Dividend Smoothing, Agency Costs, and Information Asymmetry: Lessons from the Dividend Policies of Private Firms

Roni Michaely
Cornell University and IDC

Michael R. Roberts
The Wharton School, University of Pennsylvania

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Abstract

We compare the dividend policies of publicly- and privately-held firms in order to examine Lintner's (1956) model of dividends, as wells as more recent agency and information-based theories. Our findings suggest that the scrutiny of public capital markets, in conjunction with traditional financing frictions, induce public firms to smooth dividends over time through a policy of gradual increases in dividends, infrequent decreases in dividends, and relative insensitivity of dividends to transitory earnings shocks. Private firms, on the other hand, follow relatively erratic dividend policies that are more sensitive to transitory earnings shocks - both positive and negative. For some private firms, in which sole or family ownership make information and agency concerns largely irrelevant, we find that dividend policy behaves as if a residual financing decision, much like Modigliani and Miller's irrelevance theorem predicts. We also show that the protection of governance mechanisms afforded to shareholders of publicly traded companies results in dividend policies that distribute a relatively large fraction of earnings, and dividends that are more sensitive to variations in investment opportunities relative to otherwise similar private firms for which these mechanism are unavailable to mitigate agency conflicts.

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 (e.g. Allen and Michaely (2003)) and survey evidence (Lintner (1956) and Brav et. al. (2005)) strongly suggest that dividend policy is anything but irrelevant to managers and markets. Rather, corporate dividend policies exhibit very clear tendencies. In particular, dividends are "smoothed," dividends are rarely decreased, and investors react positively to dividend increases and negatively to dividend decreases. While these stylized facts are well-established, the economic mechanism behind these facts - that is, how and why firms decide about a particular dividend policy - is not well understood.

While some studies present tax-based explanations for dividend behavior (e.g., Miller and Scholes (1978)), the most popular explanations come from theories predicated on either information asymmetry or agency problems between managers and shareholders. Under asymmetric information, dividends are used as a signal to convey information about future profitability (e.g., Bhattacharya (1979), Miller and Rock (1985), John and Williams (1985), and Bernheim and Wantz (1995)). In contrast, agency theories suggest that dividends are a means to mitigate perquisite consumption, empire building, or other value-destroying activities (e.g., Jensen and Meckling (1976), Easterbrook (1984), Jensen (1986), La Porta et al. (2000)). While both sets of theories are consistent with the link between dividend changes and the subsequent stock price reaction, other implications for dividend policy emanating from these theories have received mixed empirical support from a number of studies examining the dividend behavior of publicly traded firms.[1]

[1] See Allen and Michaely (2003) for a survey of the relevant empirical (and theoretical) literature.

In this paper, we depart from the strategy of previous empirical studies by comparing the dividend policies of publicly-held firms with those of privately-held firms in the United Kingdom (UK). This approach enables us to make three contributions to the literature examining corporate dividend policy. First, we examine whether Lintner's findings of dividend smoothing are related to whether firms are publicly traded. That is, we test whether capital markets play a role in the decision to smooth dividends. Second, we provide novel evidence on several hypotheses motivated by agency problems and information asymmetry by using a sample where variation in these frictions is extreme relative to previous studies that examine only publicly traded firms. Finally, we provide general insight into the dividend policy of private firms, which have largely been ignored despite their importance to the economy.[2]

We begin by examining ownership data in order to classify firms into three groups differing in their ownership structure and access to public equity markets: (1) privately-held firms in which ownership is concentrated among very few, sometimes only one, shareholders, (2) privately-held firms in which there exists a significant number of minority outside shareholders, and (3) publicly-held firms. These groups form a wide spectrum with respect to the degree of information asymmetry and agency problems between managers and shareholders.

The first group, which we denote "Wholly Owned," is at one end of the spectrum, experiencing little information or agency problems between managers and shareholders, because, in many cases, the shareholder(s) are intimately involved in the operations and management of the firm through positions on the board of directors, through financing arrangements, or even through managerial positions. The second group, "Private Dispersed," is at the other end of the

[2] Over 95% of firms in the UK are privately owned and are responsible for more than half of the UK GDP. Similarly, the US Small Business Administration reports that in 1998 businesses with fewer than 500 employees accounted for more than half of US GDP.

spectrum, suffering from extreme informational opacity and agency conflicts but with relatively little investor protection or recourse against managerial abuses. The third group, "Public," falls in between these two extremes since information and agency problems due to a relatively dispersed ownership structure are partly mitigated by institutional and regulatory structures designed to improve the flow and quality of information while also enforcing investors' rights (see for example, La Porta et al. (2000)).

While the exercise of comparing the dividend policies among these three groups is, in principle, straightforward, a significant challenge in conducting our tests is that firms do not randomly allocate themselves to private and public status. To address this sample selection issue, we conduct all of our analysis on two mutually exclusive samples. Our primary sample is constructed using a propensity score matching technique pioneered by Rosenbaum and Ruben (1983) and further refined by Heckman, Ichimura, and Todd (1997, 1998). Using this technique we match our three sets of firms on several dimensions (e.g., size, sales growth, profitability, etc.), which enables us to better isolate the potential cause of any differences in dividend policy. Our secondary sample consists of firms that undergo a transition from private to public status (or vice versa). For this sample, we compare the within firm variation in dividend policies before and after the transition, while simultaneously controlling for changes in other dividend-related aspects of the firm. While neither sample can be considered as randomly assigning firms to public and private status, both take significant, but very different, strides towards that ideal. Thus, our conclusions are based on results that hold for both samples.

Our first set of results reveals the following insights on dividend smoothing and Lintner's (1956) behavioral model of dividend policy. First, we confirm that Public firms are strongly averse to omitting or cutting dividends, and significantly more so 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 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.

Our central test of Lintner's smoothing hypothesis involves estimating the response of firms' dividend policies to transitory earnings shocks. We do so by estimating the partial adjustment specification suggested by Lintner (1956), and subsequently used by Fama and Babiak (1968) and Brav et al. (2005). The results are illustrated in Figure 2, which show the dynamic response of dividends, scaled by their estimated target payout ratio, to a temporary £1 earnings shock.

Wholly Owned firms immediately distribute over £0.29 of the £1 shock. Relative to their target payout ratio (i.e., dividends paid divided by earnings) of 0.32, 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 earnings shock. Private Dispersed firms, on the other hand, distribute less than £0.10 of the £1 earnings shock in the initial period. However, relative to their target payout ratio, 0.14, this distribution corresponds to an increase in dividends of approximately 65% associated with the transitory earnings shock, which has little effect on dividends after four years. Finally, we see that public firms distribute just under £0.09 of the £1 earnings shock in the initial period. However, relative to their target payout ratio of 0.20, this distribution corresponds to an increase in dividends of only 41% associated with the transitory earnings shock, which now has a significant impact on dividend policy for over six years. Thus, Public firms' dividend policies are relatively insensitive to transitory earnings shocks that they smooth over long periods of time, in contrast to both sets of private firms.

Our second set of results provides support for the view that agency considerations play an important role in determining the level of dividends. We find that public firms distribute an average of 29% of their profits in dividends, compared to only 17% of profits distributed in dividends by Private Dispersed firms. This finding is consistent with the "outcome" agency hypothesis proposed by La Porta et al. (2000), which predicts that greater investor protection – due to stronger governance structures, regulatory environments, and legal recourse - affords public shareholders a greater "power" over management to extract free cash flow through dividend payments.

Reinforcing this outcome agency view, we also find that Public firms' dividends are more sensitive to investment needs than Private Dispersed firms' dividends: When the need for cash is low, shareholders of Public firms can induce management to distribute excess cash whereas the shareholders of Private Dispersed firms cannot. Additionally, the sensitivity of dividends to investment is greatest when we focus attention on Wholly Owned firms, reaffirming the interpretation of their dividend policies as most closely resembling the residual financing decision predicted by Miller and Modigliani (1961). Thus, with relatively more power conferred through greater investor protection, shareholders of Public firms are willing to accept lower dividend payments from firms with high investment opportunities because they can most likely extract future profits - in contrast to the shareholders of Private Dispersed firms.[3]

Our final set of results examine an alternative view supported by signaling theories (e.g., Bhattacharya (1979)), which suggests that firms subject to tighter regulations and monitoring have a lower need for paying dividends, either because of fewer agency conflicts or because or lower benefits from signaling through dividends. We find, at best, weak support for this

3 In a recent paper, Renneboog and Szilagyi (2006) shows and firms with weak investors' protection in the Netherlands pay lower dividends

hypothesis. Not only do Private Dispersed firms pay lower dividends, on average, than Public firms, but the dividends of Private Dispersed firms have no predictive ability for future profits. That is, dividends do not appear to signal any future changes in profitability, even in firms for which informational opacity is extreme. This result is similar to that found in studies using US data (e.g., Grullon, Michaely, and Swaminathan (2002)) and casts further doubt on the ability of signaling theories to explain the observed behavior.

The remainder of the paper is organized as follows. Section I begins by discussing the relevant differences between public and private firms used to motivate the three groups of firms that we examine throughout the study. This section continues by developing the hypotheses that we test in the context of theoretical arguments and existing empirical evidence. Section II describes the data, our sample selection, and provides summary statistics. Section III presents the primary results of the paper, including the empirical tests of the hypotheses outlined in Section I. Section IV presents further discussion aimed at addressing alternative explanations for the results based on taxes and transaction costs. Section V concludes.

