, and Public firms—each formally defined in the text. For example, a unit shock to earnings leads wholly owned firms to increase their dividends in the year of the shock by 92% relative to their target payout ratio. In the following year, dividends increase by 6% relative to their target payout ratio.

by 40% when firms are publicly held. Greater smoothing by public firms is also reflected in a lower tendency—approximately 38% lower—to initiate dividends as well.

We then show that the response of dividends to transitory earnings shocks varies significantly across the three groups of firms in a manner also consistent with the importance of public capital markets shaping dividend policy. Figure 1 shows the dynamic response of dividends, scaled by their estimated target payout ratio, to a temporary £1 earnings shock. Wholly owned firms immediately distribute over £0.20 of the £1 shock. Relative to their target payout ratio (i.e., dividends paid divided by earnings) of 0.23, this corresponds to an almost one-for-one increase in dividends associated with a transitory earnings shock, which has little effect on dividends three years after the shock. Private dispersed firms, in contrast, immediately distribute approximately 63% of the earnings shock (relative to their target payout ratio), which dissipates within four years. Finally, public firms immediately distribute only 41% of the earnings shock (relative to their target payout ratio), which now impacts dividend policy for over six years. Thus, private firms' dividend policies are significantly more sensitive to transitory earnings shocks, in contrast to public firms.

The classification of the sample into public firms, wholly owned firms, and private dispersed firms enables us to examine the role of incentive conflicts between active or controlling shareholders and minority shareholders. Wholly owned firms are tantamount to what Jensen and Meckling (1976) refer to as owner-manager firms in which there is little if any separation between ownership and control. As a consequence, frictions such as agency and

asymmetric information are of minimal concern. Private dispersed firms and public firms, in contrast, are subject to conflicts of interest and asymmetric information that may affect their dividend policy decisions. The significant role of agency conflicts on dividend-smoothing policy is also consistent with recent findings of Leary and Michaely (2011) on a sample of U.S. public firms.

We find that public firms distribute 27% of their profits in dividends; closely held firms (i.e., private dispersed firms) distribute only 18% of their profits in dividends. Wholly owned firms distribute only 13% of their profits as dividends. We also find that dividends from firms for which there are little or no information or incentive problems between managers and shareholders (wholly owned firms), are the most sensitive to investment needs. Thus, our results also highlight the potential role of inter-shareholder conflicts and asymmetric information in shaping corporate behavior, consistent with the theories of Jensen (1986), Miller and Rock (1985), and La Porta et al. (2000), among others.

Finally, we investigate the sensitivity of our findings to exogenous variation in the tax code induced by a modification to the U.K. tax code in 1997. Our findings are largely unaffected by this variation in taxes, suggesting that while taxes likely play a role in dividend policy, they are not responsible for the variation that we find here. Rather, our findings emphasize the importance of ownership structure and the attendant incentive conflicts and information environment engendered by that structure as being important for dividend policy.[3]

The remainder of the article is organized as follows. Sections 1 and 2 discuss the data and sample selection process. Section 3 examines Lintner's description of dividend smoothing as a function of ownership structure. Section 4 examines the level and sensitivity of dividends to theoretical determinants. Section 5 discusses our results in the context of the motivating theory. Section 6 concludes.

1. Data

1.1 Accounting data

The primary data source used in this study is the FAME database, provided by Bureau Van Dijk. FAME contains accounting statements (e.g., balance sheet, income statement, etc.) for all private and public companies in the United Kingdom, approximately 2.1 million in total. Our extract from this database encompasses a ten-year period covering 1993–2002, and our general sample frame definition follows that found in Brav (2009). We focus on private limited and public quoted firms.[4] We exclude assurance companies, guarantees, limited liability partnerships, public investment trusts, and "other" types. We do so to ensure that our sample contains only limited liability

[3] Our results are also consistent with a costly external finance story, in which the marginal value of internal funds is greater for private firms. Of course, such a story is ultimately predicated on an underlying information or agency problem, albeit one between insiders and outsiders as opposed to controlling and minority shareholders.

[4] Public quoted includes firms quoted on the London Stock Exchange, OFEX, and AIM.

companies to which the Companies Act applies. The Companies Act provides auditing and reporting requirements that we use below to select our sample.

While all companies are required to submit their financial statements, reporting requirements vary by firm size. In particular, under the 1981 Companies Act, "small" and "medium"-size firms are required only to file abridged statements. This leads to a large number of missing data values, especially for small firms that need to file only an abridged balance sheet and are not required to file a profit and loss statement. Additionally, financial statements are audited only if annual sales exceed £0.35 million before June 2000 and £1 million thereafter. Thus, to maximize the validity of our data and minimize missing values, we impose several additional criteria in drawing our sample.

First, we exclude firms that do not satisfy the auditing requirements. Second, we examine only consolidated financial statements to eliminate subsidiaries of larger holding companies, and minimizing the impact of inter-company dividends on our results. Third, we exclude all firms that underwent a leveraged buyout (LBO) because of their unique capital structure and governance mechanisms. Fourth, we exclude all small firms, as defined by Companies House, an executive agency of the U.K. Department of Trade and Industry. A firm is classified as small if two of three criteria are met: (1) annual sales less than £1.4 million; (2) book value of total assets less than £1.4 million; and (3) number of employees less than 50. These selection criteria help mitigate—but not eliminate—the potential for sample selection bias in our comparisons of private and public companies. By excluding small firms, we are also effectively eliminating those firms for which it is not possible to go public since these firms are unlikely to meet the listing requirement for the London Stock Exchange (LSE): £0.7 million in assets.

Finally, for consistency with previous studies and to avoid policies governed by regulation, we eliminate financial firms (U.S. Standard Industrial Classification [SIC] codes between 6000 and 6999), utilities (U.S. SIC codes between 4900 and 4939), agricultural firms (U.S. SIC codes less than 1000), and public sector firms (U.S. SIC codes greater than 8999). Combined, these screens reduce the number of firms from approximately 2.1 million to 8,751, corresponding to 69,651 firm-year observations that form our sample.[5]

Panel A of Table 1 presents summary statistics for our sample (all levels are inflation adjusted using the U.K. consumer price index [CPI]). Variations in the number of observations for each variable reflect missing data. The figures in brackets are medians. All variables in Table 1 and throughout the article are formally defined in Appendix A. We see that public firms are approximately

[5] While both private and public firms are subject to a baseline level of accuracy in their financial reporting (as set forth by Bureau Van Dijke [BVD]), it is possible that because of public scrutiny, the financial reports of public firms are less noisy; for example, because analysts follow and monitor public firms but not private firms. This is consistent with the notion that public firms are subject to more scrutiny than their private counterparts. However, the potentially greater noise in the financial reporting of private firms will reduce the power of the test we conduct, making it more difficult to find statistically reliable differences between public and private firms.

Table 1
Summary statistics

Panel A: Sample Frame

	Private			Public		
Variable	Obs	Mean	SD	Obs	Mean	SD
Size	60, 030	85.98	992.64	8,772	634.89	4, 642.35
		[10.00]			[48.33]	
Capital Investment	51, 273	0.18	0.68	7,634	0.37	1.35
		[0.02]			[0.06]	
Prof / Assets	57, 088	0.03	0.09	8,574	−0.02	0.22
		[0.03]			[0.04]	
Tangible Assets / Assets	58, 555	0.30	0.22	8,642	0.32	0.24
		[0.25]			[0.27]	
$I(DividendPayer)$	60, 834	0.41	0.49	8,817	0.71	0.45
		[0.00]			[1.00]	
Div / Prof	44, 673	0.25	0.47	6,110	0.47	0.52
		[0.00]			[0.38]	
Debt / Assets	39, 831	0.50	0.20	6,591	0.35	0.17
		[0.50]			[0.35]	
Sales Growth	47, 404	0.13	0.45	7,547	0.22	0.71
		[0.05]			[0.06]	
Profit Volatility	7, 528	0.06	0.05	1,189	0.13	0.15
		[0.04]			[0.07]	

(*continued*)

