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Access to Capital, Capital Structure, and the Funding of the Firm

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ABSTRACT

Based upon a large data set of public and private firms in the United Kingdom, I find that compared to their public counterparts, private firms rely almost exclusively on debt financing, have higher leverage ratios, and tend to avoid external capital markets, leading to a greater sensitivity of their capital structures to fluctuations in performance. I argue that these differences are due to private equity being more costly than public equity. I further examine the private firms subsample to show that private equity is more costly than its public counterpart due to information asymmetry and the desire to maintain control.

THEORIES OF CORPORATE CAPITAL STRUCTURE offer a number of predictions concerning the composition and characteristics of the securities that firms issue. To date, empirical studies examining these predictions focus almost exclusively on their validity in the context of publicly traded firms, in large part due to data availability. As a result, relatively little is known about the financing behavior of privately held firms. Indeed, a number of fundamental questions concerning private firms remain unanswered: What characterizes the capital structures and funding behavior of private firms? Do existing theories of capital structure provide an appropriate description of the financing behavior of private firms? Do the capital structures and corresponding financial policies of private firms differ from those of their public counterparts in a manner consistent with the predictions of the existing theories of capital structure? What is fundamentally different between public and private firms? Do these differences translate into differences in real investment decisions? The goal of this paper is to answer these questions by analyzing the financing behavior of privately and publicly held firms in the United Kingdom during the period 1993 to 2003, using the Financial Analysis Made Easy (FAME) database.

Though rarely studied, private companies represent a significant portion of the United Kingdom's production base as illustrated in Figure 1, which shows

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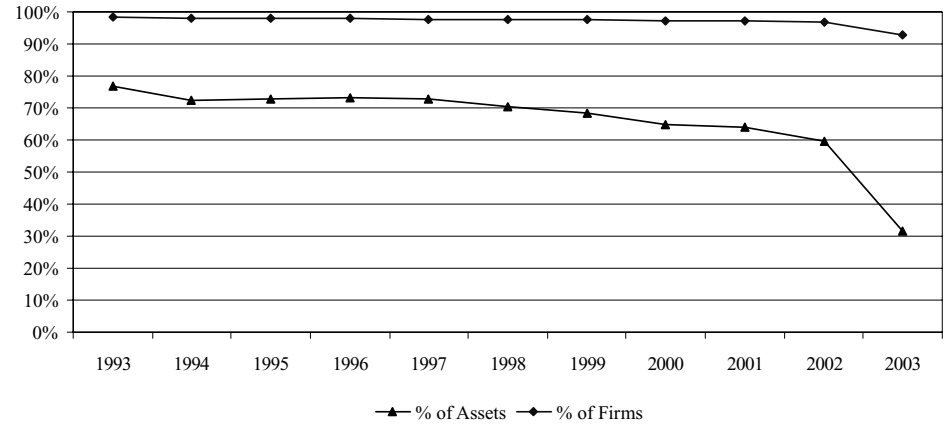

Figure 1. Percentage of privately held firms and assets. The percentage of privately held assets is the sum of all private firms' total assets divided by the sum of private and public firms' total assets for each calendar year. Note that the share of private firms (in both measures) is biased downward in 2003 and upward in 1993. This is because public firms are required to provide their accounts at the Companies House in a timelier manner. Because the DVD version of the FAME database used in this paper is from November 2003, public firms are overrepresented in the 2003 calendar year. In addition, because Bureau van Dijk keeps no more than 10 accounting statements for each firm, public firms are underrepresented in the 1993 calendar year. Note further that the data for this figure include all firms in my final sample (see Section II.C). Therefore, on the one hand, because it ignores potential cross-ownerships, it biases upward the percentage of private firms since part of the private firms are subsidiaries of public firms. On the other hand, because the sample excludes small firms, which are probably all private, it biases downward the percentage of private firms.

that more than two-thirds of corporate assets are owned by private firms. Equally important, private companies outnumber public companies, representing 97.5% of all incorporated entities in the United Kingdom.

The differences between the financial policies of private and public firms are striking. Private firms have leverage ratios that are approximately 50% higher (33.7% vs. 22.7%), on average, than their public counterparts. A closer look at private versus public firms' capital structures reveals further differences in the maturity structure of debt. The ratio of short-term debt to total debt is 64% for private firms, while the same ratio for public firms is about half as large at 37%. While equity issues comprise approximately 40% of the incidents in which public firms raise external capital, for private firms this figure is approximately 10%. These large cross-sectional differences, as well as the fact that these two groups of firms differ markedly in their ability to access the public equity markets, provide an ideal setup to examine rational theories of capital structure.

Theories of capital structure, such as the trade-off theory and pecking order hypothesis, offer several predictions with respect to the relative differences in the financial policies and capital structures between public and private firms. I classify these predictions into two groups: the level effect and the sensitivity

effect. The *level* effect refers to consequences that arise from the fact that private firms' *relative cost* of equity to debt capital is higher than that of public firms. The immediate consequence of the level effect is that the likelihood with which private firms choose debt versus equity financing is higher than that of public firms, and in turn the *level* of private firms' debt ratios is higher than the *level* of their public counterparts' debt ratios. The *sensitivity* effect refers to consequences that arise from the fact that private firms' *absolute cost* of accessing the external capital markets is higher than that of public firms. The immediate consequence of the sensitivity effect is that private firms' financial policies are more passive than those of public firms, that is, private firms are less likely to visit the external capital markets. Since it is more costly for private firms to rebalance their debt ratios, their leverage will exhibit larger *sensitivity* to operating performance, smaller *sensitivity* to traditional trade-off theory determinants of capital structure, and greater persistence.

I begin the empirical analysis of the paper by testing each of the hypothesized consequences of the level and sensitivity effects. Consistent with the level effect I find that when facing the debt–equity choice public firms are significantly more likely than private firms to choose equity relative to debt. Examining the determinants of firms' debt ratios I find that public firms have statistically and economically lower leverage ratios. These results are complementary to those in Faulkender and Petersen (2006), who show that among public equity firms, firms without access to the public debt markets are more restricted in their ability to borrow and therefore have lower leverage. Consistent with the sensitivity effect I find that public firms are more likely than private firms to visit the external capital markets, either to raise or to retire capital. Further, in an analysis of the determinants of debt ratios, I find that the leverage of private firms is more sensitive to operating performance but less sensitive to traditional trade-off theory determinants of capital structure such as proxies for growth opportunities. In addition, when I examine a target adjustment model as in Shyam-Sunder and Myers (1999), I find that private firms' debt ratios exhibit higher persistence and are slower to adjust to their mean.