I. Background and Hypothesis Development

As mentioned above, theories of dividend behavior are often predicated on the degree of information asymmetry and/or the extent of agency conflicts between managers and shareholders. For this reason, it is crucial to understand how these frictions vary across public and private firms. Thus, before turning to the development of our hypotheses, we discuss the key distinctions between these two sets of firms and how they impact information asymmetry and agency conflicts. While taxes and transaction costs can also affect dividend policy, we postpone

a discussion of these alternative hypotheses until Section IV in order to maintain focus on the salient issues.

A. Public versus Private Firms

The first relevant difference between public and private firms is the power afforded to outside shareholders by institutional and governance mechanisms. More precisely, there exist a number of institutional and governance mechanisms designed, at least in part, to protect the interests of outside shareholders of public companies. For example, all exchanges in the UK (as well as US) impose strict disclosure requirements on listed firms, above and beyond the reporting requirements faced by all firms (public and private) under the Companies Act. Firms listed on the London Stock exchange are subject to arbitrary information and explanation requests by the Exchange to ensure firms are adhering to the Disclosure Standards. Firms are also required to inform the stock exchange of any announcement affecting the rights of existing shareholders, as well as to provide a timetable for all dividends and interest payments.[4]

Similarly, boards of directors of public firms also "face increased accountability for key management decisions and actions and must ensure that they run the company in the interests of shareholders."[5] Additionally, exchanges have authority to sanction and discipline any company contravening the rules and standards set forth by the exchange.[6] Outside of institutional protection, the market for corporate control also affords shareholders of public firms the ability

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

to potentially remove inefficient management through proxy fights and takeover contests (See for example, Becht, Bolton, and Roell (2003)).

Each of these mechanisms is largely unique to public firms and, in concert, helps to ease the monitoring and discipline of managers. By doing so, these mechanisms afford outside shareholders in such firms with a certain amount of "power" (La Porta et al. (2000)) over managerial actions. In turn, this power partly mitigates the information and agency problems experienced by the dispersed shareholder base in most public firms. Thus, while information and agency problems are an inherent feature of public firms with their broad-based ownership structures, the many institutions and governance mechanisms surrounding these firms work to offset these problems, at least to a degree.

However, before drawing any conclusions regarding the extent of information and agency problems in public vis a vis private firms, one must recognize that some private firms contain few, if any, minority outside shareholders – the second distinction from public firms. While we discuss the data in detail below, we note that some private firms are family controlled – owned exclusively by one or more family members. Other private firms are entirely owned by one entity (e.g., individual, corporation, financial institution). Outside shareholder(s) of these firms often have a significant interest and expertise in the operations of the firm and, as such, play an active role in the firm's operations through positions on the board of directors, indirect monitoring, and direct contact with management. For these types of private firms, the power afforded to outside shareholders via ownership concentration, expertise, and active monitoring, is, arguably, significantly greater than that provided to outside shareholders of public firms by the institutional and governance mechanisms discussed above.

Therefore we focus on three groups of firms that are distinguished by the extent of information asymmetry and agency problems between managers and outside shareholders. Our construction of these groups is driven by ownership classifications contained in our data and is discussed in detail in Appendix B. The first group of firms is denoted "Wholly Owned" and is defined as privately-held firms in which there are fewer than five shareholders. These firms are characterized by extremely concentrated ownership, such as sole proprietorships and family-owned firms, and suffer from relatively small information and agency problems because of their often active involvement in the operations of the firm. The second group of firms is denoted "Private-Dispersed" and is defined as privately-held firms whose shareholders are "too numerous" to list by Bureau Van Dijk, the data provider, and in which no single shareholder owns over 50% of the outstanding shares. These firms are characterized by relatively dispersed ownership, as in companies with employee stock participation plans, and suffer from relatively large information and agency problems due to the combination of dispersed ownership with a lack of investor protection. The final group of firms is denoted "Public" and consists of all publicly-held firms. These firms, in spite of their dispersed ownership, suffer from moderate information and agency problems because of the institutional and governance mechanisms discussed above. Thus, these three groups of firms form a spectrum of information asymmetry and agency problems: low (Wholly Owned), medium (Public), and high (Private-Dispersed). This spectrum is illustrated in Figure 1 for reference.

B. Dividend Smoothing

In his seminal paper, Lintner (1956) surveyed managers on their attitudes toward dividend policy and concluded that managers target a long-term payout ratio. He also found that

dividends are sticky, tied to long-term sustainable earnings, paid by mature companies, and are smoothed from year to year. These findings have since been confirmed with more recent empirical evidence examining dividend data (Fama and Babiak (1968) and Brav et al. (2005)), as well as new survey evidence (Brav et al. (2005)).

Despite the robustness of these empirical findings, neither Lintner (1956) nor the literature that followed have 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 reasons to believe 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 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 find the consequences of dividend cuts and omissions to be less severe than their public counterparts, primarily because of differences in informational content. Brav et al. also report that private firms are less likely to pay dividends in lieu of investing and that they are more likely to pay dividends in response to temporary changes in earnings. Thus, while there is suggestive evidence on the importance of public capital markets in shaping dividend policy, there has yet to be any direct evidence on its relevance.

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. 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/absence of public capital markets, it is also possible that smoothing is, at least in part, related to agency issues or asymmetric information. 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 will correspond most closely to that predicted by Modigliani and Miller'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.

We summarize this discussion in the following two hypotheses.

Hypothesis 1:

> Public firms are the least likely to alter (increase, decrease, initiate, omit) their dividends, followed by Private-Dispersed firms, and then Wholly Owned firms, who are the most likely to alter their dividends.

Hypothesis 2:

> Public firms are the most likely to smooth dividends, followed by Private-Dispersed firms, and then Wholly Owned firms, who are the least likely to smooth dividends.

C. Agency Problems

Berle and Means (1932), Jensen and Meckling (1976), and Shleifer and Vishny (1986), among others, identify the importance of agency problems in analyzing the structure and value of corporations. One dimension of conflict in a corporate setting is the link between insiders (i.e., managers) and outside shareholders. Management has an incentive to divert resources from outside shareholders by investing in unprofitable projects (e.g., empire building), perquisite consumption, and even outright theft (see, e.g., Jensen (1986)). Because the relationship between insiders and outsiders and the attendant governance mechanisms vary widely across our three groups of firms, the potential agency costs vary as well. Thus, we examine two implications of agency theory for dividend policy.

The first implication concerns the level of dividend payments. Grossman and Hart (1980), Easterbrook (1984), and Jensen (1986) suggest that dividends payments can, at least partially, solve the agency conflict between shareholders and managers first identified by Jensen and Meckling (1976). By minimizing the cash that management controls, dividends make it more difficult for management to expropriate shareholder wealth through unmonitored activities. The extent of this expropriation is a function of two considerations: (1) the alignment of incentives between managers and shareholders, and (2) the ability of shareholders to observe and take recourse against any expropriation.

These two considerations, in light of earlier discussions, suggest that Wholly Owned firms, for which the incentives between management and shareholders are relatively closely aligned, should pay relatively high dividends. Private Dispersed firms, on the other hand, should pay relatively low dividends. This conjecture follows for two reasons. First, there is a relatively sharp misalignment of incentives between managers and shareholders in these firms. Second,

shareholders in these firms have few resources available to detect expropriation and relatively little recourse against expropriation because these shareholders are afforded relative little protection. This situation is in contrast to Public firms, whose shareholders can exert power, in the sense of La Porta et al. (2000), over the firm's management because of the many governance mechanisms afforded to them by the firm's public status. To be clear, shareholders of Public firms do not have an explicit right to dividends per se but rather they have more general rights in terms of voting for directors and protesting wealth destroying activities. As such, Public firms commit ex-ante to not undertake value-destroying actions by eliminating excess cash through dividend payments.

Hence, we have the following hypothesis:

Hypothesis 3:

> Public and Wholly Owned firms should pay higher dividends than Private Dispersed firms.

The agency theory does not produce a clear prediction about the level of dividends paid by Public firms relative to Wholly Owned firms: On the one hand Public firms have more enforcement mechanisms; on the other hand, Wholly Owned firms have lower agency problems.

Continuing on the agency theme, Wholly Owned firms should exhibit the greatest sensitivity between investment and dividends, if dividends for this group are closest to behaving like the residual in firms' decisions. Specifically, dividends are reduced when investment opportunities abound and increased when investment opportunities shrink. This sensitivity is driven by the assumption that shareholders in Wholly Owned firms are confident that managers are making positive NPV investment and, therefore, a reduction in dividends is coincides with an increase in shareholder value. We also expect Public firms to exhibit a similar sensitivity to

investment, at least in direction if not magnitude, whereas Private Dispersed firms should exhibit a relatively lower sensitivity to investment opportunities. This last relation also follows from the outcome agency hypothesis of La Porta et al. (2000), who suggest that better protected investors (i.e., shareholders of Public firms) will compel managers to pay higher dividends when growth opportunities are low and vice versa. This discussion leads to the following hypothesis.

Hypothesis 4:

> Wholly Owned firms' dividends should exhibit the greatest sensitivity to investment opportunities, followed by Public firms' dividends, and then Private Dispersed firms' dividends, which should exhibit relatively little sensitivity to investment opportunities.