Table 1
Continued

Panel B: Transition Firms

	Private			Public		
Variable	Obs	Mean	SD	Obs	Mean	SD
Size	1, 155	204.76	1, 154.04	2, 764	248.25	1, 315.53
		[11.79]			[32.88]	
Capital Investment	859	0.49	1.51	2, 417	0.74	2.68
		[0.06]			[0.11]	
Prof / Assets	1, 074	−0.03	0.27	2, 707	−0.09	0.33
		[0.03]			[0.03]	
Tangible Assets / Assets	1, 099	0.31	0.25	2, 733	0.29	0.25
		[0.25]			[0.22]	
$I(Dividend\,Payer)$	1, 187	0.46	0.50	2, 775	0.57	0.50
		[0.00]			[1.00]	
Div / Prof	737	0.36	0.78	1, 636	0.41	0.48
		[0.16]			[0.33]	
Debt / Assets	771	0.42	0.21	1, 972	0.34	0.19
		[0.41]			[0.33]	
Sales Growth	759	0.73	3.60	2, 388	0.50	1.57
		[0.12]			[0.13]	
Profit Volatility	262	0.11	0.16	521	0.18	0.21
		[0.05]			[0.09]	

(*continued*)

Table 1
Continued

Panel C: Matched Samples

	Wholly Owned			Private Dispersed			Public		
Variable	Obs	Mean	SD	Obs	Mean	SD	Obs	Mean	SD
Size	3,824	715.75 [83.27]	2, 843.92	3,862	820.98 [81.70]	2, 861.61	3,862	847.54 [85.32]	3, 955.88
Capital Investment	3,632	0.09 [0.03]	0.25	3,670	0.12 [0.05]	0.32	3,670	0.18 [0.06]	0.44
Prof / Assets	3,629	0.03 [0.03]	0.05	3,683	0.03 [0.04]	0.05	3,669	0.03 [0.05]	0.09
Tangible Assets / Assets	3,626	0.34 [0.31]	0.20	3,657	0.39 [0.38]	0.22	3,669	0.32 [0.30]	0.20
$I(DividendPayer)$	3,824	0.46 [0.00]	0.50	3,862	0.82 [1.00]	0.38	3,862	0.83 [1.00]	0.38
Div / Prof	2,848	0.21 [0.00]	0.32	3,076	0.27 [0.20]	0.31	2,839	0.43 [0.40]	0.27
Debt / Assets	3,820	0.36 [0.33]	0.17	3,861	0.33 [0.30]	0.19	3,861	0.36 [0.35]	0.16
Sales Growth	3,635	0.08 [0.04]	0.23	3,672	0.07 [0.04]	0.20	3,670	0.09 [0.05]	0.24

The sample consists of all nonfinancial, nonagricultural, and nongovernment firms reporting consolidated financial statements in the FAME database during the period 1993–2002 that are subject to the Companies Act auditing requirement. Monetary units are in millions of British Pounds (GBP). The table presents summary statistics—mean, median (in brackets), and standard deviations (in parentheses)—for firm characteristics of public and private firms. All variables are defined in Appendix A. Panel A presents summary statistics for the entire sample frame. Panel B presents the results for the subsample of U.K. firms that undergo a transition from private to public. Panel C presents the results for the three matched samples—wholly owned, private dispersed, and public—that differ by their ownership structure.

eight times larger than private firms on average. Public firms also invest more, are more likely to pay a dividend, distribute a relatively larger fraction of profits through dividends, and experience greater sales growth. Though the median public firm is as profitable as the median private firm, private firms tend to be more highly leveraged. We also note that private firms have, on average, lower earnings volatility than public firms.

1.2 Ownership data

Ownership data are also collected from the FAME database. Ownership information includes data on the presence of a holding company (i.e., shareholder owning more than 50% in the company) and the number and identity of shareholders from three separate sources: Bureau Van Dijk, the annual return, and the registry, the last of which applies only to public quoted companies. The data also contain information on boards of directors. Although a rich source of information, these data have a number of limitations. First, the data are static and available only as of the last filing. Absent purchasing archived data—an expensive endeavor—there is no way to identify the evolution of the ownership structure but for significant changes. Specifically, we are able to identify transitions from private to public (e.g., initial public offering [IPO]) and public to private (e.g., LBO or managed buyout [MBO]) using additional data sources SDC Platinum from Thompson, Zephyr from Bureau Van Dijk, and Capital IQ.[6]

Second, the ownership data are incomplete and coarse. For firms with many shareholders, the data often indicate only that the number of shareholders are "too numerous to list" or that there is only a "bulk list of shareholders." Discussions with Bureau Van Dijk reveal that this data value is assigned to privately held firms with more than twenty shareholders. Our analysis of the data reveals that up to twenty-six shareholders are listed on the annual return for some privately held firms, suggesting that the twenty threshold is a lower bound to the number of shareholders implied by the data values "too numerous too list" or "bulk list of shareholders." Further, when specific shareholders are identified, there is little, if any, information regarding them. That is, it is not always obvious whether the shareholder is an individual or an institution, and whether or not there is an explicit relation to management (e.g., family member), though visual inspection is suggestive.

Nonetheless, the ownership data are rich enough to enable broad distinctions among firms beyond the distinction between publicly and privately held firms. One must recognize that the ownership structures of private firms exhibit far greater diversity than those of public firms. Some private firms exhibit little, if

[6] We thank Omer Brav for the use of his data from SDC and Zephyr that identify IPOs and buyouts during our sample horizon. We also thank Per Stromberg for the use of his data on buyouts (see Kaplan and Stromberg 2009). Additionally, we are able to identify a number of going-private transitions not captured by SDC or Zephyr by searching for the existence of a shareholder registry for each private firm, suggesting that the company was public as of the date of the registry.

any, separation between ownership and control because ownership is highly concentrated. For example, Zaira Caterers has only two shareholders: Mr. Hamid Ali, who owns ninety-nine ordinary £1 shares, and Mrs. Nazneed Ali, who owns one ordinary £1 share. Both Mr. and Mrs. Ali are also on the board of directors.

For such firms, shareholders internalize most, if not all, agency costs arising from adverse selection or moral hazard. In effect, these firms correspond closely to Jensen and Meckling's (1976) 100% owner-manager firms in which there is no expropriation of wealth from outside shareholders because there often are none. In the instances where outside shareholders do exist, visual inspection suggests that they are often immediate or close family members or informed and active monitors, such as financial intermediaries or corporations with close ties to the firm. Thus, the unique nature of this ownership structure works to better align incentives between controlling and minority shareholders, as in the case of Zaira Caterers. We refer to firms in which ownership is concentrated in the hands of less than twenty-six shareholders as "Wholly Owned" to denote their close integration of ownership and control.

While the number twenty-six is ad hoc, this value is less relevant for empirical purposes. The primary determinant of the wholly owned designation is that the shareholders are individually identified in FAME by either Bureau Van Dyjk or on the Annual Return, and are not "too numerous to list." Further, the distribution of the number of shareholders across firms is highly skewed with a long right tail, suggesting that for most wholly owned firms, ownership is concentrated among very few (median of four) shareholders.

There are also a number of privately held firms with a significant number of minority shareholders. For example, TI Automotive, a supplier of automotive parts, employs over 20,000 people in 130 facilities throughout 28 countries. Their current ownership structure is divided among management (25%), the Smiths Group technology company (19.9%), and a large number of "external shareholders" (50%). Similarly, Mott Macdonald is an employee-owned management, engineering, and development consultancy that employs over 9,000 people across the globe. These companies, and many more, stand in stark contrast to some common perceptions of private firms as small companies preparing to go public; however, they are also common in the United States.[7]

To ease our discussion, we refer to private firms for which there are too many shareholders to list on the annual return as "Private Dispersed" firms to highlight their private status but indicate their relatively diffuse ownership structure. Importantly, any error in our classification of private firms into either wholly owned or private dispersed groups will lead to an attenuation bias in our estimates because the firms will, in truth, not be any different along the

[7] According to Forbes, in 2004 there were over 300 privately held companies in the United States with revenues in excess of $1 billion. Examples of such companies include Cargill, Koch Industries, Mars, Bechtel, etc. In fact, on their website, Koch Industries—a family-run firm—notes that they "reward their people [spanned across sixty countries] like entrepreneurs, paying them a portion of the long-term value they create."

ownership dimension. The final group of firms is denoted "Public" and consists of all publicly held firms.