The Modigliani and Miller (M&M, 1958) theorem shows that in a frictionless market capital structure is irrelevant. The large differences I document between public and private firms' capital structures and financial policies therefore raise the question of what exactly are the market frictions that violate the M&M theorem and lead private equity to be more costly than public equity. Since U.K. tax laws do not discriminate between public and private firms, one must search for deviations from Modigliani and Miller (1958) assumptions within the agency and asymmetric information domains.

One fundamental difference between private and public firms is their ownership structure and hence the degree to which control is valued by their shareholders. Where conflicts of interest exist, agency problems can arise and control is valuable. Therefore, firms controlled by a major shareholder should be reluctant to use equity financing when doing so causes the controlling shareholder to risk losing control (Amihud, Lev, and Travlos (1990), Stulz (1988)). Since private firms are held by at most a few shareholders, each of whom enjoys

significant control over the firm, whereas a public firm is held by many atomistic shareholders without any control over the firm, the cost of issuing equity (giving away control) is higher for private firms than for public firms. Indeed, maintaining control is probably one of the main reasons private firms are private to begin with.[1] In addition, given the separation between management and ownership that is more typical of a public firm than a private firm, managers of public firms may rationally seek to dilute the control of any single shareholder, further increasing the value of equity to managers of public firms relative to managers of private firms (Morellec (2004)). Finally, given private firms do not tend to offer minority shareholders the same disclosure and protections they would enjoy with public firms, minority shareholders may be less willing to purchase private equity, contributing further to equity issuance being more expensive for private firms than public firms. In sum, a security that gives away control—equity—should be much more costly to issue for the manager of a private firm than for the manager of a public firm.

Another important distinction between private and public firms is the level of information asymmetry between insiders and outsiders (i.e., transparency) at the time capital is raised. Since private firms are obviously more opaque to outsiders, and since the value of equity, being the more junior security in the capital structure, is more sensitive to information asymmetry than the value of debt (e.g., Myers and Majluf (1984), Noe (1988)), the cost of equity relative to debt will be much higher for private firms than for public firms and thus equity will again be less attractive than debt for private firms.

To test whether, indeed, the desire for control and information asymmetry are the market frictions that lead private equity to be more costly than its public counterpart, I reexamine the debt–equity choice and the determinants of debt ratios on the subsample of private firms at the most recent reporting date. This subsample contains good proxies for both ownership concentration (value of control) and information asymmetry (transparency). Using this subsample, I show that firms with more dispersed ownership, as proxied by the number of shareholders in the firm, and firms that are more transparent, as proxied by whether they are legally allowed to issue securities to the public, are more likely to rely on equity financing and have lower debt ratios.

Given private firms are subject to higher financing costs, which in turn affect their financial policies, it is natural to ask how private firms' relatively more constrained financial policies affect other aspects of the funding of the firm. Examining firm-level cash holdings, I find that consistent with the fact that private firms access the capital markets less frequently, they stockpile cash in good times and dilute their cash holdings in bad times. Perhaps more importantly, investigation of firms' capital expenditures reveals that while public firms increase their investments as soon as their profitability increases, private firms do so with a lag. If profitability also measures the availability of positive-NPV projects, this result suggests that access to

[1] For an empirical analysis of the decision to go private and public, see Pagano et al. (1998) and Brav, Brav, and Jiang (2005).

public capital markets allows a firm to better exploit the available investment opportunities.

This paper contributes to the academic literature on corporate finance in three primary ways. First, it is the first paper to document systematic differences between the financial policies of public and private firms. I argue that the observed differences are consistent with the implications of public equity capital being cheaper than its private counterpart. Second, the paper shows that information asymmetry and ownership concentration are two important frictions that lead public equity to be cheaper than private equity. Finally, this paper shows that ultimately access to the public equity market has a major impact on other aspects of firm behavior, including decisions with respect to cash holdings, capital expenditures, and dividend policy.

The rest of the paper proceeds as follows. In Section I, I assume that private equity is more costly than public equity. Relying on this assumption, I present the hypotheses that capital structure theories predict with respect to the expected differences between the financial policies of public and private firms. Section II provides an overview of the differences between private and public firms in the United Kingdom, describes the data sources, and defines the sample. In Section III, I test the hypotheses presented in Section I, and in Section IV, I revisit the assumption made in Section I. Section V examines how private firms' more limited access to external finance affects other aspects of the funding of the firm, including cash management, dividend policy, and perhaps most importantly, investment decisions. Section VI summarizes the findings and concludes the paper.

I. Cost of Capital and Financial Policy

It is well accepted that one important reason private firms go public is to obtain better and cheaper access to external equity capital. In this section, I present the implications of this idea for capital structure and financial policy. I classify the implications into two groups: the level effect and the sensitivity effect. The level effect refers to predictions that arise from differences between private and public firms' relative cost of equity to debt capital, which result in differences between public and private firms' level of leverage and likelihood of choosing debt versus equity financing. The sensitivity effect refers to predictions that arise from differences between private and public firms' absolute cost of accessing the external capital market, which result in differences between public and private firms' likelihood of visiting the external capital markets, as well as between the sensitivity of their financial policies to various shocks. In what follows, all predictions concerning differences between public and private firms implicitly assume that all other differences are held constant.

A. Level Effect

If private equity is more costly than public equity then the relative cost of equity to debt capital is higher for private than for public firms.[2] This condition

[2] This statement also relies on the assumption that the main dimension along which public and private firms differ is their access to public equity (not public debt). Since I do not have data on the

implies that there will be a level effect whereby private firms will rely more on debt financing relative to public firms. Therefore, the first empirically testable implication is

L1: Private firms have higher debt ratios than public firms.

The pecking order theory (Myers and Majluf (1984)) predicts that the more asymmetric the information between insiders and outsiders is, the less firms will rely on the information-sensitive instrument, equity, and the more firms will rely on the information-insensitive instrument, debt. If private equity is more costly because private firms are more opaque, then the second empirically testable implication is

L2: Conditional on visiting the external capital market and facing the debt–equity choice, private firms are less likely to use equity than public firms.