D. Signaling Theories

Dividend signaling models such as Bhattacharya (1979), Bernheim and Wantz (1995) and reputation arguments such as Gomes (2000) and La Porta et al. (2000) suggest an alternative explanation for observed dividend policies: Because private firms have a weaker governance structure, maintaining one's reputation and conveying quality is even more important. One vehicle to gain (or maintain) reputation is by paying dividends. Following La Porta et al. (2000), we label this alternative as "the substitute model" where firms substitute between the external monitoring that is associated with being a public firm and the self-imposed monitoring of dividends. Then, relative to public firms, private firms have a greater incentive to pay dividends to distinguish themselves from their peers. Public firms, who are subject to the scrutiny of the capital markets, have less need to use dividends to signal their quality. Thus, we have an

alternative to hypothesis 3: Wholly Owned firms pay the smallest dividends, followed by Public firms and then Private Dispersed firms who pay the largest dividends.[7]

Another important implication of most signaling models is that firms that signal their quality (through dividend payments) will subsequently experience better performance (e.g., Benartzi, Michaely, and Thaler (1997)). Thus, we should see a monotonic increase in the predictive ability of dividend changes for future earnings changes as we move from Wholly Owned firms to Public firms to Private Dispersed firms, where signaling will be most important.

Hypothesis 5:

> Following dividend increases, operating performance should improve for Private Dispersed firms and Public firms but there should be little or no relation between dividend increases and operating performance for Wholly Owned firms.

II. Data and Sample Selection

A. 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. Our extract from this database encompasses a ten-year period covering 1993-2002 and our general sample frame definition follows closely that found in Brav (2005a, 2005b). A number of different types of entities are contained in the FAME database. We focus on private limited and public quoted firms.[8] We exclude assurance companies, guarantees, limited liability partnerships, public investment trusts,

[7] The substitute model also suggests that high growth firms may have a stronger incentive to establish a reputation since they have a greater potential need for external finance, but this relation is offset by the higher marginal benefit of internal funds experienced by firms with better investment opportunities and, thus, the association is ambiguous.
[8] Public quoted includes firms quoted on the London Stock Exchange, OFEX, and AIM.

and "other" types. We do so to ensure that our sample contains only limited liability 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 only required to file abridged statements. This leads to a large number of missing data values, especially for small firms that only need to file 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 of 2000 and £1 million thereafter. Thus, to minimize missing data and ensure the validity of the data, we impose several size-related criteria in drawing our sample.

First, we exclude firms that do not satisfy the auditing requirements. Second, we exclude all small firms, as defined by Companies House – an executive agency of the UK Department of Trade and Industry. A firm is classified as small if two of the 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. Another motivation behind these selection criteria is that they help mitigate - 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 (US SIC codes between 6000 and 6999), utilities (US SIC codes between 4900

and 4939), agricultural firms (US SIC codes less than 1000), and public sector firms (US SIC codes greater than 8999).

Table 1 presents summary statistics for our sample, as well as a similar sample of US firms during the period 1993 to 2002 drawn from the Compustat database (all dollar amounts are converted to real GBPs using the calendar year-end exchange rate and UK CPI). Variations in the number of observations for each variable reflect missing data and figures in brackets are medians. All variables in the Table (and throughout the paper) are formally defined in Appendix A.

Focusing on the UK firms from FAME in Panel A, we see that public firms are approximately ten times larger than private firms both in terms of averages and medians. Public firms also invest more, have relatively more tangible assets, 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 levered. A comparison of Public firms across countries shows that the median firm in both countries is similar in size, though the US has a significantly larger number of very small firms and relatively few very large firms. On average, US firms invest at a lower rate, are less levered and less profitable, and less likely to pay a dividend. Though, most of these findings are largely a consequence of the different size-growth composition of US firms relative to UK firms.

B. 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 likely correlated with firms'

dividend policies. We take two approaches to address this concern, resulting in two distinct samples on which we focus our analysis.

B.1 The Transition Sample

The first approach involves looking at a subsample of the data in which firms undergo a transition in ownership status from private to public or vice versa. To do so, we gather data on initial public offerings (IPOs) and going-private transactions that occur during our sample period. This data comes from two sources: SDC Platinum from Thompson and Zephyr from Bureau Van Dijk. From SDC, we extract all IPOs on the LSE and going-private transactions occurring during our sample period. However, since SDCs coverage of the United Kingdom is incomplete, we compliment this with data from Zephyr, which starts coverage of the UK in 1997.[9] 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.

This data on IPOs and going-private transactions serves two purposes. First, it eliminates measurement error in our classification of public and private firms. The public or private status of a particular firm in the FAME database is a "static" variable, containing information only at the time of the extract - 2002. Thus, if a firm goes public (or private) at some point during the sample period, using only the FAME data would lead to an incorrect classification of the firm as being public or private for the entire sample period. Second, identifying what we will refer to as "Transition" firms directly addresses the sample selection issue because our analysis of these firms take a firm fixed-effects approach, thereby examining only the within firm behavior as both a private and public entity.

[9] We thank Omer Brav for the use of his data from SDC and Zephyr that identifies IPOs and buyouts during our sample horizon.

A limitation of this sample, however, is a lack of historical information on the ownership structure of these firms. This dearth of information makes classifying these firms - the bulk of which transition from private to public - into the two groups discussed earlier difficult.[10] However, there are at least two reasons to believe that the ownership structure of the transition firms as private entities is best classified as Private Dispersed, according to the definition given earlier and detailed in Appendix B. First, the large majority (> 90%) of private to public transition firms are true IPOs, not spin-offs of previously wholly owned divisions. Second, evidence from the US during our sample horizon suggests that CEOs owned, on average, only 21% of pre-IPO shares outstanding (Ljunqvist and Wilhelm (2003)). Additionally, Ljungqvist and Wilhelm (2003) also show that institutional investor ownership shares ranged from 14% to 40%, while other corporate shareholders, when present, held stakes of approximately 30% to 40%. While US ownership structure is only a proxy for our UK firms, Acharya, John, and Sundaram (2005) note that the US and UK share many commonalities in terms of capital markets (if not bankruptcy law). Thus, by our criteria, the majority of transition firms, as private entities, would fall comfortably into the classification Private Dispersed.

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. Finally, as private firms, median sales growth is lower, though average sales growth is higher. 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.

[10] The details of the ownership data and classification are presented in Appendix B.

B.2 The Matched Sample

While addressing one sample selection issue, the Transition firms raise another. Specifically, the decision to go public or private is unique and, thus, these firms may not represent the more general population of public and private firms.[11] As such, 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.

The second approach to addressing sample selection concerns involves forming a matched sample of public and private firms using a propensity score matching algorithm developed by Rosenbaum and Rubin (1983, 1985) and extended by Heckman and Robb (1986) and Heckman, Ichimura, and Todd (1997, 1998). 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., Rubin (1997), 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). 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 (over 130,000 firm-year observations), 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

[11] Teoh, Welch, and Wong (1998) also suggest that IPO firms are susceptible to earnings management.

based in the United Kingdom and subject to the same reporting requirements for the data used in this study.[12]

Because we look at three groups of firms, we perform two separate matches. First, we match Public firm-year observations to Private Dispersed firm-year observations, restricting attention to only those observations within the common support of estimated propensity scores (Smith and Todd (2003)). Practically speaking, this restriction has little effect – 0.5% of the Public and 0.1% of the Private Dispersed firm-year observations are excluded from the matching, respectively. We then match the Public firm-year observations to Wholly Owned firm-year observations, again imposing the common support restriction. In this second match, 1.7% of the Wholly Owned and none of the Public firm-year observations are excluded. Throughout the matching process, we exclude all Transition firms.

The details of each matching procedure are as follows. We begin by estimating a probit regression of an indicator variable for the firm's ownership status on firm characteristics.[13] We focus on characteristics most likely to distinguish public and private firms: firm size, sales growth, profitability, and leverage. Other features, such as ownership structure and industry are addressed explicitly in the analysis below. While this list of factors is far from exhaustive, it represents a tradeoff in terms of model parsimony and an accurate specification. More factors may lead to more accurate matches but at the expense of fewer matches. Fewer factors lead to more matches but at the expense of less accurate matches. The probit results presented in the first column of Panel A in Table 2, "Pre-Match," suggest that they are all – but for sales growth - statistically and economically important factors in the distinction between Public and Private

[12] Other studies in economics and finance using the matching approach used here include McMillen and McDonald (2002), Blundell et al. (2000), and Drucker and Puri (2005).
[13] In unreported results, we also use a logit and semi-parametric model. Neither of these modifications to the matching procedure had a significant effect on our results.

Dispersed firms. The results highlight that public firms are, on average, larger, less profitable, and less levered, consistent with the bivariate mean comparisons in Panel A of Table 1. We also note that the pseudo-R-square is 58%, suggesting that the specification offers a significant improvement over a benchmark intercept model.

Using the estimated probit model, we compute predicted probabilities, or propensity scores, for every firm-year observation in the sample with non-missing values for the variables in the probit model. We then match each Public firm-year observation to a Private Dispersed firm-year observation by minimizing the absolute difference in the observations' propensity scores. This creates a matched sample of 4,101 Public and 1,425 Private Dispersed firm-year observations. The number of Private Dispersed firm-year observations is less than the number of Public firm-year observations because we perform the matching with replacement, as suggested by Dehejia and Wahba (2002) and Smith and Todd (2003). Doing so, ensures more accurate matching but at the expense of decreased power because of fewer unique observations.

To check the accuracy of our matching procedure, we re-estimate the original probit specification on the matched sample. The results are presented in the second column of Panel A and reveal a significant attenuation in every coefficient, as well as the pseudo-R-square, which is now only 9%. That said, there are still statistically significant differences between the two samples in terms of size and leverage. Panel B of Table 2 presents similar findings in the matching of Public firms to Wholly Owned firms, which identifies 3,473 suitable Wholly Owned firm-year observations. Specifically, prior to matching, Public and Wholly Owned firms differ across all four dimensions in an economic and statistically significant manner. However, after matching, all associations are statistically insignificant, but for size. Indeed, the pseudo-R-square

is less than 1%. Overall, the matching procedure results in relatively homogenous samples, at least across the observable characteristics on which we focus.