Because of their dispersed ownership, these last two groups of firms—namely, private dispersed firms and public firms—suffer from information and agency problems. In wholly owned firms, in contrast, there is no—or little—distinction between controlling and minority shareholders and, therefore, no information or incentive problems. Thus, these groups of firms form a spectrum of information asymmetry and agency problems—creating an interesting contrast that allows us to examine the role of agency costs and asymmetric information on dividend policy decisions.[8]

2. Sample Selection

An important consideration for our analysis is sample selection. As illustrated in Table 1, private and public firms differ across a number of dimensions that are correlated with firms' dividend policies. We take two approaches to address this concern, resulting in two mutually exclusive samples on which we focus our analysis.

2.1 The transition sample

The first approach involves looking at the sample firms that undergo a transition in ownership status from private to public or vice versa. Identifying what we will refer to as "Transition" firms directly addresses the sample selection issue by comparing the same firms as both a private and public entity. A limitation of this sample, however, is a lack of historical information on the ownership structure of these firms. This dearth of information complicates classifying these firms as private entities into the two private groups (wholly owned vs. private dispersed) discussed earlier. Additionally, the number of firms undergoing a transition is relatively small, thereby motivating our decisions to combine going-public and going-private transitions into one sample.[9]

Panel B of Table 1 presents summary statistics for the subsample of transition firms. As in Panel A, we see that, once public, transition firms invest more and have lower leverage. As public entities, these firms are also more likely to pay a dividend. Transition firms are, on average, also marginally smaller as private entities. In sum, most of the relations between public and private firms found in the full sample of firms hold for the subsample of transition firms, though the differences are far smaller in magnitude.

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[8] Differences in governance mechanism, institutional structure, and investors' composition may enable us to draw further distinctions between private dispersed firms and public firms with respect to the severity of agency and information issues. We discuss this possibility in a later section.

[9] In unreported analysis, we focus solely on firms transitioning from private to public and obtain results similar to those reported below.

2.2 The matched sample

While addressing one sample selection issue, the transition firms raise another. Specifically, the period surrounding the IPO (or MBO) is unique.[10] As such, these firms do not represent the more general population of public and private firms. Thus, we take an alternative approach to addressing the sample selection concern that enables us to comment on the differences in dividend policies between private and public firms more generally. This second approach is a propensity score matching algorithm developed by Rosenbaum and Rubin (1983, 1985) and extended by Heckman, Ichimura, and Todd (1997).

We prefer a matching technique instead of alternative approaches (multivariate regression) for several reasons. First, previous studies have confirmed that propensity score matching methods can allow for more accurate inferences in a treatment-control group setting such as ours (e.g., Conniffe, Gash, and O'Connell 2000). Second, the matching technique is less restrictive than regression-based approaches because we need not assume a linear association between firm characteristics and our measures of dividend policy (e.g., dividend/operating profit). Related, our inferences do rely on the extrapolation inherent in regression. Third, our data are particularly well suited to using a matching method (Heckman, Ichimura, and Todd 1997). The pool of controls, in this case private firms, is particularly large, which increases the likelihood of overlap in the support of firm characteristics across the two groups of firms. That is, it is more likely that we will find "close" matches for the public firms among the private firms. Additionally, both public and private firms operate in a similar environment: All firms are based in the United Kingdom and subject to the same reporting requirements for the data used in this study.

We discuss the intuition of the matching procedure here, relegating the details and results to Appendix B. The matching procedure finds for each public firm-year observation a corresponding private dispersed (or wholly owned) firm-year observation that is statistically indistinguishable along a number of dimensions. Of course, one would ideally match firms on as many dimensions as possible, but this number is tempered by statistical power considerations. Thus, we rely on previous empirical specifications, which suggest that firm size, profitability, leverage, investment opportunities (sales growth), and industry are important determinants of dividend policy (Allen and Michaely 2003 summarize these studies). The result of the matching procedure is three samples of firm-year observations, one sample corresponding to each of the three groups of firms (wholly owned, private dispersed, and public), which are statistically indistinguishable across a number of observable characteristics.

[10] Indeed, firms having undergone an LBO and thus owned and operated by private equity firms are, arguably, particularly special (e.g., Kaplan and Stromberg 2009). Consequently, we repeat all of our matched sample analysis after excluding firms for which we could identify private equity ownership (103 firms). These results are qualitatively similar to those reported below.

To illustrate the outcome of the matching process, consider Panel C of Table 1, which presents a comparison of firm characteristics across the three matched samples. Immediately, we note that the private firms, regardless of the ownership structure, are not small. The average book asset value of private firms is approximately £775 million, comparable, by construction, to that of public firms. This particular result reinforces the comment made earlier concerning preconceived notions of what constitutes a private firm. Our comparisons are made across firms of similar sizes, and these sizes are quite large. We also note that the other matching factors are economically similar and that the distribution across industries (not reported) is statistically indistinguishable across the three groups.

Before turning to our results, it is important to recognize the limitations of the matching procedure. The matching procedure can control only for selection on observables. Thus, unobservable differences among the groups can potentially compromise our identification strategy if those unobservable differences are also correlated with the observable characteristics. However, as the results in Table 2 and Appendix B illustrate, the matching procedure successfully homogenizes the groups along the dimensions mentioned above.

3. Dividend Smoothing

3.1 Motivation

In his seminal paper, Lintner (1956) questions managers on their attitudes toward dividend policy and concludes that managers target a long-term payout ratio. He also finds that dividends are sticky, tied to long-term sustainable earnings, paid by mature companies, and smoothed from year to year. These findings have since been confirmed with more recent empirical and survey evidence (Fama and Babiak 1968; Brav et al. 2005).

Despite the robustness of these findings, neither Lintner (1956) nor the literature that followed has been able to offer an explanation as to *why* firms are so reluctant to cut dividends or why they appear to smooth dividends. However, there are several reasons to suspect that this behavior is linked directly to whether or not a firm is publicly traded. First, empirical evidence suggests that management's reluctance to cut dividends is partly driven by investors' reactions to such announcements. For example, Michaely, Thaler, and Womack (1995) find that the consequences for dividend omissions are severe: Equity prices fall, on average, by 6.1%. Further, the reaction to increases and decreases is asymmetric: The average abnormal returns associated with dividend increases and decreases are 1.34% and –3.71%, respectively (Grullon, Michaely, and Swaminathan 2002). For private firms, the immediate change in value is less visible and, therefore, potentially less important for the decision-making process.

Second, Brav et al. (2005) report survey evidence consistent with the notion that managers of private firms view the consequences of dividend cuts

Table 2
Dividend changes for private and public firms

Panel A: Matched Sample

		Sample				
		Wholly	Private	Public	*t*-Statistics	
Variable	Statistic	Owned (a)	Dispersed (b)	(c)	(a)-(c)	(b)-(c)
Pr(Omit)	Mean	0.079	0.028	0.037		
	SE	0.007	0.006	0.003	5.596	−1.356
	Median	0.000	0.000	0.000		
	Obs	3,824	3,862	3,862		
Pr(Cuts)	Mean	0.208	0.221	0.165		
	SE	0.010	0.029	0.007	3.383	1.922
	Median	0.000	0.000	0.000		
	Obs	3,824	3,862	3,862		
Decrease / Dividends	Mean	−0.628	−0.447	−0.512		
	SE	0.023	0.060	0.016	−4.200	1.055
	Median	−0.707	−0.365	−0.500		
	Obs	794	855	637		
Pr(Initiation)	Mean	0.066	0.050	0.030		
	SE	0.005	0.012	0.003	6.009	1.621
	Median	0.000	0.000	0.000		
	Obs	3,824	3,862	3,862		
Pr(Increase)	Mean	0.264	0.524	0.640		
	SE	0.013	0.034	0.013	−20.891	−3.165
	Median	0.000	1.000	1.000		
	Obs	3,824	3,862	3,862		
Increase / Dividends	Mean	2.382	0.774	0.248		
	SE	0.582	0.254	0.010	3.668	2.073
	Median	0.378	0.142	0.127		
	Obs	740	1,796	2,310		

(*continued*)