B. Sensitivity Effect

If private equity is more costly than public equity, then ultimately the absolute cost of accessing the external capital markets should be higher for private firms than for public firms. Due to the level effect, the higher cost of private equity makes private firms rely more heavily on debt. However, as the firm increases its leverage the likelihood and expected costs of bankruptcy increase. The trade-off theory predicts that the firm will continue to increase its leverage until the marginal cost of its equity is equal to the marginal cost of its debt. Therefore, at the optimal debt ratio, the decision to raise capital, debt or equity, in the external capital markets becomes more costly for private firms and hence they have a stronger preference for internal financing. In addition, if private firms' debt ratios are higher, their debt is more risky and more information-sensitive as well. The pecking order theory therefore predicts that private firms' preference for internal capital over external capital will be stronger compared to that of public firms.[3]

type of debt firms have, I cannot match my public and private sample firms with respect to their access to the public debt market. However, in the U.S. market, Faulkender and Petersen (2006) report that among public companies (firms with publicly traded equity), public debt is uncommon, with only 19% of the firms accessing the public debt markets in a given year. Across their sample period, this average ranges from a low of 17% (in 1995) to a high of 22% (in 2000). Given these figures for the U.S. market, it is unlikely that all, or even most, of the public equity firms in the U.K. also have public debt. In addition, given that debt is the more senior security in the capital structure, and therefore is less information-sensitive, the impact of access to public debt on the cost of debt capital is likely to be smaller than the impact of access to public equity on the cost of equity capital.

[3] In addition, it is very likely that the fraction of firms that have public debt is larger within the subsample of public firms than within the subsample of private firms, making the gap between private and public firms' absolute cost of visiting the external capital markets even larger. The vast majority of the private firms in my sample (93%) are private limited companies (limited); only 7% are public limited liability companies (plc). According to U.K. corporate law, limited companies are restricted to offer shares *or debentures* to the public (see Section II.A for the legal definition of public and private companies, versus the definition of private and public companies in this paper). Therefore, only a very small fraction of the private firms in my sample have even the potential to issue public debt.

Since private firms face higher absolute costs than public firms when accessing the external capital markets, they will access the capital markets less often, have smaller scale at any age, and stockpile more cash (so they can go to the markets less often). The consequence of this behavior for capital structure is that private firms will exhibit a sensitivity effect whereby their leverage will be more sensitive to their profitability and less sensitive to other variables that traditional trade-off theory predicts to be determinants of a firm's capital structure (e.g., capital expenditures, growth in sales, asset tangibility).

Based upon the above discussion, the next two hypotheses are

S1: Compared to public firms, private firms' financial policies are more passive, that is, private firms are less likely to raise or retire capital.

S2: Compared to public firms, private firms' leverage is more sensitive to operational performance (leverage is more negatively related to profitability) and less sensitive to other variables that the traditional trade-off theory predicts to be determinants of a firm's capital structure (e.g., capital expenditures, growth in sales, asset tangibility).

The fact that private firms rebalance their debt ratio less actively implies also that

S3: The leverage of private firms exhibits greater persistence and lower adjustment speed.

Finally, since information asymmetry and adverse selection costs are larger for private firms, their decisions are more in line with the pecking order hypothesis and less in line with the target adjustment hypothesis of the traditional trade-off theory. More formally, the next hypothesis is

S4: Compared to public firms, private firms' financial policy is less in line with the target adjustment hypothesis. That is, the debt–equity choice of private firms exhibits a weaker tendency to move leverage toward its target.

II. Data

A. Private and Public Companies in the United Kingdom[4]

In the United Kingdom, all limited liability companies are formed by incorporation with the Companies House[5] and are registered as either public or private companies.[6] The most important distinction between private and public companies relates to their ability to raise funds from the general public. A public company has an unrestricted right to offer shares or debentures to the public,

[4] The overview of the U.K. corporate law in this section is mainly based on Ball and Shivakumar (2005). For references to the applicable sections in the U.K. Companies Act, please refer to that paper.

[5] Companies House is an executive agency of the U.K. Department of Trade and Industry. The main functions of Companies House are to incorporate and dissolve limited companies, examine and store company information delivered under the Companies Act and related legislation, and make this information available to the public. For more information about Companies House, see http://www.companieshouse.gov.uk/about/functionsHistory.shtml.

[6] For further details about the definition and requirements of public firms in the U.K., see http://www.companieshouse.gov.uk/about/gbhtml/gbf1.shtml#two.

whereas such offerings are prohibited for a private company. Since only public companies can issue shares to the general public, only public companies are eligible to be listed (i.e., quoted) on a stock exchange. In this paper, I define as public only those companies that are listed and as private any company that is not listed. Note that my definition of private firms does not distinguish between public unlisted and private unlisted companies, in part because I focus on access to the public equity capital markets. However, in Section IV, where I focus on the subsample of private firms, I do distinguish between private unquoted and public unquoted firms. To avoid any confusion, in Section IV, I refer to these two classes of firms as "private not quoted" and "public not quoted," respectively.

The Companies Act of 1967 required that all companies, private and public, file their financial statements annually with the Registrar of Companies House. The 1981 Companies Act modified this provision, allowing medium companies to submit an abbreviated financial statement and small companies to submit only an abbreviated balance sheet without a profit and loss statement.[7] Presently, the financial statements of private (public) companies must be filed within 10 (7) months of their fiscal year-end. All financial statements must be prepared in accordance with U.K. accounting standards, whether the firm is public or private. Their statements must be audited if annual sales exceed 1,000,000 pounds. Before June 2000, the threshold was 350,000 pounds.

U.K. tax laws do not discriminate between public and private firms. The London Stock Exchange listing rules require additional disclosure for public companies, but the rules do not mandate accounting standards for financial reporting and in particular do not address the calculation of earnings. In all important respects, the U.K. regulatory regimes governing financial reporting for public companies and all but the smallest private companies are equivalent.[8]

B. Sources

The data for this paper come from several sources. Balance sheet, income statement, cash flow statement, and ownership information[9] come from the Financial Analysis Made Easy (FAME) database. Information on IPOs for firms going public, and on public takeovers for firms going private, comes from the

[7] Under the Act, to be classified "small" ("medium") a company must fulfill two of the following criteria for 2 consecutive years: (i) annual turnover may not exceed 2.8 (11.2) million pounds, (ii) book value of total assets may not exceed 1.4 (5.6) million pounds, and (iii) number of employees may not exceed 50 (250).

[8] Although private and public companies in the U.K. face substantially equivalent regulations with respect to auditing, accounting standards, and taxes, Ball and Shivakumar (2005) show that private company financial reporting nevertheless is lower in quality due to different market demand, regulations notwithstanding. Their main result is that timely loss recognition is substantially less prevalent in private companies than in public ones. However, it is unlikely that these differences have a systematic effect on the results I present in this paper.

[9] Please refer to Section IV for more detailed information about FAME's ownership module.

SDC Platinum database and is complemented using the Zephyr Database for the period 1997 to 2003. I obtain data used to calculate industry market-to-book valuations from the Worldscope database. The consumer price index comes from the World Development Indicators (WDI), a World Bank Group database. Finally, since among the going-public firms approximately 40% appear in FAME immediately after the IPO (because such firms were incorporated as a holding group just before the IPO), I hand collect information for these firms before the IPO event from their IPO prospectus.