That said, the statistically significant differences in size and leverage motivate us to perform two additional analyses. The first examines a subsample of the matched samples for which there are no statistically significant differences among any of the firm characteristics used in the matching process. The second examines the matched sample but incorporates size and leverage controls into all of the subsequent analysis. The results of these two analyses are qualitatively similar to those obtained using the entire matched samples without any controls. As such, we suppress the results from the alternative analyses and focus on those obtained with the entire matched sample.

III. Results

A. Dividend Smoothing

Table 3 provides a detailed analysis of public and private firms' policies towards changing dividends. Hypothesis 1 contends that Public firms are the least likely to change their dividends in a given year, followed by Private Dispersed firms, and then Wholly Owned firms, which are the most likely to change their dividends. 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 9.0% of the time, Private Dispersed firms omit a dividend 4.8% of the times, and Public firms omit a dividend only 3.7% of the time. 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 heteroskedasticity (Petersen (2005)). Consistent with Hypothesis 1, these tests show that Wholly Owned firms are more than twice as likely to omit a dividend relative to Public firms. Likewise Private Dispersed are almost 30% more likely to omit a dividend relative to Public firms. The corresponding t-statistics show that these differences are statistically significant, as well.

The next row examines the propensity to cut dividends, defined as a firm-year observation in which the change in dividend is negative.[14] We find a similar pattern for dividend cuts: Wholly-owned firms cut their dividends significantly more frequently than Private Dispersed or Public firms and Private Dispersed firms cut their dividends significantly more frequently than Public firms. Again, both pairwise differences are statistically significant. Finally, conditional on cutting dividends, Wholly Owned firms decrease their dividend 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, 8.8% of Wholly Owned firms initiate dividends compared with 5.7% of Private Dispersed firms and only 3.0% of Public firms – each estimate significantly different from one another.

Our next result is that Public firms are more likely to increase dividends than private firms: Public firms increase their dividends 64% of the time, relative to 43.4% for Private Dispersed and only 28.7% for Wholly Owned. Given the argument that private firm are more

[14] We note that this definition of a dividend cut may be somewhat misleading because of share repurchases, which can be substituted for dividend payments (Grullon and Michaely (2002)). However, because share repurchases are less relevant for private firms, any bias stemming from this definition will tend to inflate the relative propensity with which public firms cut dividends, working *against* the relations that we observe in Table 3.

likely to change dividends; at a first glance this results might seem surprising. However, the relative magnitudes of dividend increases exhibit precisely the opposite pattern, consistent with Lintner's hypothesis. Specifically, the magnitude of Public firms' dividend increases are approximately one quarter the size of Private Dispersed firms and one fifth the size of Wholly Owned firms. 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 at least doubling one's dividend is 9.6%, 14%, and 21.4%, respectively, with all pair wise differences being statistically significant. Thus, while Public firms increase dividends more frequency, they do so in much smaller amounts.

Panel B presents results for our sample of Transition firms, all of which are consistent with the findings in Panel A. The results illustrate that when Private, firms are more likely to omit, decrease, and initiate a dividend than when they are Public. However, as Public entities, firms are more likely increase their dividend, although these increases are significantly smaller than increases as Private firms.

In sum, the results of Table 2 lead to the following conclusions. Public firms are averse to omitting, cutting, and initiating dividends relative to otherwise similar Private firms (both Private Dispersed and Wholly Owned). Public firms are also more averse to large dividend increases than their private counterparts. These findings suggest that the scrutiny of public equity markets appears to induce managers to follow a policy of relatively small, consistent increases in dividends, while avoiding any reduction in dividends. In contrast, dividend increases appear less frequently and more erratic, in terms of the magnitude of the increase, for Private Dispersed and Wholly Owned firms.

Turning to Hypothesis 2, we now examine the response of firms' dividend policies to transitory earnings shocks. According to this hypothesis, Public firms are the most likely to smooth dividends by exhibiting a low sensitivity to transitory earnings shocks, followed by Private Dispersed firms, and then Wholly Owned firms. There is indirect evidence consistent with this conjecture in Table 3: 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. Table 4 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:

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

where $\Delta Dividend_{it}$ is the change in dividend for firm *i* from period *t-1* to *t*, $Profit_{it}$ is the net profit (loss), and ε_{it} is a random error term. Intuitively, Lintner's model implies that firms have a target payout that is a fraction, β_i, of their profits. Any difference between last period's dividends and this target is reduced by a fraction, λ_i, each period. We refer to β as the target payout ratio or "TP" and λ as the speed of adjustment or "SOA." This latter parameter corresponds to the response of firms' dividend policies to transitory earnings shocks. Large values for the SOA suggest an erratic dividend policy characterized by large changes driven by transitory shocks. Conversely, small values for the SOA suggest a smooth, persistent dividend policy characterized by insensitivity to transitory earnings shocks and a desire to smooth the shock over many periods.

We estimate the model in equation (1) separately for each firm and then presenting the distribution of resulting parameter estimates.[15] 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 heteroskedasticity and confounding scale effects, we run weighted regressions using the inverse of total assets as the weight.[16]

Table 4 presents the distribution and summary statistics of the coefficient estimates for each of the three groups of firms. We see a monotonic decline in the average speed of adjustment moving from Wholly Owned firms (0.92) to Private Dispersed firms (0.65) to Public firms (0.41). (Median estimates of this parameter show a similar relation.) These estimates imply that the dividend policies of Wholly Owned firms are highly sensitive to transitory earnings shocks, followed by Private Dispersed firms, and, finally, Public firms, whose dividend policies are relatively insensitive to such shocks.

These results are illustrated in Figure 2, 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 32% (see Table 4). Immediately after a £1 shock to Profits, Wholly Owned firms distribute approximately £0.29 of the additional earnings to shareholders through an increase in dividends. Relative to the target payout ratio, this corresponds to a 92% distribution, which is the estimated speed of adjustment. This implies that

[15] Estimating this model poses several econometric challenges (Arellano and Bond (1991) and 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 unrealistic parameter estimates.

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

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 £0.09 of the £1 earnings shock in the initial period. However, relative to their target payout ratio, 14%, this distribution corresponds to an immediate increase in dividends of approximately 65% in response to the shock. After only four years, the effect of the earnings shock is effectively gone. Finally, Public firms distribute £0.09 of the £1 earnings shock in the initial period. Relative to their target payout ratio, 20%, 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 hypothesis 2, as well as our earlier findings in Table 3. Recall that in Table 3, 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 Table 4 and Figure 2. 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 exhibit *greater* within firm variation for Public firms when compared to both sets of Private firms, consistent with the summary statistics presented in Table 1.

These findings shed new light on Linter'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. However, in Private Dispersed and Public firms,

where such frictions are present, there is 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. These frictions imply a specific ranking among the three groups (recall Figure 1) according to the severity of these frictions: Wholly Owned (least severe), Public, and Private Dispersed (most severe). Our results in Tables 3 and 4; however, do not strictly abide by this ranking. Specifically, Public firms smooth their dividends the most, followed by Private Dispersed firms, and then Wholly Owned firms. Thus, information and agency explanations can be responsible for only a part of the motivation behind dividend smoothing. The remainder appears to come from a feature unique to public capital markets.

B. Agency Concerns

We now turn our attention to the relevance of agency concerns for dividend policy by examining Hypotheses 3 and 4. To avoid redundancy and ease the presentation of results, we focus our discussion on the analysis of the ratio of dividends to operating profits. This normalization leads to a natural interpretation of this measure as the payout ratio. However, in unreported results, we also replicate our analyses using measures of dividends normalized by total assets and sales, neither of which has any effect on our inferences.

We begin with Hypothesis 3, which states that because of better governance Public firms will pay higher dividends than Private Dispersed firms. Private firms will also distribute less than Wholly Owned firms because of greater agency conflicts. Panel A of Table 5 examines this hypothesis in the Matched sample of firms. Consistent with this conjecture, Wholly Owned firms' average payout ratio is 25.2%; Public firms' average payout ratio is 28.9%; and, Private

Dispersed firms' average payout ratio is only 16.9%. These differences are economically and statistically significant.

Panel B of Table 5 performs a similar comparison for the Transition sample, finding that firms tend to pay relatively higher dividends, on average, when they are public than when they are private. 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. Thus, in Panel C, we estimate a firm-fixed effect regression containing the controls that we use in the matching procedure to better isolate the marginal effect of being public. Again, we see that Public firms pay out a significantly higher share of profits in the form of dividends. However, the magnitude of the difference, perhaps not surprisingly (Grilliches and Mairesse (1995)), is smaller that that found in Panel B.

Because Wholly Owned firms experience relatively few agency problems, their dividends should be more heavily influenced by their need for cash. As such, Hypothesis 4 contends that Wholly Owned firms' dividends should exhibit the highest sensitivity to investment opportunities, followed by Public firms' dividends, and then Private Dispersed firms' dividends, which should exhibit relatively little sensitivity to investment opportunities. To test this hypothesis, we follow La Porta et al. (2000) by examining a regression of dividends in year t, (normalized by operating profits) on several control variables and a measure of investment opportunities, one-year future sales growth (in year t+1). We use a forward looking proxy for investment opportunities for several reasons. Lagged values of sales growth are more reflective of past profitability than future investment opportunities. Second, in so far 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. To further ease comparisons, and address additional heterogeneity concerns, we also industry-adjust the dependent and independent variables by subtracting off industry specific means from each observation, where industry is defined by Fama and French 12 industries.[17] The results are presented in Table 6.