Table 2
Continued

Panel B: Transition Firms

Variable	Statistic	Sample		*t*-statistic
		Private (a)	Public (b)	(a)-(b)
Pr(Omit)	Mean	0.070	0.046	
	SE	0.007	0.004	2.937
	Median	0.000	0.000	
	Obs	1,103	2,699	
Pr(Cuts)	Mean	0.351	0.226	
	SE	0.014	0.009	7.599
	Median	0.000	0.000	
	Obs	1,103	2,699	
Decrease / Dividends	Mean	−0.669	−0.598	
	SE	0.027	0.022	−2.041
	Median	−0.749	−0.634	
	Obs	180	406	
Pr(Initiation)	Mean	0.080	0.042	
	SE	0.007	0.004	4.661
	Median	0.000	0.000	
	Obs	1,103	2,699	
Pr(Increase)	Mean	0.275	0.403	
	SE	0.017	0.017	−5.310
	Median	0.000	0.000	
	Obs	1,103	2,699	
Increase / Dividends	Mean	1.518	0.573	
	SE	0.205	0.043	4.508
	Median	0.500	0.174	
	Obs	213	966	

Panel A presents summary statistics for three matched samples of firms: Wholly Owned, Private Dispersed, and Public firms—each formally defined in the text. Panel B presents summary statistics and hypothesis test results for the sample of firms that underwent a transition from Public to Private (or vice versa) status. The *t*-statistics test pairwise differences in means using standard errors that are corrected for within-firm correlation and heteroscedasticity. *Pr(Omit) (Pr(Initiation))* is the fraction of firm-year observations that follow a non-zero (zero) dividend payment in year $t-1$ with a zero (non-zero) dividend payment in year t. *Pr(Cut) (Pr(Increase))* is the fraction of firm-year observations that experience a decrease (increase) in the level of dividends from year $t-1$ to year t. *Decrease (Increase) / Dividends* is the change in dividends from year $t-1$ to year t divided by year-end dividends in year $t-1$ for firm-year observations that experience a decrease (increase) in dividends over the year.

and omissions as less severe than their public counterparts, primarily because of differences in information content. They also report that private firms are more likely to pay dividends in response to temporary changes in earnings, suggesting that private firms' dividend policies are more erratic. Overall, while there is suggestive evidence on the importance of public capital markets in shaping dividend policy, there is no direct evidence on its relevance. Comparing dividend policies of public and private firms, as we do here, provides such direct evidence on this potentially important link.

In the context of our three groups of firms, this discussion suggests that public firms will tend to "smooth" their dividend streams relative to both groups of private firms: private dispersed and wholly owned (Gutman et al. 2010). Specifically, public firms should be less likely to alter their dividend payments via increases, decreases, omissions, or initiations than private firms. Similarly, public firms' dividend policies should be less sensitive to transitory earnings shocks relative to private firms.

While these conjectures are motivated by the presence or absence of public capital markets, it is also likely that smoothing is related to agency issues or asymmetric information—a key distinction between these groups. If so, then we may be able to distinguish between the temporal behaviors of the two groups of private firms as follows. Wholly owned firms' dividend policies should correspond most closely to those predicted by Miller and Modigliani's (1961) irrelevance proposition because these firms are subject to the least severe information and agency problems. That is, dividends for wholly owned firms should behave approximately like the residual decision, made after investment and financing decisions. This suggests that wholly owned firms are more likely to alter their dividend stream and less likely to smooth dividends than private dispersed firms.

3.2 Results

Table 2 provides a detailed analysis of public and private firms' policies toward changing dividends. The estimates presented are unconditional in the sense that they do not depend on whether or not a firm paid a dividend in the previous period. In unreported analysis, we examine estimates conditional on the firm paying a strictly positive dividend at time $t-1$ (with the exception of initiations) and find qualitatively similar results.[11]

Focusing first on the matched sample of firms in Panel A, the first row presents estimates of the propensity to omit a dividend, where a dividend omission is defined as a firm-year observation in which the firm pays a positive dividend in the preceding year but no dividend in the current year. The results show that wholly owned firms omit a dividend 8.0% of the time, private dispersed firms 2.8% of the time, and public firms 3.7% of the time.

[11] For the matched samples, 46% of wholly owned, 79% of private dispersed, and 83% of public firms pay dividends in any given year.

The last two columns present *t*-statistics for pairwise comparisons of the difference in mean values for the private dispersed (wholly owned) and public firms. Here, as in all statistical analysis, test statistics are computed using standard errors that are robust to within-firm correlation and heteroscedasticity (Petersen 2009). Consistent with the discussion above, these tests show that wholly owned firms are more than twice as likely to omit a dividend relative to public firms. This result also suggests that dividends are not simply a wage channel for manager-owners.

The next row examines the propensity to cut dividends, defined as a firm-year observation in which the change in dividend is negative. We find a sharper pattern for dividend cuts: Both groups of private firms are significantly more likely to cut their dividends than public firms. Both pairwise differences are statistically significant at the 1% and 10% levels. Finally, conditional on cutting dividends, wholly owned firms decrease their dividends by significantly more than public firms, though we find no difference in the average relative magnitude of dividend cuts between private dispersed and public firms. Private firms are not only more likely to cut and omit dividends, they are also more likely to initiate dividends. In a given year, 6.6% of wholly owned firms initiate dividends, compared with 5.0% of private dispersed firms and only 3.0% of public firms.

Perhaps the most striking result, however, pertains to dividend increases. Public firms increase their dividends 64% of the time, relative to 52% for private dispersed and only 26% for wholly owned. In light of the above conjectures, this result might seem surprising. However, the relative magnitudes of dividend increases exhibit precisely the opposite pattern, consistent with Lintner's observations. Specifically, the magnitude of public firms' dividend increases are approximately one-quarter the size of private dispersed firms and one-tenth the size of wholly owned firms. (An inspection of medians reveals a similar ranking.) Unreported analysis also reveals that the frequency of large changes in dividends also increases as one progresses from public to private dispersed to wholly owned. The likelihood of increasing one's dividend by at least 50% is 13%, 19%, and 33%, respectively, with all pairwise differences being statistically significant. Thus, while public firms increase dividends more frequently than private firms, they do so in much smaller amounts.

Panel B presents results for our transition sample and illustrates a close correspondence with those found in the matched sample. The results illustrate that when private, firms are significantly more likely to omit, decrease, and initiate a dividend than when they are public. However, as public entities, firms are more likely to increase their dividend, although these increases are significantly smaller than increases as private entities. Thus, the results of Table 2 suggest that public firms are averse to omitting, cutting, and initiating dividends relative to otherwise similar private firms—differences that appear more pronounced relative to wholly owned firms than private dispersed firms.

Another aspect of dividend smoothing is the response of firms' dividend policies to transitory earnings shocks. Table 2, in fact, already presents indirect evidence of differential responses to earnings shocks. Public firms appear to follow a unique strategy of relatively numerous but small increases in their dividends coupled with a strong aversion to any negative or large changes. However, Table 3 presents direct evidence on this hypothesis by estimating a partial adjustment model of dividends similar to that initially inspired by Lintner (1956) and subsequently used by Fama and Babiak (1968) and Brav et al. (2005).

This formulation for firm i in period t is

$$\Delta Dividend_{it} = \alpha_i + \lambda_i(\beta_i Profit_{it} - Dividends_{it-1}) + \varepsilon_{it}, \qquad (1)$$

where $\Delta Dividend_{it}$ is the change in dividend for firm i from period $t-1$ to t, $Profit_{it}$ is operating profit (loss), and ε_{it} is a random error term.[12] Intuitively, Lintner's model implies that firms have a target payout ratio, β_i, measured as a fraction of their profits. Any difference between last period's dividends and the target level is reduced by a fraction λ_i each period. This parameter corresponds to the response of firms' dividend policies to transitory earnings shocks and is sometimes referred to as the speed of adjustment. Large values for λ suggest an erratic dividend policy characterized by large changes driven by transitory shocks. Conversely, small values for λ suggest a smooth, persistent dividend policy characterized by insensitivity to transitory earnings shocks and a desire to smooth such shocks over time.

We estimate the model in Equation (1) separately for each firm and then present the distribution of resulting parameter estimates.[13] This approach has been used in previous studies, such as Brav et al. (2005). Because time series observations are at a premium for this analysis, we utilize the entire time series for each firm in the matched sample, conditional on nonmissing data for at least eight observations. Finally, to mitigate heteroscedasticity and confounding scale effects, we run weighted regressions using the inverse of total assets as the weight.[14]

Table 3 presents the estimation results. We see a monotonic and significant decline in the average λ when moving from wholly owned firms (0.83) to private dispersed firms (0.63) to public firms (0.41). (Medians show a similar relation.) These estimates imply that wholly owned firms' dividend policies exhibit the highest sensitivity to transitory earnings shocks, followed by private

[12] Unreported results using net profits lead to similar findings.