Since the use of the FAME database is relatively novel, I provide further information about it before proceeding. The FAME database is compiled by Bureau van Dijk (BvD), one of Europe's leading electronic publishers of business information.[10] As described above, under current legislation in the United Kingdom, companies must file their accounting statements at Companies House within a specified period of time from the year-end date. When the statements are filed at Companies House, they are processed and checked, and subsequently made available to the public. Jordans, a leading provider of legal information in the United Kingdom, collects data from Companies House daily and transfers it to its own database. BvD collects these data from Jordans to compile the FAME database. This paper uses the November 2003, release 173.0, version of the FAME database.[11]

While FAME includes data for active and dead firms, it records no more than 10 years of data for each firm. Thus, while companies whose last year of reported data are before 2002 (mainly firms that ceased to exist) may have accounting data that go back beyond 1993, the accounting data of active companies date back at most to 1993. To avoid any selection bias, in my analysis I use only years for which FAME includes all the firms that were registered at the time. Thus, my analysis covers the 1993 to 2003 period.

There are two main categories of variables in FAME, namely, static and annual. When a variable is annual (primarily accounting data), the values of the variable are reported for each accounting year-end date. When a variable is static (a "header" variable), only the last year's reported value exists in the database. Unfortunately, some of the interesting variables, such as ownership information and company type (private, public unquoted, public quoted, etc.), are classified as static even though in reality they may occasionally change. I therefore extract the history of the firm related to its listing status from other sources.

I use two sources to identify the listing status of the firm. The first is SDC Platinum, a Thomson Financial database. SDC contains information on multiple deal types including IPOs, SEOs, and going-private transactions. Data for the United Kingdom are available in SDC for the whole sample period. Since SDC does not cover all IPO and going-private deals, I complement it with data from Zephyr. Like FAME, Zephyr is provided by BvD and, like SDC, it contains

[10] For more information about BvD, see http://www.bvdep.com/.

[11] I would like to thank Mitch Gouss from the New York branch of BvD for providing me the FAME DVD-ROM.

information on multiple deal types including IPOs and public-to-private transactions. Data for the United Kingdom in Zephyr start in 1997. For the period 1997 to 2003, Zephyr gives more complete coverage of the IPO and going-private deals. Although the two sources have considerable overlap, some deals are included in one source but not the other.

C. Sample

The FAME database includes every incorporated entity in the United Kingdom. I restrict the sample in two ways. First, I include only those firm-year observations that satisfy the auditing requirement, that is, for the accounting period before June 2000 I include the observation if annual sales exceed 350,000 pounds, and for the accounting period after June 2000 I include it if annual sales exceed one million pounds. Second, I include only medium and large firms, as defined by the Companies House,[12] since small firms are not required to submit a profit and loss statement and thus in most cases it is impossible to include them in the analysis.

I include only the following types of incorporated entities: Private Limited, Public Not Quoted, Public Quoted OFEX (Off Exchange), Public AIM (Alternative Investment Market), and Public Quoted.[13] I exclude the following company types: Assurance Company, Guarantee, Limited Liability Partnership, Not Companies Act, Public Investment Trust, Other, and Unlimited. This selection restricts the analysis to limited liability companies, the business structure that is most relevant to both the Companies Act and capital structure theories. In addition, I exclude financial firms (6,000s SICs), the public sector firms (9,000s SICs), and the regulated utility industry (4,900–4,939 SICs), since these companies are intrinsically different in the nature of their operations and accounting information, and since their capital structures are governed by regulation.

I use the following procedure to define the status of the firm. Firms involved in an IPO during the sample period are defined as private before the IPO and public after. Similarly, firms that went private during the sample period are defined as public before the going-private deal and private after. Firms not involved in an IPO or going-private deal within the sample period are defined according to their "Company type" value in FAME. Besides the London Stock Exchange, which is by far the most important U.K. stock exchange, U.K. companies may list on the London OFEX or internationally. The selection criterion I use includes IPOs regardless of the exchange on which the offering is made.

[12] In my sample selection I use a slightly different definition: any firm that had annual sales larger than 2,800,000 pounds and balance sheet total exceeding 1,400,000 pounds in at least one year in the sample period.

[13] "OFEX" is a market for dealing in unquoted securities. It is regulated by the FSA (Financial Services Authority) but it is not a Regulated Investment Exchange nor is it a member of the London Stock Exchange. Companies on OFEX tend to be smaller than those that apply for membership to AIM, the London Stock Exchange's Alternative Investment Market—a global market for smaller, growing companies.

Similarly, for nondeal firms, I classify firms as quoted if their company type in FAME is "Public Quoted," "Public AIM," or "public OFEX."[14]

D. Leverage, Issuance, and Repurchase Definitions

Capital structure theory models generate predictions on market debt ratios. Since market values for private firms are unobservable I measure their leverage using book values. I also use book values to measure the leverage of public firms in order to facilitate comparisons across these two groups. Previous empirical studies (e.g., Marsh (1982), Rajan and Zingales (1995), Leary and Roberts (2005), Fama and French (2002)) suggest that reliance on book leverage is not a serious limitation. With respect to particular proxies for leverage, the empirical literature proposes a number of ratios, including total liabilities to total assets, total debt to total assets, and total debt to net assets.[15] In my analysis I use the ratio of short-term debt plus long-term liabilities to total assets.[16]

With the exception of public firms' equity issues, for which a significant although incomplete data set exists in SDC's SEO database, I do not have data regarding capital issuances or repurchases. I therefore identify these events from the balance sheet in a manner similar to that used in previous papers such as Hovakimian, Opler, and Titman (2001), Korajczyk and Levy (2003), and Leary and Roberts (2005, 2006).[17] Since I do not have data on the sale of common and preferred stock in the statement of cash flows, which itself is not available for many of the medium-sized firms, I define a firm as issuing (repurchasing) equity if the change in its issued capital divided by its starting-period issued capital is larger (smaller) than 5% (−5%). Issued capital, a component of the shareholders' funds item on the balance sheet, is the face value of total outstanding shares. Hence, a percentage change in this item represents a percentage sale (or repurchase) of ownership in the company. Similarly, a firm is defined as issuing (retiring) debt if the change in the sum of short-term debt and long-term liabilities divided by the starting-period sum of these items is larger (smaller) than 5% (−5%). A percentage change in this measure represents a net percentage change in debt.[18]

Figure 2 presents the time series of public and private firms' capital raising and retiring activity using the issuance and repurchase definitions described above. Two important differences between public and private firms are apparent in the figure. First, in the equity market, public firms are much more active than private firms. While in each of the sample years 15% to 30% of the public firms issued equity capital, only 4% to 7% of the private firms issued

[14] Firms listed in OFEX and internationally represent a minority of the listings in my sample (85 and 9 IPOs, respectively, or less than 10% of all the IPOs).