We begin in Panel A, which presents OLS estimates for the three groups of firms from the Matched sample. Focusing on the estimated coefficient on sales growth, we see that Wholly Owned firms exhibit the highest – in magnitude – sensitivity (-0.11 with a t-stat of 2.3), followed by Public firms (-0.08 with a t-stat of 3.8), and finally Private Dispersed firms (0.063 with a t-stat of 1.5), who show no statistically significant association between the level of dividends and investment opportunities. The results suggest that high growth Public firms pay, on average, lower dividends than otherwise similar low growth Public firms. In contrast, high growth Private Dispersed firms pay, on average, dividends that are statistically indistinguishable from those paid by low growth Private Dispersed firms.

This finding is consistent with the prediction of Hypothesis 4, as well as the findings in La Porta et al. (2000). Governance mechanisms in Public firms seem to protect and empower outside shareholders in such a manner as to meaningfully affect corporate dividend policies. More precisely, these governance mechanisms enable outside shareholders to induce managers to disgorge cash when profitable investment opportunities are low. Likewise, they enable managers to retain cash for profitable investment opportunities when such opportunities are high. Hence, the dividend policies of public firms are more sensitive to investment opportunities than that of private firms.

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

The results for Wholly Owned firms only serve to reinforce this interpretation. Wholly Owned firms', who suffer the fewest agency problems, exhibit the highest sensitivity to investment needs. Thus, dividends are strongly negatively correlated with investment opportunities for those firms where agency problems are largely irrelevant.

Panel B reports the result of a similar analysis on the Transition firms. We see that the dividends of firms as Public entities are significantly negatively correlated with investment opportunities, whereas there is no significant association for these firms as private entities. This finding is not only consistent with the results in Panel A, but also with our conjecture that the most likely ownership classification for these firms as private entities is Private Dispersed.

In sum, our findings are largely consistent with the predictions of the outcome agency theory put forth by La Porta et al. (2000). In particular, agency problems and the importance of investor protection appear to be particularly relevant for dividend policy. In the base-case, when there are no agency problems (the Wholly Owned sample), dividends are highly sensitive to changes in investments: When cash is needed dividends decrease, and when cash is not needed dividends increase. When agency problems become relevant (Private Dispersed and Public samples), we find that governance mechanisms that protect Public firms' investors appear to empower these investors to sway managers to disgorge cash when growth opportunities are low and, analogously, to trust managers to retain cash when growth opportunities are high. Without these mechanisms in place (Private Dispersed sample), outside investors' ability to affect managements' actions appears significantly more limited.

C. Signaling

The results presented thus far contains several features related to dividend signaling theories. First, according to these theories, Private Dispersed firms - the most informationally opaque group – should distribute a larger portion of their profits as dividends relative to both Wholly Owned and Public firms. However, this prediction of signaling theory is rejected by the evidence presented in Table 5, showing that Private Dispersed firms, on average, pay the lowest amount of dividends. Second, As Kumar (1988) suggests, dividend smoothing should be monotonically related to information asymmetry. We find limited evidence that asymmetric information is an important factor behind dividend smoothing since information asymmetry does not appear to be monotonically related to dividend smoothing.

We now examine more closely a third prediction of signaling theories, summarized by Hypothesis 5, which suggests that firms that pay dividends, and, in particular, firms that increase their dividends, are firms that are undervalued by the market. Thus, a prediction common to all dividend signaling models is that dividend increases convey good news about the firm's future cash flows. That is, operating performance should improve following dividend increases. Following work by Fama and French (2000) and Grullon, Michaely, and Swaminathan (2002), we estimate predictive models of the change in earnings. We look at two types of predictive models, linear and nonlinear, over two different forecasting horizons, one and two years.

Panel A of Table 7 present results from the linear partial adjustment model (Benartzi, Michaely, and Thaler (1997) and Nissim and Ziv (2000)) and Panel B presents the results for the non-linear model (Benartzi et al. (2005)). It is reassuring to observe that when no asymmetric information exists (Wholly-owned firms), firms do not attempt to signal future change in earnings by dividend increases. However, even when asymmetric information is severe (Private Dispersed firms), there is no evidence that firms signal future change in earnings by dividend

increases. At the one-year horizon, there is some evidence of predictability of positive earnings changes by positive dividend changes among Public firms, but this result disappears when we account for non-linearity. Thus, positive changes in dividends in period *t* do not appear to contain information about positive changes in earnings in the periods to follow.

The results for dividend decreases suggest a perverse relation where dividend decreases are associated with subsequent earning increases in the following year (for Public firms): while this is clearly inconsistent with signaling theories, it is consistent with prior empirical evidence which uses US data (Healy and Palepu (1988) and Benartzi, Michaely, and Thaler (1997)).

Ultimately, both UK private firms' and public firms' dividend behavior is largely unsupportive of the predictions of dividend signaling theories: firms with less information asymmetry (Wholly Owned and Public firms) pay *higher* dividends than firms with more (Private Dispersed firms); and, for none of these three groups of firms do we observe that dividends convey information about subsequent earnings changes. This is consistent with work using data on US public firms (e.g., Grullon, Michaely, and Swaminathan (2002)) that has struggled to find compelling evidence for this theory of dividends, beyond that found in equity return responses to these changes.

IV. Further Discussion

Agency conflicts and asymmetric information, the focus of our study, are but two candidate forces to explain why corporate dividend policies deviate from that prescribed by Miller and Modigliani's irrelevance theorem. Two other potentially important factors are taxes and transaction costs (or limited access to capital markets). For the purpose of this paper, the relevant issue is not so much whether these alternative factors are relevant for dividend policy,

but, rather, whether they can explain the differential dividend behavior of public and private firms discussed above. Hence, this section investigates the plausibility of taxes and transaction costs as alternative explanations for the observed dividend behavior.

Beginning with taxes, we note that all UK firms, both public and private, are subject to the same tax environment and dividend imputation schemes (see Ball and Shivakumar (2002) and Bell and Jenkinson (2002)). This homogeneity implies that taxation alone cannot explain our findings. However, it is possible that the marginal (and average) investors of private and public firms are subject to different taxes. Thus, in spite of homogenous taxing of public and private firms, 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.

Testing the effect of taxes is complicated here, as in most studies, by the inability to observe the relevant tax rate of the marginal investor. However, in 1997, the incoming Labour government radically reformed the taxation of dividend income in the UK by abolishing the right of pension funds to be repaid the imputation tax credit on dividends. As pension funds own almost a quarter of the outstanding publicly traded equity in the UK (Bell and Jenkinson (2002)), this act represents a significant shift in the after-tax value of dividends to a large player in the public equity markets. We use this policy shift as natural experiment to examine the sensitivity of our results to tax considerations.

Results based on before- and after-1997 subsamples are qualitatively and quantitatively similar to those presented above. For example, we find that the average payout ratio in pre-1997 era for Wholly Owned, Private Dispersed, and Public firms are 0.28, 0.20, and 0.28, respectively. In the post-1997 era, the average payout ratios are 0.24, 0.16, and 0.30, respectively. Additionally, the differences between Public (Wholly Owned) and Private Dispersed are

statistically significant in both eras. We also find identical patterns in the propensity to omit, cut, initiate, and increase dividends across the three groups of firms in both the pre- and post-1997 period. Thus, these findings suggest that the associations among public and private firms' dividend policies are insensitive to a significant exogenous shift in tax policy. Moreover, it is difficult to reconcile a tax-based explanation for why public firms smooth their dividends, yet private firms, and especially Wholly Owned firms, do not.

Turning to transaction costs, private firms face relatively higher transaction costs in accessing external capital because of limited access (e.g., Brav (2005a) and Leary (2005)). This relation suggests that distributing cash is less costly for public firms relative to private firms. Thus, a transaction cost-based story is consistent with Public firms paying higher dividends relative to private firms. However, the transaction cost story cannot explain why public firms smooth dividends and private firms do not. Nor can this alternative explain why dividend increases by both the private dispersed firms and the wholly-owned are significantly higher than public firms (Table 3). Further, when Private Dispersed firms do cut dividends, the relative magnitude is no different than that of Public firms. These findings are somewhat at odds with private firms varying dividends in a manner to hoard cash in an effort to avoid costly external finance. These findings are also difficult to reconcile with the intra-private firm variation that we observe throughout our analysis. In particular, we find that Wholly Owned firms distribute a significantly larger fraction of earnings than Private Dispersed firms and Wholly Owned firms' dividend streams are significantly more volatile than those of Private Dispersed firms. Thus, while transaction costs may be relevant, they, like taxes, are unlikely the driving force behind most of our findings.

V. Conclusion

By now it is almost an article of faith that firms follow Lintner's description of dividend policy: they smooth dividends, they are reluctant to cut dividends, and they increase dividends by small increments. Studies have confirmed this behavior among many firms (e.g., Fama and Babiak, 1968) and spanning many decades (Brav et al. 2005). Yet, we had little understanding for the reasons behind these policies. One of the main contributions of our paper is to show that this type of behavior is related to both the scrutiny of the public capital markets and traditional financial frictions. That is, while information asymmetry and agency conflicts manifest themselves in the form of dividend policies that are smooth relative to a Modigliani and Miller benchmark, these frictions are unable to explain why public firms smooth dividends even more so than private firms that operate in a more informationally opaque environment with fewer governance mechanisms to mitigate agency conflicts. Thus, it is the combination of financing frictions and the scrutiny of public capital markets that leads to the observed pattern of dividend policies.