[13] Estimating this model poses several econometric challenges (Arellano and Bond 1991; Blundell and Bond 1998). However, because of data limitations, particularly a short time series of observations, more advanced econometric procedures do not produce reliable results, as suggested by model diagnostics, and lead to economically unrealistic parameter estimates. Thus, we follow previous studies examining this issue in order to ease comparisons.

[14] Regression results using variables normalized by the total assets as of the start of the period are virtually identical to those presented.

Table 3
Lintner model of dividends

Parameter	Firms	Mean	SE(Mean)	Min	25%	Median	75%	Max
				Wholly Owned Firms				
α	830	0.88	0.27	−2.36	−0.00	0.03	0.29	25.47
λ (Speed of Adjustment)	803	0.83	0.01	−0.04	0.54	0.88	1.14	1.72
β (Target Payout Ratio)	805	0.23	0.02	−0.58	0.00	0.09	0.37	1.75
				Private Dispersed Firms				
α	201	0.07	0.02	−0.53	0.00	0.02	0.09	1.56
λ (Speed of Adjustment)	196	0.63	0.03	−0.20	0.20	0.65	1.00	1.49
β (Target Payout Ratio)	196	0.15	0.03	−0.26	0.01	0.08	0.24	1.14
				Public Firms				
α	451	2.64	0.96	−1.66	0.03	0.18	1.12	84.06
λ (Speed of Adjustment)	449	0.41	0.02	−0.26	0.11	0.33	0.67	1.40
β (Target Payout Ratio)	449	0.21	0.07	−0.94	0.01	0.14	0.36	2.67

The estimation sample consists of all firm-year observations for firms in each of the three matched samples—Wholly Owned, Private Dispersed, and Public firms—each formally defined in the text. The table presents summary statistics for the distribution of parameter estimates from Lintner's (1956) model of dividends. Specifically, we model dividends as

$$\Delta Dividend_{it} = \alpha_i + \lambda_i(\beta_i Profit_{it} - Dividend_{it-1}) + \varepsilon_{it},$$

where β represents the target payout ratio measured as a fraction of profits, and λ represents the speed of adjustment or the fraction of the gap between last period's dividend and this period's target that is closed by this period's dividend. We estimate the model for each company, which produces a cross-section of parameter estimates. The model is estimated separately on each firm in each of the three matched samples by weighted least squares, where the inverse of the total assets is the weight. We require each firm to have at least eight observations for the regression. The table presents summary statistics for the distribution of parameter estimates, which have been trimmed at the upper and lower 2.5 percentiles. All variables are defined in Appendix A.

dispersed firms, and finally public firms, whose dividend policies are relatively insensitive to such shocks.

These results are illustrated in Figure 1, which presents the estimated impulse response function, scaled by the estimated long-run (i.e., target) payout ratio, for each set of firms. For example, consider wholly owned firms with an average estimated long-run payout ratio (i.e., dividends paid divided by earnings) of 23%. Immediately after a £1 shock to profits, wholly owned firms distribute approximately £0.20 of the additional earnings to shareholders through an increase in dividends. Relative to the target payout ratio, this corresponds to an 88% distribution, which is the estimated λ. This implies that dividends change almost one-for-one, relative to the long-run payout ratio, at the time of the earnings shock. In the following year, dividends increase by only 6% relative to their average level and less than a percent thereafter.

Private dispersed firms distribute only £0.095 of the £1 earnings shock in the initial period. However, relative to their target payout ratio, 15%, this distribution corresponds to an immediate increase in dividends of approximately 63% in response to the shock. After only four years, the effect of the earnings shock is effectively gone. Finally, public firms distribute £0.086 of the £1 earnings shock in the initial period. Relative to their target payout ratio, 21%, this distribution corresponds to an immediate increase in dividends of only 41% in response to the shock. In the subsequent years, we see that the effect of the shock is still felt in dividends, having been smoothed over the next six to seven years.

These results are consistent with the notion that public firms follow more conservative dividend policies than private firms. Figure 2 illustrates these features by presenting dividend paths for three firms from our sample. One firm from each of the three groups—wholly owned, private dispersed, and public firms—is represented in the figure. The values in the figure correspond to the percentage change in dividends relative to the first year's dividends. For example, for wholly owned firms, dividends in 1993, 1994, and 1995 are 67, 146, and 200 million pounds, respectively. The percentage changes relative to the dividends in 1993 are 0% (=(67–67)/67), 118% (=(146–67)/67), and 199% (=(200–67)/67). As evident from the time-series volatility, the year-to-year changes in dividends for public firms are less volatile than those for private dispersed firms. And, both public and private dispersed firms' dividends exhibit relatively less volatility than wholly owned firms.

These findings are also consistent with the evidence in Table 2, where we found a relatively strong aversion to negative dividend changes and a propensity for frequent, but small, dividend increases among public firms. This behavior implies a relatively nonvolatile dividend path for public firms, which we are able to confirm and quantify with the analysis in Tables 2 and 3, and Figure 1. We also note that these findings are not an artifact of higher earnings volatility for private firms. In unreported results, we find that the ratio of profits to assets actually exhibits *greater* within-firm variation for public firms when

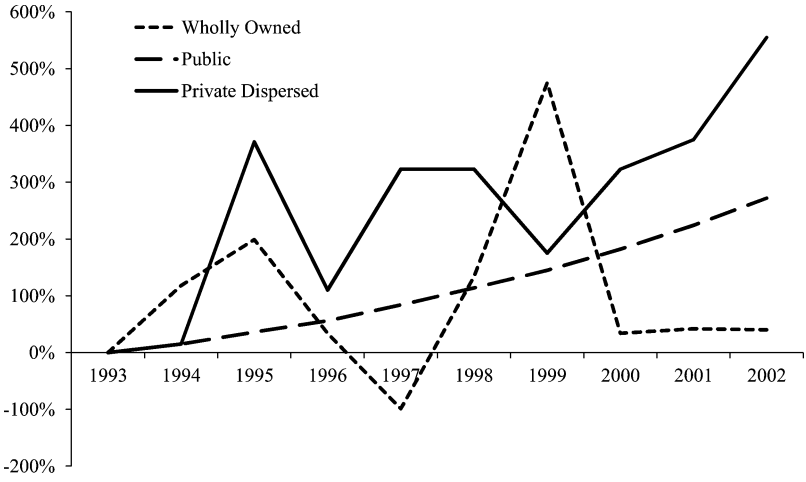

Figure 2
Sample dividend paths
The figure presents dividend paths for three firms from our sample. One firm from each of the three groups—Wholly Owned, Private Dispersed, and Public firms—is represented in the figure. The values in the figure correspond to the percentage change in dividends relative to the first year's dividends. For example, for wholly owned firms, dividends in 1993, 1994, and 1995 are 67, 146, and 200 million pounds, respectively. The percentage changes relative to the dividends in 1993 are 0% (=(67-67)/67), 118% (=(146-67)/67), and 199% (=(200-67)/67).

compared with both sets of private firms, consistent with the summary statistics presented in the last row of Table 1.

These findings shed new light on Lintner's (1956) description of firms' dividend policies. First, Lintner's finding of dividend smoothing appears related to market frictions, such as agency conflicts and information asymmetry. In wholly owned firms, where such frictions are minimal, there is little, if any, smoothing of dividends, and the adjustment is almost immediate. However, in private dispersed and public firms, where such frictions are present, there is relatively more significant dividend-smoothing behavior.

Second, the scrutiny of public capital markets also seems to play a significant role in the decision to smooth dividends—above and beyond what is implied by variation in agency costs and information asymmetry. Public firms smooth their dividends the most, followed by private dispersed firms, and then wholly owned firms. Thus, information and agency explanations may be responsible for only a part of the motivation behind dividend smoothing. The remainder appears to come from the scrutiny of the public capital markets.