[15] Rajan and Zingales (1995) discuss the relative merits and pitfalls of each of these measures.

[16] I also use short-term debt plus long-term debt to total assets, as well as short-term debt plus long-term liabilities to net assets, and the results remain qualitatively similar.

[17] In Section III.D I verify that my results are not sensitive to the identification of capital issues by using the SDC's SEO database to identify equity issues of public firms.

[18] I also use 3% and 7% cutoff points, and the results remain qualitatively unaffected.

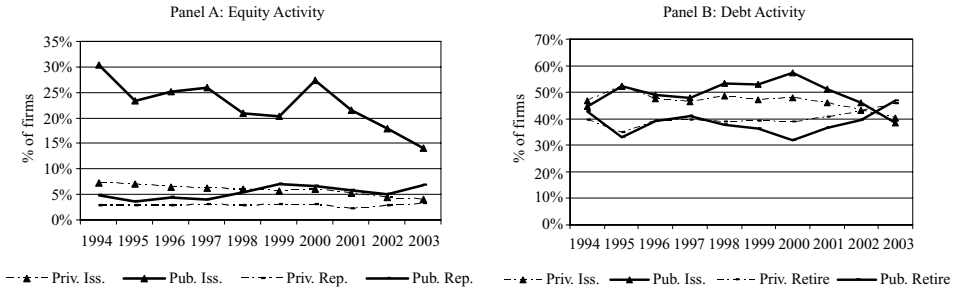

Figure 2. Equity and debt activity. Panel A (B) shows for each calendar year the percentage of private and public firms that were involved in equity (debt) issuance or repurchase/retirement activity.

equity. Similarly, although to a lesser extent, in each of the years public firms participated more in equity repurchases. Second, private firms do not seem to compensate for the relative lack of activity in the equity market by turning to the debt market disproportionately more. In each of the sample years, in both groups approximately 50% of the firms raised debt and approximately 40% retired debt, suggesting that public firms are more active in the external capital markets overall.

E. Summary Statistics

Due to data errors and scaling problems, for each accounting variable I study a truncated sample that excludes 0.5% of the observations at each tail. This procedure excludes approximately 8% of the observations. Data errors are a concern because companies do not file with the Companies House electronically. It is very likely that there are undetected data entry errors, especially in view of the large size and limited circulation of the database. Scaling problems arise from near-zero observations in total assets.[19] Since a priori it is plausible to assume that the characteristics distributions for private and public firms are different, I trim extreme values separately for each of these groups. All values are inflation-adjusted to 2003 pounds using the U.K. consumer price index.

Table I contains sample summary statistics. Reported at the top of the table is the number of firms that belong to each group (private and public) in at least one accounting period. As one may expect, public firms are on average older and larger, both in terms of their total assets and total sales. More important, however, are the striking differences between the capital structure and financial policy of public and private firms. Among all firm-year observations in which private firms raise capital, only 12% involve the equity market. For public firms, this figure is 38.4%. Similar but smaller differences are observed in relation to repurchase (retirement) activity. Among all

[19] I repeat the analysis with 1% exclusion criteria, and the results are qualitatively unaffected.

Table I

Entire Sample Summary Statistics

The third, fourth, and fifth columns report the summary statistics for the sample under study; the last three columns report the summary statistics for the U.S. public firms in Compustat and Italian private firms in Pagano et al. (1998). Equity issue (retirement) is a binary variable equal to one if the firm issued (repurchased) equity and zero if issued (retired) debt but not equity. Definitions of the rest of the variables are in the appendix. The total number of firms that appear in the FAME private sample is 54,285, and in the FAME public sample is 1,600. ** and *** denote statistical significance at the 5% and 1% level correspondingly.

		FAME			Compustat & PPZ		
		Obs	Mean	Median	Obs	Mean	Median
Equity issues	Private	84,448	0.120	0.000			
	Public	4,248	0.384	0.000	38,339	0.648	1.000
	Difference		−0.264***				
Equity retirements	Private	68,495	0.069	0.000			
	Public	2,914	0.133	0.000	27,925	0.205	0.000
	Difference		−0.064***				
Leverage	Private	339,373	0.327	0.275	19,816	0.390	0.380
	Public	9,863	0.227	0.199	83,569	0.296	0.206
	Difference		0.100***	0.076***			
Sht to Long	Private	328,444	0.637	0.727			
	Public	9,686	0.369	0.290	71,960	0.357	0.227
	Difference		0.267***	0.436***			
Net Leverage	Private	286,161	0.225	0.206			
	Public	9,288	0.113	0.126	83,131	0.112	0.115
	Difference		0.112***	0.080***			
Total Assets	Private	337,550	25,433	5,395	19,817	63,898	16,950
	Public	9,912	410,506	50,106	84,533	1,120,324	59,737
	Difference		−385072***	−44710***			
Turnover (sales)	Private	343,067	31,888	9,222	19,817	585,508	17,051
	Public	9,962	429,581	58,812	84,276	973,204	55,649
	Difference		−397692***	−49590***			
ROA	Private	275,512	0.083	0.074	19,817	0.120	0.110
	Public	8,558	0.049	0.087	70,368	−0.092	0.048
	Difference		0.033***	−0.014***			
CAPEX/total assets	Private	126,000	0.049	0.026			
	Public	7,700	0.070	0.042	82,386	0.077	0.043
	Difference		−0.020**	−0.016***			
Growth	Private	283,134	1.120	1.041			
	Public	8,909	1.226	1.066	68,160	1.348	1.096
	Difference		−0.106***	−0.025***			
Cash/total assets	Private	286,161	0.108	0.044			
	Public	9,288	0.124	0.063	84,250	0.191	0.084
	Difference		−0.016***	−0.019***			
Div Payer	Private	344,675	0.360	0.000			
	Public	10,012	0.718	1.000	84,523	0.240	0.000
	Difference		−0.358***				
Div to EBIT	Private	281,060	0.204	0.000			
	Public	7,493	0.275	0.234	51,878	0.098	0.000
	Difference		−0.071***	−0.234***			
Age	Private	344,306	23.248	16.041			
	Public	9,261	35.498	21.312			
	Difference		−12.250***	−5.271***			

firm-year observations in which private firms retire capital, only 6.9% involve the equity market. For public firms, this figure is 13.3%. These differences also translate into large differences in capital structures. Private firms have a debt ratio of 32.7% on average, while that of public is only 22.7% on average.