Our results also highlight the role that public capital markets play in empowering outside shareholders via various governance mechanisms. We find evidence to suggest that Public firms pay significantly higher dividends relative to otherwise similar private firms, whose shareholders have relatively little power or recourse against managerial abuses. We also find that public firms' dividends exhibit a greater sensitivity to investment opportunities relative to those of private firms where informational opacity is greatest and the potential for agency conflicts largest.

On the other hand, 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 higher dividend payout rates

and a greater sensitivity of dividends to earnings and investment opportunities. These finding can be viewed as the benchmark case where the Miller and Modigliani (1961) assumptions of no financing frictions are relatively close to true and; as such, our finding that dividends behave much like a residual decision, as Modigliani and Miller predict, is reassuring.

Finally, we find that the signaling models do no better at describing the dividend policies of UK Private and Public firms than they do at describing the dividend policies of US public firms.

Despite shedding light on several issues, our results also lead to new questions. Private firms comprise a significant fraction of the economy, in terms of their contribution to GDP (not only in the UK but in the US, as well). Thus, how does the aggregate behavior of private firms' dividend policies accord with that of their public counterparts? Or, aggregate consumption? This second question is of particular interest given the vastly different temporal properties of private firms' dividends relative to those of their public counterparts. We leave these questions to future research.

Appendix A: Data Definitions

All definitions coincide with line items in corporate balance sheets and 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: Classifying Ownership Structure

We classify private firms into three groups Wholly Owned, Private Dispersed, and Public. This classification is based on ownership data available on the FAME database. Specifically, FAME presents three sets of ownership information of varying degrees of precision and redundancy but all three sets of information are static. That is, they are only snapshots of the ownership structure at a particular time and, therefore, they offer only a proxy to the ownership structure of the firm over the duration of the sample time horizon. As such, our classification of private firms can only be performed for firms in the matched sample. Unfortunately, these decisions simply reflect the limitations of the data; however, we believe this is a relatively small limitation. In particular, ownership structures for private firms are quite sticky. Shareholders of private firms may choose not to sell their shares for several reasons including familial obligation and long-term investment horizons (private equity funds (Kaplan and Stromberg (2003)). A more important consideration is that it is difficult and expensive to sell shares in a privately held firm. There are no market prices and liquidity is scarce at best.

The first set of ownership data is from Bureau Van Dijk (BVD), which contains information on any holding companies, defined as a shareholder controlling at least 50% of the voting shares in the company. This data also contains information on significant shareholders and, in some cases, their fractional holdings. When a BVD shareholder is registered as owning 100% of the company in question or their holdings are reported as "WO" (i.e., Wholly Owned), then the company is classified as Wholly Owned. For example, Ryalux Carpets is a carpet and rug manufacturer that is a Wholly Owned subsidiary of Sirdar Floor Coverings. Additionally, several of Sirdar's board members are also directors of Ryalux. Similarly, Coleman Properties is

a real estate management company Wholly Owned by Mr. J. G. Coleman, who also serves on the board of directors.

The second set of ownership data is from the annual return filed at Companies House. This set also often contains information on significant shareholders and the number of shares they hold. When a firm does not have information from BVD on the holdings of any shareholders, we utilize the information in the annual returns. Specifically, we define as a Wholly Owned firm any company with either one shareholder or one shareholder that owns over 98% of the total number of shares listed in the return. For example, Zaira Caterers is classified as a Wholly Owned company despite having two shareholders because Mr. Hamid Ali owns 99 ordinary £1 shares and Mrs. Nazneed Ali owns 1 ordinary £1share.

Given the nature of our experiment, we would like to ensure that our private firms have diverse outside ownership. Therefore, firms with less than five shareholders are classified as Wholly Owned firms. This category includes family firms and firms run by institutional investors, such as private equity funds, and other corporations, such as suppliers and distributors. An example of the former type of firm includes Cooper Callas owned by the Cooper family. An example of the latter type of firm includes Poldrait Textiles which is owned in part by private equity groups, Noble Grossart Investments and Mount Holdings. Importantly, in each of these examples, the companies are entirely owned by either family members, in the former examples, or institutional investors, in the latter example. There are no other shareholders.

A firm is classified as Private Dispersed when there is no indication of the firm being Wholly Owned and the name of the shareholder from the annual return reads “NUMEROUS SHAREHOLDER” or “BULK LIST OF SHAREHOLDERS.” Alternatively, when the type of

shareholder – often "Individual" or "Corporation" – is described as "BULK LIST OF SHAREHOLDERS" then the firm is classified as a Private Dispersed firm.

The third set of ownership data is a list of shareholders from the Registry. This information is only available for quoted (i.e., Public) companies. However, in many instances, previous Registry information is still available for firms that are currently private, indicating that at one point the firm was once Public. This information enables us to classify a number of firms that transition from Public to Private but are not recorded in SDC or Zephyr. The date of this information (posted on the registry) also enables us to identify the approximate date of the transition.

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Figure 1
Ownership Classification of Firms

The figure summarizes where three groups of firms, defined by their ownership structure, fall on the spectrum of information asymmetry and agency problems between managers and shareholders. Wholly Owned firms are privately held firms with less than five shareholders. Private Dispersed firms are privately held firms for which the number of shareholders are "too numerous" to list according to BVD and no one investor owns more than 50% of the firm. Public firms are publicly held (i.e., quoted) firms. The defining characteristic of each group is beneath the group name.

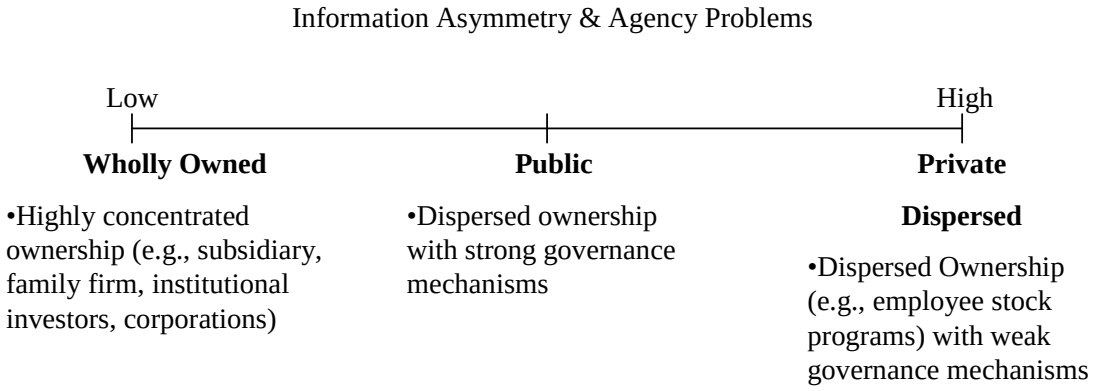

Figure 2
The Dynamic Response of Dividends to Earnings Shocks

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 firms are privately held firms with less than five shareholders. Private Dispersed firms are privately held firms for which the number of shareholders are "too numerous" to list according to BVD and no one investor owns more than 50% of the firm. Public firms are publicly held (i.e., quoted) firms. 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 only increase by 6% relative to their target payout ratio.

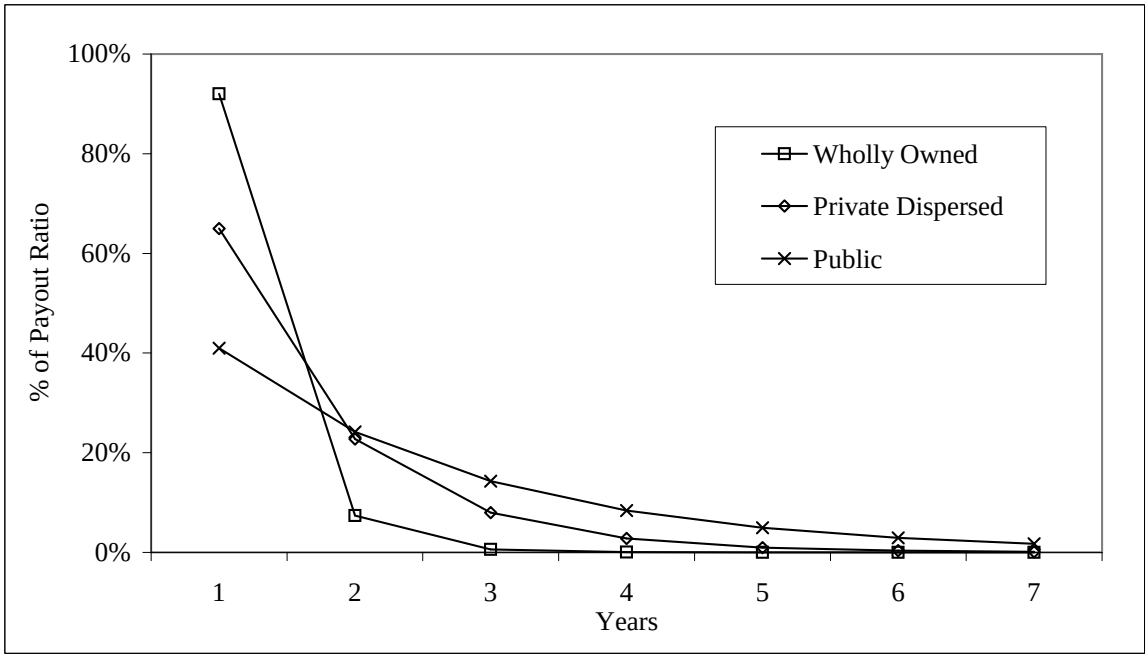

Table 1

Summary Statistics

The samples consists of all nonfinancial, nonagricultural, and nongovernment firms in the FAME database during the period 1993 - 2002 that are subject to the Companies Act auditing requirement. We also examine all nonfinancial, nonagricultural, and nongovernment in the intersection of CRSP and Compustat during 1993 - 2002. All US dollar values are converted to pounds (GBP) using end of calendar year exchange rates. The table presents summary statistics - mean, median (in brackets) and standard deviations (in parentheses) - for firm characteristics of public and private firms. Panel A presents results for the entire sample. Panel B presents the results for the subsample of UK firms that undergo a transition from public to private (or vice versa). All variables are defined in Appendix A.