To gain further insight and ensure the robustness of our inferences, we take a nonparametric approach to the smoothing issue by examining the differential response of dividends to negative and positive earnings shocks. We define the shocks as the residuals from firm-by-firm regressions of earnings on a constant and a time trend. Residuals falling in the lower (upper) third of the distribution are classified as negative (positive) earnings shocks. The results are presented in Table 4. Consistent with previous findings, wholly owned

Table 4
Dividend responses to negative and positive earnings shocks

Panel A: Matched Sample

	Sample			*t*-Statistics		
Variable	Wholly Owned (a)	Private Dispersed (b)	Public (c)	(a)-(b)	(a)-(c)	(b)-(c)
Negative Earnings Shock	0.02	−0.06	0.05	1.27	−0.44	−4.64
Positive Earnings Shock	0.42	0.34	0.17	0.76	2.64	4.41

Panel B: Transition Firms

Variable	Private	Public	*t*-Statistic
Negative Earnings Shock	−0.16	−0.00	−2.00
Positive Earnings Shock	0.27	0.22	0.54

The table shows the dividend response, measured by the growth in dividends, to negative and positive earnings shocks. Earnings shocks are measured by the residual from a firm-specific regression of earnings on a constant and a time trend. The shocks are ranked into three groups, and negative (positive) earnings shocks are those shocks falling in the lowest (highest) group. Panel A presents summary statistics and hypothesis test results for the three matched samples of firms—Wholly Owned, Private Dispersed, and Public firms—each formally defined in the text. Panel B presents the results for the sample of firms that underwent a transition from public to private (or vice versa) status.

and private dispersed firms' dividends tend to be more sensitive to earnings changes, whether positive or negative, relative to public firms. For example, wholly owned firms increase dividends by 42% and public firms increase by 17%. This finding also holds across matched and transition samples. Among transition firms, as private entities dividends decrease by 16% in response to a negative earnings shock, in contrast to the 0% change as public entities.

4. Dividend Policy Characteristics of Public and Private Firms

In this section, we investigate whether the level of dividends and the relation between dividends and theoretical determinants vary across the ownership strata. Focusing first on the level of dividends, Table 5 presents summary statistics for two different measures of dividend distributions: the ratio of dividends to operating profits and the ratio of dividends to total assets. The former measure has a more natural economic interpretation of a payout ratio, whereas the latter is simply an alternative normalization. Panel A of Table 5 reports the results. Public firms distribute 27% of their operating profits in dividends (and 2% dividends-to-assets ratio), and private dispersed firms distribute 17.8% of operating profits (0.9% of assets). Wholly owned firms pay the lowest relative dividend: 13.4% of operating profits and 0.7% of assets.

Panel B of Table 5 performs a similar comparison for the transition sample, finding that firms pay relatively higher dividends, on average, when they are public than when they are private. Relative to operating profits (assets), transition firms as public entities distribute 19.2% (1.1%), compared with only 12.1% (0.7%) as private entities. However, a potential concern with this comparison is that, unlike the matched sample, the public and private comparison made here is not between homogeneous observations. Namely, as firms transition from public to private (or vice versa), other characteristics possibly related to dividend policy may also change. Therefore, in unreported results, we estimate a firm-fixed effect regression containing the controls that we use in the matching procedure (i.e., size, profitability, leverage, sales growth, and industry) to better isolate the marginal effect of being public on dividends. Consistent with the results in Panel B, we find that public firms pay out a significantly higher share of profits in the form of dividends, though the magnitude of the difference is slightly smaller than that found in Panel B.

Turning to the relation between dividends and theoretical determinants, we follow La Porta et al. (2000) by regressing dividend ratios on sales growth, which corresponds to their, and our, empirical proxy for investment opportunities. Specifically, we regress dividends normalized by operating profits in year t on sales growth in year $t + 1$ and control for size, leverage, profitability, and industry and year indicator variables. We use a forward-looking proxy for investment opportunities for several reasons. First, lagged values of sales growth are more reflective of past profitability than future

Table 5
Dividend levels for private and public firms

Panel A: Matched Sample

		Sample			*t*-Statistics		
Variable	Statistic	Wholly Owned (a)	Private Dispersed (b)	Public (c)	(a)-(b)	(a)-(c)	(b)-(c)
Dividends / Operating Profit	Mean	0.134	0.178	0.273			
	SE	0.008	0.021	0.006	−1.918	−14.098	−4.285
	Median	0.000	0.107	0.260			
	Obs	2,078	2,249	2,177			
Dividends / Assets	Mean	0.007	0.009	0.020			
	SE	0.000	0.001	0.001	−1.599	−16.701	−10.573
	Median	0.000	0.006	0.019			
	Obs	2,635	2,641	2,689			

Panel B: Transition Firms

		Sample		t-statistic
Variable	Statistic	Private (a)	Public (b)	(a)-(b)
Dividends / Operating Profit	Mean	0.121	0.192	
	SE	0.008	0.006	−7.193
	Median	0.068	0.200	
	Obs	683	1,513	
Dividends / Assets	Mean	0.007	0.011	
	SE	0.001	0.001	−4.811
	Median	0.000	0.003	
	Obs	1,039	2,488	

Panel A presents summary statistics and hypothesis test results for the three matched samples of firms—Wholly Owned, Private Dispersed, and Public firms—each formally defined in the text. Panel B presents summary statistics and hypothesis test results for the sample of that underwent a transition from public to private (or vice versa) status. All standard errors are robust to heteroscedasticity and within-firm correlation.

investment opportunities. Second, insofar as firms have unbiased one-year projections of product demand, our proxy seems reasonable. Finally, this measure is similar to that used in La Porta et al. (2000) and, therefore, enables a close comparison with their results.

The results are presented in Table 6. We begin in Panel A, which presents ordinary least squares (OLS) estimates for the three groups of firms from the matched sample. Again, we present results examining the ratio of dividends to operating profits and the ratio of dividends to assets to ensure the robustness of our findings. Focusing attention on the former ratio, we note that the estimated coefficient on sales growth is largest—in magnitude—for the wholly owned firms (–0.122 with a *t*-statistic of –2.0), followed by public firms (–0.073 with a *t*-statistic of –3.4), and finally private dispersed firms (–0.070 with a *t*-statistic of –0.37), which show no statistically significant association between the level of dividends and investment opportunities. We find similar, though statistically weaker, results for the ratio of dividends to total assets, though the relation among private dispersed firms is positive. These findings suggest that wholly owned firms' dividends are more sensitive to investment needs than those of either public firms or private dispersed firms.

Panel B reports findings for the transition firms that suggest the exact opposite. In particular, firms as public entities exhibit a more significant negative association than they do as privately held companies. The reconciliation of these findings is not obvious. However, we conjecture that this difference may be due to the unique period surrounding the IPO.

To summarize, in the base case, when there are no agency and information problems (the wholly owned sample), dividends are highly sensitive to changes in investments: Dividends decrease when cash is needed and vice versa, though, this finding is unique to the nontransitioning firms. Further, dividend levels are relatively low among wholly owned firms.

5. Discussion

Our findings thus far are broadly consistent with information and incentive problems playing a role in shaping dividend policy. However, they do not exclude alternative explanations. Additionally, they do little to help us understand the distinction between private firms with dispersed ownership and public firms. To these ends, we examine the sensitivity of our results to alternative explanations in this section. We are cautious to note that the tests and discussion of this section do not rule out alternative theories playing a role in dividend policy in general. Rather, we attempt to assess only the extent to which our particular findings may be interpreted in another light.