The differences in the financing of private and public firms are not limited only to their debt–equity composition. Private firms' average and median short-term debt as a percentage of total debt are 63.7% and 72.7%, respectively. The corresponding figures for public firms are only 36.9% and 29.0%. These differences are not only statistically highly significant, but also economically large. These differences suggest that by raising a larger fraction of short-term debt private firms can provide liquidity to their debt holders. While public firms can provide liquidity to their stakeholders by raising equity or potentially even public debt, private firms can do so only in the debt market by raising short-term debt.

Next, notice that the average and median growth rates and capital expenditures of public firms are larger than those of private firms. Since every business is private at the initial phase of its life, these differences suggest that it is those firms that have higher growth rates and in turn a greater need for capital that are more likely to go public. A closer look below at the subsample of going-public firms provides further support to this conjecture.

In terms of profitability, while private firms' average return on assets is larger, their median return on assets is smaller. This fact suggests that private firms' profitability is positively skewed, with the profitability of most firms being low and the profitability of few firms being very high. Looking at the cash to total assets ratio reveals that public firms have a larger cash base. This is a bit surprising given that economies of scale in cash management predict that public firms will hold less cash as a percentage of total assets.

For comparison purposes, the last three columns of Table I report summary statistics for the U.S. public firms in Compustat and the Italian private firms in Pagano et al. (1998).[20] It is important to point out that in line with the summary statistics for FAME, and in line with the level effect presented in Section I.A, both the Italian private firms in Pagano et al. (1998) and U.K. private firms in FAME have much higher leverage than both the U.S. public firms in Compustat and U.K. public firms in FAME. This is the case both in the means and in the medians.

Table II presents summary statistics for firms that went public or private within the sample period. For each firm the average characteristics are computed before and after the event; the means and medians across firms are reported. My data set consists of 1,113 IPOs and 271 going-private deals, of which 1,111 IPOs and 270 going-private deals are matched to the FAME database. Note that the numbers of IPOs and going-private deals in the data set are

[20] Since the Italian private firms sample in Pagano et al. (1998) is not available to me, I report only the statistics available in Table I (Panel A) of their paper. Italian currency is converted to GBP using the exchange rate 1GBP = 2,300 lire. All U.S. dollar values in Compustat are converted to GBP using end-of-calendar-year exchange rates. All GBP values are then inflation-adjusted to 2003 pounds using the U.K. consumer price index.

Table II

Going Public and Going Private Summary Statistics

For each variable, except age, its mean value is computed for each firm before and after the transition. For age, the age of the firm just before and after the transition is used. Means and medians are then computed across firms. The number of observations reported in each row in this table represents the number of firms that satisfy my inclusion criteria, and have the relevant data available before and after the transition. The difference column in the means statistics is a matched paired t-test of equality of means, and in the median statistics is the matched paired z-test of equality of medians using the Wilcoxon signed-rank test. Equity issue (retirement) is the number of periods in which a firm made an equity issue (repurchase) divided by the number of periods in which it made any type of capital issue (retirement). Definitions of the rest of the variables are in the appendix. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level correspondingly.

Panel A: Going Public							
		Means			Medians		
	Obs	Before	After	Difference	Before	After	Difference
Equity issues	148	0.41	0.61	−4.52***	0.33	0.63	−4.26***
Equity retirements	95	0.26	0.20	1.213	0.00	0.00	0.72
Leverage	502	0.30	0.21	6.58***	0.22	0.16	5.58***
Sht to Long	474	0.30	0.37	−4.42***	0.22	0.34	−5.43***
Net Leverage	437	0.16	0.06	5.20***	0.11	0.06	4.88***
Total assets	495	45,269	111,270	−4.39***	10,469	30,802	−17.58***
Turnover (sales)	515	45,549	89,586	−7.33***	11,434	27,957	−17.29***
ROA	228	0.12	0.04	6.52***	0.12	0.08	7.23***
CAPEX/total assets	347	0.12	0.08	4.01***	0.07	0.06	3.63***
Growth	368	1.44	1.30	3.61***	1.26	1.20	4.14***
Cash/total assets	437	0.13	0.16	−3.31***	0.07	0.10	−3.68***
Div Payer	765	0.28	0.42	−8.27***	0.00	0.00	−7.93***
Div to EBIT	333	0.15	0.21	−2.72***	0.04	0.18	−6.95***
Age	501	9.36	10.36		4.28	5.28	
Panel B: Going Private							
Equity issues	67	0.29	0.08	5.101***	0.20	0.00	4.576***
Equity retirements	41	0.12	0.03	1.891*	0.00	0.00	1.568
Leverage	122	0.22	0.30	−3.616***	0.20	0.24	−3.698***
Sht to Long	121	0.44	0.54	−3.005***	0.41	0.55	−2.64***
Net Leverage	108	0.12	0.19	−2.650***	0.14	0.18	−2.710***
Total assets	122	126,760	99,764	1.591	43,708	38,673	0.995
Turnover (sales)	120	175,408	104,163	2.125**	50,498	43,721	1.945*
ROA	108	0.09	0.04	3.060***	0.09	0.05	4.245***
CAPEX/total assets	71	0.06	0.06	0.429	0.05	0.03	2.194**
Growth	106	1.14	0.99	2.828***	1.05	0.97	4.931***
Cash/total assets	108	0.09	0.09	0.431	0.05	0.06	1.253
Div payer	214	0.72	0.24	13.111***	1.00	0.00	9.776***
Div to EBIT	59	0.30	0.27	0.373	0.19	0.02	2.348**
Age	172	35.60	36.60		25.77	26.77	

comparable to those presented in other papers (e.g., Weir and Laing (2002), Khurshed, Paleari, and Vismara (2004)).[21]

Panel A presents the IPO summary statistics and Panel B the summary statistics of the going-private transactions. A couple of important observations can be made. First, the differences between private and public firms in capital structure and financial policy I document for the whole sample follow through to the subsample of firms that change status. Specifically, after going public (private) there is a decrease (increase) in leverage and an increase (decrease) in the proportion of equity issues to total number of issues. Second, the subset of firms that go public have a higher growth rate of sales and capital expenditures before going public than the whole sample of privately held firms (see Table I). This fact suggests that those firms that need access to external capital are more likely to go public.

The summary statistics in this section are consistent with the hypotheses laid out in Section I. Private firms have economically and statistically higher debt ratios, and when they are issuing or retiring capital they are less likely to use equity to do so. Private firms that decide to go public have economically and statistically higher growth rates of sales and capital expenditures. In the following section I carefully test whether public and private firms are different in a manner consistent with all of the hypotheses presented in Section I under the ceteris paribus condition.