Panel A: All Firms

	Compustat Firms			FAME Firms					
				Private			Public		
Variable	Obs	Mean	SD	Obs	Mean	SD	Obs	Mean	SD
Size	78,356	1,054.62	5,748.69	315,262	49.42	663.67	10,956	565.59	4,198.37
		[54.73]			[5.16]			[46.99]	
Capital Investment	63,302	0.26	0.90	271,050	0.18	0.73	9,532	0.33	1.17
		[0.04]			[0.01]			[0.06]	
Prof / Assets	76,165	-0.18	0.65	287,294	0.04	0.11	10,682	-0.01	0.21
		[0.01]			[0.04]			[0.04]	
Tangible Assets / Assets	77,220	0.29	0.24	304,134	0.27	0.23	10,644	0.33	0.24
		[0.22]			[0.21]			[0.28]	
$I(DividendPayer)$	172,215	0.11	0.31	335,120	0.34	0.47	11,055	0.71	0.46
		[0.00]			[0.00]			[1.00]	
Div / Prof	43,396	0.19	0.38	236,183	0.31	0.62	7,732	0.47	0.50
		[0.00]			[0.00]			[0.39]	
Debt / Assets	74,794	0.24	0.23	161,443	0.52	0.21	8,039	0.36	0.17
		[0.21]			[0.53]			[0.35]	
Sales Growth	61,843	0.24	0.87	238,196	0.12	0.44	9,259	0.21	0.67
		[0.06]			[0.04]			[0.06]	
Profit Volatility	11,709	0.26	0.46	37,680	0.07	0.06	1,533	0.12	0.14
		[0.09]			[0.05]			[0.07]	

Panel B: Transition Firms

	Private			Public		
Variable	Obs	Mean	SD	Obs	Mean	SD
Size	2,151	214.77	1,006.66	4,720	234.86	1,071.50
		[15.44]			[37.00]	
Capital Investment	1,714	0.38	1.33	4,121	0.49	1.75
		[0.02]			[0.08]	
Prof / Assets	1,992	-0.01	0.25	4,591	-0.04	0.27
		[0.03]			[0.04]	
Tangible Assets / Assets	1,896	0.30	0.26	4,524	0.31	0.25
		[0.23]			[0.27]	
$I(DividendPayer)$	2,229	0.45	0.50	4,778	0.62	0.48
		[0.00]			[1.00]	
Div / Prof	1,351	0.45	0.94	3,093	0.43	0.46
		[0.16]			[0.36]	
Debt / Assets	1,175	0.44	0.22	3,294	0.35	0.19
		[0.43]			[0.35]	
Sales Growth	1,268	0.44	2.29	3,916	0.36	1.18
		[0.08]			[0.10]	
Profit Volatility	500	0.12	0.16	835	0.15	0.18
		[0.06]			[0.07]	

Table 2
Propensity Score Matching

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 1 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. Wholly Owned firms are privately held firms with less than five shareholders. Private Dispersed firms are privately held firms for which the number of shareholders are "too numerous" to list according to BVD and no one investor owns more than 50% of the firm. Public firms are publicly held (i.e., quoted) firms. All variable are defined in Appendix A.

Panel A: Probit Regressions (Public to Private Dispersed)

Variable	Pre-Match	Post-Match
Intercept	-3.88	-1.77
	(0.33)	(0.31)
Size	0.43	0.24
	(0.03)	(0.03)
Sales Growth	0.02	0.00
	(0.04)	(0.05)
Oper Prof / Assets	-0.35	0.05
	(0.20)	(0.21)
Debt / Assets	-1.28	-0.59
	(0.19)	(0.22)
Control (Private Dispersed)	3,754	1,425
Treatment (Public)	4,121	4,101
Obs	7,875	5,526
Pseudo R^2	0.58	0.09

Panel B: Probit Regressions (Public to Private Concentrated/Wholly Owned)

Variable	Pre-Match	Post-Match
Intercept	-4.33	-0.41
	(0.12)	(0.18)
Size	0.35	0.05
	(0.01)	(0.02)
Sales Growth	0.15	0.04
	(0.02)	(0.04)
Oper Prof / Assets	-1.32	-0.01
	(0.16)	(0.18)
Debt / Assets	-2.23	-0.14
	(0.09)	(0.15)
Control (Wholly Owned)	123,041	3,473
Treatment (Public)	4,101	4,101
Obs	127,142	7,574
Pseudo R^2	0.42	0.00

Table 3
Dividend Changes for Private and Public Firms

Panel A presents summary statistics for three matched samples of firms. Wholly Owned firms are privately held firms with less than five shareholders. Private Dispersed firms are privately held firms for which the number of shareholders are "too numerous" to list according to BVD and no one investor owns more than 50% of the firm. Public firms are publicly held (i.e., quoted) firms. 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 experienced a decrease (increase) in dividends over the year.

Panel A: Matched Sample

		Sample				
		Wholly	Private	Public	t-Statistics	
Variable	Statistic	Owned (a)	Dispersed (b)	(c)	(a)-(c)	(b)-(c)
Pr(Omit)	Mean	0.090	0.048	0.037		
	SE	0.005	0.006	0.003	9.583	1.971
	Obs	3,473	1,425	4,101		
Pr(Cuts)	Mean	0.210	0.197	0.164		
	SE	0.007	0.012	0.007	4.755	2.452
	Obs	3,473	1,425	4,101		
Decrease / Dividends	Mean	-0.672	-0.508	-0.512		
	SE	0.013	0.024	0.016	-7.703	0.155
	Obs	731	281	671		
Pr(Initiation)	Mean	0.088	0.057	0.030		
	SE	0.005	0.006	0.003	10.514	3.874
	Obs	3,473	1,425	4,101		
Pr(Increase)	Mean	0.287	0.434	0.640		
	SE	0.009	0.018	0.013	-23.134	-9.385
	Obs	3,473	1,425	4,101		
Increase / Dividends	Mean	1.552	1.019	0.288		
	SE	0.139	0.164	0.012	9.045	4.440
	Obs	687	533	2,478		

Panel B: Transition Firms

		Sample		t-statistic
Variable	Statistic	Private (a)	Public (b)	(a)-(b)
Pr(Omit)	Mean	0.117	0.052	
	SE	0.006	0.003	9.088
	Obs	2,087	4,563	
Pr(Cuts)	Mean	0.368	0.223	
	SE	0.010	0.007	11.853
	Obs	2,087	4,563	
Decrease / Dividends	Mean	-0.745	-0.611	
	SE	0.015	0.016	-6.063
	Obs	478	741	
Pr(Initiation)	Mean	0.076	0.047	
	SE	0.005	0.003	4.631
	Obs	2,087	4,563	
Pr(Increase)	Mean	0.258	0.449	
	SE	0.012	0.013	-11.001
	Obs	2,087	4,563	
Increase / Dividends	Mean	3.311	0.549	
	SE	0.442	0.032	6.232
	Obs	377	1,818	

Table 4
Lintner Model of Dividends

The estimation sample consists of all firm-year observations for firms in each of the three matched samples. Wholly Owned firms are privately held firms with less than five shareholders. Private Dispersed firms are privately held firms for which the number of shareholders are "too numerous" to list according to BVD and no one investor owns more than 50% of the firm. Public firms are publicly held (i.e., quoted) firms. The table presents summary statistics for the distribution of parameter estimates from Linter's model of dividends. Specifically, we model dividends as:

$$\Delta Dividend_t = \alpha + \lambda(\beta Profit_t^* - Dividend_{t-1}) + \varepsilon_t,$$

and estimate the model for each company producing 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 variable are defined in Appendix A.

Parameter	Firms	Mean	SE(Mean)	Min	25%	Median	75%	Max
Wholly Owned Firms								
Intercept	1,501	2.27	0.33	-9.37	-0.00	0.08	1.55	51.73
SOA	1,472	0.92	0.01	0.00	0.67	0.98	1.19	1.80
TP	1,473	0.32	0.27	-1.11	0.00	0.15	0.57	2.53
Private Dispersed Firms								
Intercept	284	0.07	0.01	-0.35	0.00	0.02	0.07	1.56
SOA	280	0.65	0.02	-0.20	0.29	0.64	1.00	1.53
TP	281	0.14	0.02	-0.26	0.01	0.07	0.23	1.14
Public Firms								
Intercept	460	2.30	0.94	-1.66	0.03	0.18	1.07	54.97
SOA	458	0.41	0.02	-0.26	0.11	0.33	0.67	1.40
TP	458	0.20	0.07	-0.99	0.01	0.14	0.36	2.67

Table 5

Dividend Levels for Private and Public Firms

Panel A presents summary statistics and hypothesis test results for the three matched samples. Wholly Owned firms are privately held firms with less than five shareholders. Private Dispersed firms are privately held firms for which the number of shareholders are "too numerous" to list according to BVD and no one investor owns more than 50% of the firm. Public firms are publicly held (i.e., quoted) firms. 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. Panel C presents regression results from a firm fixed-effect regression of dividends dividend by operating profits. All variable are defined in Appendix A. All standard errors are robust to heteroscedasticity and within firm correlation.