5.1 Reconciling the results with theory

5.1.1 Signaling. Signaling is a frequently cited motivation for dividend policy. However, we note that the implications of the signaling models are unclear

Table 6
Dividend-level regressions

Panel A: Matched Sample

	Dividends / Operating Profit			Dividends / Assets		
Parameter	Wholly Owned	Private Dispersed	Public	Wholly Owned	Private Dispersed	Public
Intercept	−0.094	0.068	0.037	−0.010	−0.008	−0.005
	(−0.791)	(0.194)	(0.852)	(−1.512)	(−0.385)	(−1.846)
Sales Growth(t+1)	−0.122	−0.070	−0.073	−0.006	0.008	−0.002
	(−2.032)	(−0.365)	(−3.421)	(−1.768)	(0.441)	(−1.775)
Size	0.032	0.013	0.027	0.002	0.001	0.002
	(4.377)	(0.578)	(10.075)	(4.436)	(0.477)	(9.498)
Debt / Assets	−0.221	−0.131	−0.175	−0.010	−0.000	−0.014
	(−3.527)	(−0.915)	(−4.551)	(−2.513)	(−0.066)	(−5.633)
Oper Prof / Assets	0.279	0.015	−0.054	0.085	0.070	0.098
	(1.119)	(0.020)	(−0.711)	(7.025)	(3.415)	(20.075)
Obs	2,110	2,229	2,304	2,548	2,532	2,660

(*continued*)

Table 6
Continued

Panel B: Transition Firms

	Dividends / Operating Profit		Dividends / Assets	
Parameter	Private	Public	Private	Public
Intercept	−0.014	−0.114	−0.010	−0.010
	(−0.202)	(−2.816)	(−2.004)	(−2.544)
Sales Growth(t+1)	0.033	−0.029	0.001	−0.001
	(1.069)	(−2.217)	(0.678)	(−1.175)
Size	0.010	0.031	0.002	0.002
	(1.502)	(8.985)	(3.375)	(6.317)
Debt / Assets	−0.025	−0.093	−0.001	0.001
	(−0.724)	(−3.021)	(−0.180)	(0.216)
Oper Prof / Assets	0.298	0.197	0.010	0.028
	(2.689)	(4.313)	(2.158)	(9.843)
Obs	348	929	450	1,293

The table presents estimates from a regression of dividends in year *t*, normalized by year-end operating profits in *t*, on several variables. Panel A presents the results from estimating the regression on each of the three matched samples of firms—Wholly Owned, Private Dispersed, and Public firms—each formally defined in the text. Panel B presents the results from estimating three regressions on the subsample of firms that underwent a transition from public to private (or vice versa) status. Variable definitions are provided in Appendix A. Also included in the regressions but not presented are year indicator variables. Standard errors are robust to both heteroscedasticity and within-firm correlation.

in our setting. In the standard signaling models, firms manage their dividend policy (both level and smoothing) because they care about market prices (e.g., Miller and Rock 1985). Private firms have no publicly traded securities and therefore less concern over the current valuation of their securities. The greater dividend smoothing found among public firms relative to wholly owned firms appears consistent with a signaling explanation. However, the signaling implication is less clear when comparing public and private dispersed firms.[15]

5.1.2 Taxes. While taxes may be an important factor in determining dividend policy in general, they are unlikely to affect the difference in dividend policy between public and private firms. All U.K. firms, both public and private, are subject to the same tax environment and dividend imputation schemes (see Ball and Shivakumar 2005; Bell and Jenkinson 2002). Nonetheless, taxes may play a role in shaping dividend policy via differences in the ownership structure discussed above. For example, it is possible that the marginal (and average) investors of private and public firms are subject to different taxes. Thus, in spite of a homogeneous tax environment, variation in the marginal investor across these groups of firms can produce variation in the value of dividends to the investors in these groups of firms.

As in most studies, testing the effect of taxes is complicated by the inability to observe the relevant tax rate of the marginal investor. We explicitly examine the sensitivity of our results to an exogenous change in the tax regime. In 1997, the incoming Labour government radically reformed the taxation of dividend income in the United Kingdom by withdrawing the ability of tax-exempt investors (e.g., pension funds) to reclaim dividend tax credits. This change led to a 20% reduction in the value of their dividend income. As pension funds own almost a quarter of the outstanding publicly traded equity in the United Kingdom (Bell and Jenkinson 2002), this act represents a significant shift in the after-tax value of dividends to a significant investor in the public equity markets. We use this policy shift, as Bell and Jenkinson (2002) do in the context of their ex-dividend day study, to examine the sensitivity of our results to tax considerations.

Because the results based on before- and after-1997 subsamples are qualitatively and quantitatively similar to those presented above, we limit ourselves to a discussion of the most salient findings. For example, we find that the average ratios of dividends to assets in the pre-1997 era for wholly owned, private dispersed, and public firms are 0.01, 0.012, and 0.022, respectively. In the post-1997 era, the average ratios are 0.007, 0.009, and 0.020, respectively. Additionally, the pairwise differences between public firms and the two private firm groups are statistically significant in both eras. We also find identical patterns in the propensity to omit, cut, initiate, and increase dividends across

[15] We thank a referee for this insight.

the three groups of firms in both the pre- and post-1997 period. Thus, even after a change in the effective tax rate on dividends for a particularly significant clientele, our results show no significant response to this change.

Perhaps another potential channel for taxes to influence dividend policy differentially across public and private firms is through differences in owners' abilities to substitute between dividends and wages as a means for compensation. An owner of a wholly owned firm may find it advantageous to be paid in the form of dividends relative to wages, which are taxed at a higher rate than ordinary income. Assuming the tax authority (Inland Revenue) would allow such a policy (which is unlikely), its most obvious implication is that wholly owned firms should pay higher dividends than either private dispersed firms or public firms. As the results in Table 5 suggest, this is clearly not the case. Moreover, if this type of tax savings is the primary motive behind private firms' dividend policies and any differences in the dividend policies of private and public firms, then it is unclear why only 42% of the wholly owned firms in our sample pay dividends compared with 81% of public firms that pay dividends. Thus, substitution between dividends and wages does not appear to be a first-order activity for most private firms.

Again, the evidence in this section does *not* imply that taxes are irrelevant for dividend policy. It simply suggests that most of our results are unlikely to be explained solely by tax considerations.

5.1.3 Costly external finance. Information and agency problems between current shareholders and new investors can create a wedge between the cost of internal and external finance. Specifically, external finance is more costly, the more severe these frictions. Because market prices of public firms are readily available, potential new buyers of shares of public firms have an important piece of information that private firms cannot provide. This wedge implies that public firms have greater (or less costly) access to external capital than their private firm counterparts. As such, private firms may be less willing to distribute cash, which represents a relatively low marginal cost source of funds.

While these frictions are still based on information and agency problems, it is important to note that thus far we concentrated on how these frictions affect the interaction of majority and minority shareholders; that is, between two groups of shareholders inside the firm. The information and agency problem behind costly external financing is based on the potential interaction between current shareholders and potential investors. An immediate implication of this perspective is that private firms should pay lower dividends than public firms because of the difference in the external cost of capital. Additionally, dividends of private firms may be more sensitive to earnings. Both of these implications are borne by the data (Tables 5 and 3, respectively). The third implication, that the dividends of private firms, whether wholly owned or dispersed, are

more sensitive to investment opportunities, is only partially supported by the data. Wholly owned firms' sensitivity is indeed higher but not that of private dispersed (Table 6).

Ultimately, several of our findings are consistent with a costly external financing story. We view this fact as complementary to intra-shareholder conflict interpretation. Both explanations are based on information and agency problems and highlight that these basic frictions can impact dividend policy through multiple channels.

5.1.4 Owner Diversification Constraints. In addition to the limitations on private firms' abilities to raise external capital, owners of private firms may face similar constraints. Selling portions of their holdings can be difficult and costly precisely because shareholders of private firms do not have access to a public capital market for their shares.[16] Therefore, dividends can play a significant role in meeting private owners' diversification and consumption needs.

The key implication of this role for dividends is that private firms' dividends should be higher than those of their public counterparts. We find the opposite result in Table 5, where private firms pay out significantly *less* than their public counterparts. More striking is that Panel B of Table 5 reveals that transition firms pay lower dividends as private entities than as public entities. This behavior is in spite of the sharp increase in liquidity occurring at the time of the IPO. Thus, while diversification motives may be relevant for dividend policy, they are unlikely to be responsible for all of our results.

5.2 Public Firms vs. Private Dispersed Firms

So far our analysis and discussion have been silent on the differences between public firms and private dispersed firms because the differences between these two sets of firms do not lead to obvious theoretical implications. In particular, where one can clearly rank wholly owned firms as having the least amount of information and incentive problems among the three groups, the ranking between private dispersed and public is unclear. On the one hand, there exist for public firms a number of mechanisms designed, at least in part, to protect the interests of outside or minority shareholders. Some examples include additional disclosure requirements, increased accountability for boards of directors, the market for corporate control, and the relative ease with which shareholders can vote with their feet.[17] On the other hand, we recognize the equilibrium nature of ownership structure so that investors in private dispersed

[16] Consistent with this argument, theoretical research suggests that diversification and consumption concerns are motives to go public. For example, see Leland and Pyle (1977) and Zingales (1995).