III. How Does Access to the Public Capital Market Affect Firms' Financial Policy?

A. Access to Capital Markets and Firm Debt Ratios

In this section I study the determinants of debt ratios using cross-sectional regressions, as in Rajan and Zingales (1995), Hovakimian et al. (2001), and Fama and French (2002). Table III presents the results.[22] All variables are scaled by the total assets of the firm to control for scale effects and to mitigate heteroskedasticity. In order to limit potential endogeneity issues, I lag the explanatory variables one period. In the first column, I focus on the four factors that the previous literature (see Rajan and Zingales (1995)) identifies as the major determinants of firms' debt ratios: size, asset tangibility, growth, and profitability. The results that I obtain for public firms are similar to those reported in earlier work. In particular, size and the proportion of tangible assets

[21] For the period 1998 to 2000, Weir and Laing (2002) report 116 public-to-private transactions including financial firms and 95 transactions excluding financial firms and firms with missing data. In my sample there are 118 public-to-private transactions of nonfinancial firms for the same period. For the period 1995 to 1999, Khurshed et al. (2004) report 415 IPOs of U.K. operating companies on the LSE markets only. For the same period, my sample includes 488 IPOs, of which 14 are on OFEX, 6 on international exchanges, and 153 have a missing stock exchange name.

[22] The results presented in this table are from pooled OLS regressions. Since the dependent variable is censored from both below and above (between zero and one), I also estimate these regressions with a Tobit regression with double censoring as in Hovakimian et al. (2001). The results are almost identical and therefore not reported.

Table III

Determinants of Leverage: Pooled Panel Regressions

Panel A reports the regression coefficients from pooled panel OLS with heteroskedasticity consistent t-statistics, corrected for correlation across observations of a given firm, reported in brackets. The dependent variable is Leverage. Pub X (Priv X) is the variable X interacted with a dummy equal to one (zero) if the firm is public and zero (one) if private. Definitions of the independent variables are in the appendix. Independent variables are lagged one period. The regressions include also a constant, year dummies, and two-digit SIC code dummies (not reported). The first three columns include the entire sample. The last column includes all private firms, while among the public firms it only includes those that were public throughout the sample period or that issued only secondary shares in their IPO. Panel B reports for each variable X the p-value of the test Priv X = Pub X. Panel C reports the total partial effect of the status of the firm. That is, for each observation of a private (public) firm, I compute its predicted leverage and its predicted leverage if it were public (private). Then I report the means of these predicted values, and the percentage of cases for which the predicted value of leverage if the firm is private is bigger than if it is public. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level correspondingly.

Panel A

	Entire Sample		Entire Sample		Entire Sample		Non-IPO or Sec IPO	
Public	−0.197	[6.64]***	−0.265	[7.31]***	−0.204	[5.51]***	−0.280	[5.88]***
Priv ROA	−0.491	[43.77]***	−0.503	[43.62]***			−0.504	[43.64]***
Pub ROA	−0.083	[3.30]***	−0.124	[4.09]***			−0.130	[2.96]***
Priv growth	0.044	[17.48]***	0.025	[10.19]***	0.006	[2.29]**	0.025	[10.20]***
Pub growth	−0.001	[0.31]	0.002	[0.47]	0.002	[0.38]	0.007	[1.12]
Priv CPX	0.015	[3.34]***	0.009	[2.10]**	0.000	[0.02]	0.009	[2.15]**
Pub CPX	−0.005	[3.29]***	−0.126	[3.05]***	−0.133	[3.11]***	−0.103	[1.97]**
Priv Tng	0.162	[22.49]***	0.195	[26.52]***	0.218	[29.03]***	0.195	[26.28]***
Pub Tng	0.138	[7.58]***	0.143	[7.06]***	0.144	[7.04]***	0.115	[4.32]***
Priv Size	0.016	[12.58]***	0.020	[15.39]***	0.020	[15.15]***	0.020	[15.37]***
Pub Size	0.029	[11.86]***	0.028	[10.44]***	0.025	[9.34]***	0.029	[9.11]***
Priv Sht to Tot Debt			0.067	[16.60]***	0.076	[17.96]***	0.067	[16.54]***
Pub Sht to Tot Debt			0.015	[1.14]	0.012	[0.84]	0.014	[0.75]
Priv Log Age			−0.056	[35.19]***	−0.054	[32.54]***	−0.056	[35.28]***
Pub Log Age			−0.010	[2.25]**	−0.011	[2.43]**	−0.008	[1.28]
Observations	96,979		92,898		93,601		91,091	
R^2	0.14		0.18		0.12		0.17	

Panel B

ROA	0.000***	0.000***		0.000***
Growth	0.000***	0.000***	0.405	0.004***
CPX	0.000***	0.001***	0.002***	0.032**
Tng	0.199	0.012**	0.001***	0.003***
Size	0.000***	0.006***	0.071*	0.006***
Sht to Tot Debt		0.000***	0.000***	0.004***
Log age		0.000***	0.000***	0.000***

Panel C

Predicted Lev^{Priv}	0.279	0.288	0.289	0.287
Predicted Lev^{Pub}	0.144	0.161	0.168	0.166
$\text{Lev}^{\text{Priv}} > \text{Lev}^{\text{Pub}}$	98.2%	97.2%	99.0%	96.6%

are highly significant and positively related to debt ratios, while profitability and growth opportunities, as proxied by the ratio of capital expenditures to total assets and growth in sales, are highly significant and negatively related to debt ratios.[23]

More important are the apparent differences between public and private firms. First, the dummy for firm status is highly significant, suggesting that public firms have lower leverage as predicted in hypothesis L1. However, since the status of the firm is also interacted with other explanatory variables, more care is needed in estimating the partial effect of firm status. I therefore compute the predicted leverage of each private (public) firm and its predicted leverage if it were public (private). In Panel C I report the average of these predicted values. The average predicted leverage if firms were private is 27.9% and only 14.4% if firms were public. In 98.2% of the firm-year observations, the predicted leverage if the firms were private is larger than the predicted leverage if the firms were public.

The determinants of leverage regressions can also help test hypothesis S2. Consistent with this hypothesis, Table III shows that the leverage of private firms is more sensitive to the firm's profitability, and that this difference is highly significant (see Panel B). Also consistent with this hypothesis is the relation between leverage and proxies for growth opportunities. While the leverage of public firms is negatively related with capital expenditures and the growth rate of sales, as predicted by the trade-off theory, the leverage of private firms exhibits the opposite relation with these variables. With respect to firm size, in line with the trade-off theory leverage is increasing in firm size for both types of firms; however, in line with hypothesis S2 the leverage of private firms is less sensitive to the firm's size. With respect to the sensitivity to asset tangibility, as predicted by the traditional static trade-off theory, the leverage of both types of firms increases as the fraction of their tangible assets increases. However, private firms' sensitivity is higher, in contrast to the implication of the sensitivity effect, although this difference is not robust to the fixed effects estimator (see Table IV, discussed below).