Panel A: Matched Sample

		Sample					
		Wholly	Private	Public	t-Statistics		
Variable	Statistic	Owned (a)	Dispersed (b)	(c)	(a)-(b)	(a)-(c)	(b)-(c)
Dividends / Operating Profit	Mean	0.252	0.169	0.289			
	SE	0.009	0.008	0.006	6.720	-3.444	-11.810
	Obs	2,668	1,067	3,304			

Panel B: Transition Firms

Variable	Statistic	Sample		t-statistic
		Private (a)	Public (b)	(a)-(b)
Dividends / Operating Profit	Mean	0.124	0.214	
	SE	0.007	0.005	-10.663
	Obs	1,112	2,746	

Panel C: Transition Firms - Firm Fixed Effect Regression

Intercept	-0.327
	(-2.495)
$I(Public)$	0.034
	(2.504)
Sales Growth(t+1)	0.036
	(2.602)
Size	0.042
	(4.180)
Debt / Assets	-0.102
	(-3.624)
Oper Prof / Assets	0.106
	(2.263)
Firm Fixed Effects	Yes
$Adj.R^2$	0.543
RMSE	0.109
Obs	2,171

Table 6
Dividend Level Regressions

The sample consists of all nonfinancial firms in the FAME database during the period 1993 - 2002 that underwent a transition from private to public (or vice versa). The table presents estimates from a regression of dividends in year t, normalized by year-end operating profits in t, on several variables. Panels A presents the results from estimating the regression on each of the three matched samples. Wholly Owned firms are privately held firms with less than five shareholders. Private Dispersed firms are privately held firms for which the number of shareholders are "too numerous" to list according to BVD and no one investor owns more than 50% of the firm. Public firms are publicly held (i.e., quoted) firms. Panels C presents the results from estimating three regression on the subsample of firms that underwent a transition from public to private (or vice versa) status. Variable definitions are provided in the Appendix. Also included in the regressions but not presented are year indicator variables. Standard errors are robust to both heteroscedasticity and within firm correlation.

Panel A: Matched Sample

Parameter	Wholly Owned	Private Dispersed	Public
Intercept	-0.276	-0.048	-0.217
	(-2.656)	(-0.547)	(-5.046)
Sales Growth(t+1)	-0.113	0.063	-0.080
	(-2.338)	(1.487)	(-3.773)
Size	0.039	0.003	0.028
	(7.029)	(0.389)	(10.063)
Debt / Assets	-0.216	-0.256	-0.189
	(-3.720)	(-5.693)	(-4.980)
Oper Prof / Assets	0.674	-0.217	-0.090
	(4.642)	(-1.454)	(-1.158)
R^2	0.063	0.085	0.119
RMSE	0.406	0.174	0.174
Obs	1,899	770	2,449

Panel B: Transition Firms

Parameter	Private	Public
Intercept	0.087	-0.111
	(0.880)	(-2.578)
Sales Growth(t+1)	0.014	-0.030
	(0.480)	(-2.628)
Size	0.016	0.025
	(2.263)	(7.864)
Debt / Assets	-0.053	-0.073
	(-1.336)	(-3.072)
Oper Prof / Assets	0.258	0.239
	(2.584)	(6.180)
R^2	0.070	0.190
RMSE	0.187	0.132
Obs	508	1,663

Table 7
Raw Earnings Change Regression

The sample is a matched sample consisting of nonfinancial firms in the FAME database during the period 1993 - 2002 that did not undergo a transition from private to public (or vice versa). The table presents regression estimates of the change in earnings from year $t-1$ to year t, normalized by book equity in $t-1$, on several determinants for each of the three matched samples. Wholly Owned firms are privately held firms with less than five shareholders. Private Dispersed firms are privately held firms for which the number of shareholders are "too numerous" to list according to BVD and no one investor owns more than 50% of the firm. Public firms are publicly held (i.e., quoted) firms. *DPC* (*DNC*) is a binary variable equal to one if the firm increased (decreased) its dividend. *Div* is the level of dividends. *Earn* is the level of profits after taxes and interest. *ROE* is the return on equity defined as the ratio of profits after taxes and interest to book equity. *E(ROE)* is the expected return on equity defined as the predicted value from a regression of ROE on lagged values of the natural logarithm of market-to-book, the natural logarithm of assets deflated by the GDP deflator, and ROE. *Book Equity* is the book value of equity. The $[x]^+$ ($[x]^-$) notation denotes the max (min) of zero and x. Also included in both specifications but not reported are calendar year indicator variables. t-statistics in parentheses are computed using standard errors adjusted for within firm dependence.

Panel A: Linear Partial Adjustment

	Period t Earnings Change			Period $t+1$ Earnings Change		
Parameter	Wholly Owned	Private Dispersed	Public	Wholly Owned	Private Dispersed	Public
Intercept	0.0843	0.0651	0.0420	0.0522	0.0721	0.0356
	(2.4497)	(0.9729)	(2.9575)	(1.3554)	(0.8985)	(1.7287)
$DPC_{t-1} \times \Delta Div_t/Div_{t-1}$	0.0011	0.0047	0.0244	0.0011	-0.0063	-0.0033
	(0.7192)	(0.7503)	(2.6029)	(0.5474)	(-1.0585)	(-0.3201)
$DNC_{t-1} \times \Delta Div_t/Div_{t-1}$	0.0029	0.0362	0.0810	0.0007	-0.0587	-0.0593
	(0.3247)	(1.5592)	(2.7993)	(0.0617)	(-1.8525)	(-1.5930)
ROE_{t-1}	-0.2065	-0.4839	-0.5091	-0.0120	-0.0970	-0.1039
	(-5.7464)	(-6.2447)	(-8.2851)	(-0.3850)	(-1.5017)	(-1.8600)
$\Delta Earn_{t-1}/BookEquity_{t-2}$	-0.1146	-0.0938	-0.0858	-0.0611	0.0184	0.0676
	(-4.0558)	(-1.7498)	(-1.7216)	(-2.1347)	(0.2025)	(1.7107)
R^2	0.07	0.22	0.17	0.01	0.02	0.01
Obs	7,604	2,179	3,428	6,564	1,861	2,927

Panel B: Nonlinear Partial Adjustment

	Period t Earnings Change			Period $t+1$ Earnings Change		
Parameter	Wholly Owned	Private Dispersed	Public	Wholly Owned	Private Dispersed	Public
Intercept	0.0151	0.0547	-0.0177	0.0583	0.0369	0.0410
	(0.4662)	(0.8319)	(-1.0245)	(1.5550)	(0.5357)	(1.9941)
$DPC_{t-1} \times \Delta Div_t/Div_{t-1}$	-0.0012	0.0018	0.0108	-0.0016	-0.0057	0.0004
	(-0.7046)	(0.2344)	(1.1691)	(-0.8981)	(-0.8320)	(0.0396)
$DNC_{t-1} \times \Delta Div_t/Div_{t-1}$	0.0173	0.0332	0.0989	0.0064	-0.0450	-0.0431
	(1.9457)	(1.3515)	(3.4189)	(0.5438)	(-1.2152)	(-1.0466)
$ROE_{t-1} - E(ROE_{t-1})$	0.2780	-0.2553	-0.1091	0.0395	-0.2674	-0.1867
	(2.4333)	(-1.0983)	(-0.6695)	(0.3850)	(-1.0329)	(-1.0887)
$[ROE_{t-1} - E(ROE_{t-1})]^-$	-1.0006	-0.8764	-0.8713	-0.0497	-0.2281	-0.0932
	(-5.6068)	(-2.9022)	(-4.0886)	(-0.2346)	(-0.5449)	(-0.3559)
$([ROE_{t-1} - E(ROE_{t-1})]^-)^2$	0.0996	-0.1844	-0.0960	0.0740	-0.1466	-0.0487
	(1.2329)	(-1.1799)	(-1.2276)	(0.6373)	(-1.2312)	(-1.0487)
$([ROE_{t-1} - E(ROE_{t-1})]^+)^2$	-0.3672	0.3285	0.2473	-0.0547	0.2366	-0.0615
	(-3.1483)	(0.5870)	(0.6270)	(-0.5009)	(0.4303)	(-0.2307)
$\Delta Earn_{t-1}/BookEquity_{t-2}$	-0.1486	-0.2598	-0.1111	-0.0400	0.2294	0.1594
	(-1.8522)	(-1.4061)	(-1.0996)	(-0.5709)	(0.9747)	(1.1616)
$[\Delta Earn_{t-1}/BookEquity_{t-2}]^-$	0.1572	0.8392	0.1509	-0.1333	-0.0501	0.1097
	(1.1503)	(2.4997)	(0.5773)	(-0.7894)	(-0.1317)	(0.3664)
$([\Delta Earn_{t-1}/BookEquity_{t-2}]^-)^2$	-0.1429	0.4064	-0.0796	-0.0539	-0.0528	0.0611
	(-1.6800)	(2.6686)	(-0.3182)	(-0.5474)	(-0.4964)	(0.2113)
$([\Delta Earn_{t-1}/BookEquity_{t-2}]^+)^2$	0.0290	0.0931	-0.0018	0.0154	-0.2391	-0.0153
	(0.6860)	(0.8211)	(-0.0339)	(0.4537)	(-1.4989)	(-0.3022)
R^2	0.16	0.29	0.23	0.01	0.03	0.01
Obs	6,265	1,807	2,926	5,307	1,510	2,449