[17] See Section 3 of the London Stock Exchange Admission and Disclosure Standards, July 2005. London Stock Exchange AIM brochure, p. 6. See the Rules for Issuers on the OFEX website and the Disciplinary and Appeals Handbook available from the London Stock Exchange.

firms may have less need for these external governance mechanisms. For example, investors in private firms, such as employees, family, and institutional investors, may be able to monitor management more easily.

Nonetheless, we do note some significant and interesting distinctions between private dispersed and public firms. In particular, we find that public firms engage in greater dividend smoothing (Table 3) and pay lower dividends (Table 5). We find no significant difference in the sensitivity of dividends to investment opportunities between private dispersed and public firms (Table 6). One possible explanation is that the smoothing and level results are suggestive of an information and liquidity constraint explanation. Specifically, the smoothing results are consistent with public firms facing the smallest of such frictions, followed by private dispersed and then wholly owned. Likewise, the dividend level results suggest a similar ranking of groups in which information and liquidity constraints are increasing from public to private dispersed to wholly owned. As such, wholly owned firms pay a low level of dividends, followed by private dispersed, because external capital is relatively more costly than that of public firms. The cost emanates from liquidity constraints faced by a relatively small pool of potential investors.

Ultimately, the exact theoretical mechanism behind these findings is unclear. Nonetheless, the results are clear in further highlighting the importance of ownership structure for payout policy.

6. Conclusion

Ownership structure and the attendant information environment and incentive conflicts are important for dividend policy. We find a great deal of heterogeneity in dividend policies across public and private firms. Specifically, private firms with dispersed ownership pay lower dividends than public firms with similar characteristics. Similarly, we also find that firms that have transitioned from being private to public also increased their dividends around the transition time. Second, the results suggest that dividend smoothing is closely linked to whether firms are privately or publicly traded. Public firms are more reluctant to cut dividends, and they overall smooth dividends much more than private firms, regardless of their ownership structure.

By examining the behavior of private firms, our study is able to make several key contributions toward understanding how firms choose their dividend policies. One such contribution is to provide explicit evidence that dividend smoothing is directly tied to the scrutiny of the public capital markets. In other words, while market imperfections, such as agency conflicts and information asymmetry, can generate a role for dividend smoothing, there is something inherent in the presence of public capital markets that motivates publicly held firms to smooth their dividends above and beyond what traditional financing frictions would predict.

In contrast, in private firms where ownership concentration is so extreme (e.g., one shareholder, family-run firm, several institutional shareholders) that informational opacity and agency conflicts are largely irrelevant, we observe relatively lower dividend payout rates and a greater sensitivity of dividends to earnings and investment opportunities. In essence, dividend policy for these firms resembles that of a residual financing decision, occurring after the investment decision. This finding is comforting since these firms correspond closely to Jensen and Meckling's (1976) 100% owner-manager firms, in which agency costs are fully internalized.

Looking forward, our evidence also leads to several new questions: What is the mechanism present in public capital markets that is responsible for dividend smoothing? How does the propensity to smooth dividends vary cross-sectionally? We look forward to future research addressing these questions.

Appendix

Appendix A: Data Definitions

All definitions coincide with line items in corporate balance sheets and profit and loss (P&L) accounts and are found in the FAME database.

Operating Profit = Gross Profit – Other Expenses
Capital Investment = (Fixed Assets(t) – Fixed Assets(t–1)) / Fixed Assets(t–1)
Profits = net profit (loss)
Dividends = total dividends paid to shareholders
Assets = book value of total assets
Retained Earnings = profit – dividends – extraordinary items – minority interests
Book Equity = Issued Capital + Total Reserves
Sales Growth = (Sales(t) – Sales(t–1)) / Sales(t−1)
Debt = total debt defined as: Trade Creditors + Short Term Loans + Long Term Debt
Profit Volatility = average within-firm standard deviation of *Profits*

Appendix B: Matching Procedure and Results

We perform two matches: (1) public to private dispersed; and (2) public to wholly owned. The matching procedure that we employ is a one-to-one nearest neighbor matching with replacement, restricting attention to propensity scores falling in the common support of both groups (see Smith and Todd 2005 for details). The matching begins by first estimating a probit regression of an indicator variable equal to one if the firm is in the public category and zero if the firm is in the private dispersed (wholly owned) category.[18] The results of this regression are presented in the pre-match column in Table B1. Panel A presents the results for the public to private dispersed match; Panel B presents the results for the public to wholly owned match.

Both panels illustrate sharp differences between the three groups of firms. Focusing first on Panel A, we see that, on average, public firms are much larger but less profitable and less leveraged than private dispersed firms. Similar relations are found in Panel B comparing public with wholly owned firms. Though not reported, we also find that there are also differences across the three

[18] Using a logit and semiparametric model, as opposed to a probit, leads to qualitatively similar results.

Table B1
Propensity score matching diagnostics

Panel A: Probit Regressions (Public to Private Dispersed)

Variable	Pre-Match	Post-Match
Intercept	−3.12	−0.56
	(0.17)	(0.12)
Log(Assets)	0.39	0.02
	(0.01)	(0.01)
Sale Growth	0.03	0.08
	(0.04)	(0.04)
Profitability	−0.50	0.34
	(0.14)	(0.13)
Leverage	−1.45	0.56
	(0.10)	(0.08)
Control	2,433	3,862
Control (Unique Obs)	2,433	1,127
Treatment	3,997	3,862
Obs	6,430	7,724
Pseudo R^2	0.24	0.02
Chi-Square P-Value	0.00	0.00

(*continued*)

Table B1
Continued

Panel B: Probit Regressions (Public to Wholly Owned)

Variable	Pre-Match	Post-Match
Intercept	−3.52	0.02
	(0.09)	(0.12)
Log(Assets)	0.36	0.00
	(0.01)	(0.01)
Sale Growth	0.12	0.02
	(0.02)	(0.03)
Profitability	−1.13	0.23
	(0.11)	(0.14)
Leverage	−2.22	0.09
	(0.06)	(0.09)
Control	29,256	3,824
Control (Unique Obs)	29,256	2,715
Treatment	3,862	3,824
Obs	33,118	7,648
Pseudo R^2	0.27	0.00
Chi-Square P-Value	0.00	0.03

Panel A presents coefficient estimates from two probit regressions of an indicator variable equal to one if the firm is publicly held. The pre-match specification is estimated on the sample of public and private dispersed firms extracted from all nonfinancial, nonagricultural, and nongovernment firms in the FAME database during the period 1993–2002 that are subject to the audit requirement. The post-match specification is estimated on the matched sample of public and private dispersed firms. Panel B presents similar results for the matching of public firms to wholly owned firms. The three matched samples of firms—Wholly Owned, Private Dispersed, and Public firms—are formally defined in the text. All variables are defined in Appendix A.

groups, in terms of the distribution across industries, which we measure using the twelve Fama and French (2000) industry definitions.[19]

Using the predicted probabilities (i.e., propensity scores) from the estimated probit regressions, we match to each public firm-year observation, the corresponding private dispersed (wholly owned) firm-year observation that minimizes the absolute value of the difference between propensity scores. Because the matching is done with replacement, duplicate observations can result. Indeed, of the 4,093 private dispersed observations matched to the public observations, 1,329 are unique. Similarly, 3,402 of the wholly owned observations matched to the public firms are unique. However, this feature of the matching process improves the accuracy of the matching while sacrificing statistical power. Thus, this feature works against us finding statistically significant differences in our analysis because the number of independent observations is significantly smaller than the literal number of observations.[20]

The post-match columns in Panels A and B illustrate that the matching procedure is successful. Specifically, almost every coefficient experiences a sharp attenuation in magnitude, as well as statistical significance. Additionally, casual inspection of the industry-fixed effects reveals no significant estimates. In fact, the only marginally significant coefficient is that on profitability. However, the pseudo-R^2 suggests that the explanatory power of this specification is 1% for the public versus private dispersed comparison and less than 0.5% for the public versus wholly owned comparison.

Because we often compare the wholly owned firms with the private dispersed firms, we also estimate a probit regression using the post-match samples of these two groups. (The indicator now equals one if the observation corresponds to a private dispersed firm and zero if the observation corresponds to a wholly owned firm.) The results are qualitatively similar to the post-match results presented in Panels A and B and, therefore, are not presented.

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[19] We thank Ken French for providing these data on his website.

[20] As noted in the text, all of our standard errors are computed by clustering at the firm level.

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