In the second and third columns of Table III, I provide estimates of the same pooled panel debt ratio regressions using different specifications. Following Faulkender and Petersen (2006), I include the composition of the firm's debt as a proxy for contracting problems, since one would expect firms for which it is difficult to write contracts constraining their behavior to issue shorter-term debt. Firm age may also affect the debt-equity composition because as firms age they become known to the market, which can expand their access to capital (Berger and Udell (1995), Petersen and Rajan (2002)). In the third column, I follow Hovakimian et al. (2001) and exclude profitability because profitability is significant in the leverage regressions not because it determines the target

[23] While historically leverage has been found to be positively correlated with size (e.g., Rajan and Zingales (1995) and Hovakimian et al. (2001)), Faulkender and Petersen (2006) report mixed results with respect to the relationship between size and leverage, which in their analysis depends on the definition of leverage, the inclusion of zero debt observations, and the conditioning on whether a firm has a debt rating or not.

Table IV
Determinants of Leverage

Panel A reports the regression coefficients. Except for the third column, the coefficient estimates are from a fixed effects model; in the third column the coefficients are estimated based on differences between firm-specific means (between-groups estimator). In the first column all firms are included. In the second column only firms that change status within the sample period are included. The last column includes all private firms, while among the public firms it only includes those that were public throughout the sample period or that issued only secondary shares in their IPO. Reported in brackets are the *t*-statistics. The dependent variable is leverage. Pub X (Priv X) is the variable X interacted with a dummy equal to one (zero) if the firm is public and zero (one) if private. Definitions of the independent variables are in the appendix. Independent variables are lagged one period. Panel B reports for each variable X the p-value of the test Priv X = Pub X. Panel C reports the total partial effect of the status of the firm (Public/Private). That is, for each observation of a private (public) firm I compute its predicted leverage and its predicted leverage if it were public (private). Reported are the means of these predicted values and the percentage of cases that the predicted value of leverage if the firm is private is larger than if it is public. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level correspondingly.

Panel A

	Entire Sample		Go Public or Go Private		Entire Sample Firm Specific Means		Non-IPO or Sec IPO	
Public	−0.223	[4.93]***	−0.323	[3.91]***	−0.242	[4.23]***	−0.274	[2.03]**
Priv ROA	−0.237	[43.06]***	−0.303	[5.42]***	−0.609	[47.94]***	−0.237	[42.71]***
Pub ROA	−0.064	[4.47]***	−0.066	[2.74]***	−0.098	[2.19]**	−0.071	[4.18]***
Priv growth	0.004	[3.20]***	0.019	[1.44]	0.034	[9.48]***	0.004	[3.09]***
Pub growth	−0.008	[2.69]***	−0.004	[0.89]	0.015	[1.21]	−0.012	[3.02]***
Priv CPX	0.016	[4.41]***	−0.057	[0.67]	0.013	[2.51]**	0.017	[4.49]***
Pub CPX	0.008	[0.35]	0.075	[1.78]*	−0.321	[3.07]***	−0.003	[0.12]
Priv Tng	0.122	[18.75]***	0.238	[4.62]***	0.195	[27.40]***	0.121	[18.37]***
Pub Tng	0.094	[4.46]***	0.158	[3.88]***	0.191	[6.59]***	0.093	[3.41]***
Priv Size	0.040	[22.95]***	0.016	[1.85]*	0.021	[17.15]***	0.041	[22.86]***
Pub Size	0.046	[12.33]***	0.037	[5.63]***	0.025	[6.03]***	0.045	[8.94]***
Priv Sht to Tot Debt	0.056	[25.40]***	0.034	[1.23]	0.047	[9.75]***	0.056	[25.45]***
Pub Sht to Tot Debt	0.019	[2.51]**	0.043	[3.25]***	0.017	[0.61]	0.012	[1.33]
Priv Log Age	−0.039	[8.32]***	−0.096	[3.70]***	−0.057	[34.57]***	−0.039	[8.32]***
Pub Log Age	0.002	[0.24]	−0.074	[2.87]***	−0.015	[2.42]**	0.026	[1.44]
Observations	92,898		2,105		92,898		91,091	
R^2	0.05		0.11		0.21		0.05	

Panel B

ROA	0.000***	0.000***	0.000***	0.000***
Growth	0.000***	0.101	0.125	0.000***
CPX	0.707	0.149	0.001***	0.447
Tng	0.184	0.060*	0.894	0.309
Size	0.180	0.006***	0.414	0.470
Sht to Tot Debt	0.000***	0.752	0.266	0.000***
Log Age	0.000***	0.071*	0.001***	0.000***

(*continued*)

Table IV—*Continued*

		Panel C		
Predicted Lev^{Priv}	0.290	0.302	0.296	0.290
Predicted Lev^{Pub}	0.171	0.003	0.173	0.173
$Lev^{Priv} > Lev^{Pub}$	98.7%	98.8%	95.6%	94.5%

debt ratio (trade-off theory predicts that it should be positively related to target debt ratios) but rather because it passively moves the firm's leverage away from its target. The results are not affected by these changes in specification, lending further support to hypotheses L1 and S2.

If the status of the firm proxies for some unobserved market friction, which its intensity changes when the firm changes its status, then the within-firm status effect should be similar to the between-firm status effect. To test this conjecture I estimate the determinants of leverage with a fixed effects estimator that identifies the effect of firm status on debt ratios from changes in debt ratios that occur when a firm changes status. More generally, the fixed effect estimator will exclude the possibility that the results presented so far are a consequence of an omitted endogenous time-invariant characteristic of the firm.

The results of these regressions are reported in the first two columns of Table IV. In the first column I include the entire sample; in the second column I include only the subsample of going-public and going-private firms. For completeness, the third column reports the results from a between-firm regression, where for each firm only one observation is included with its average characteristics over the years. As can be seen from this table, the effect of firm status is robust to an omitted time-invariant endogenous variable. Even when I use only the subsample of going-public and going-private firms, which comprises a much smaller sample, the differences with respect to the level effect and sensitivity to profitability remain statistically highly significant.

One concern with the results presented in this section is that instead of reflecting an ongoing difference in access to capital, they are simply an outcome of the one-time large equity inflow during an IPO. This alone would yield a measurably lower leverage ratio for a new public company. To determine whether this effect is at work, I repeat the analysis presented in Table III and Table IV, but of the public firms, I include only those firms that either were public throughout the entire sample period or went through a secondary IPO—an IPO in which insiders sell their shares and no equity capital flows to the firm. The results, reported in the last column of both of these tables, suggest that the lower debt ratios of public firms are not just a mechanical result of the one-time inflow of equity capital resulting from a primary IPO.

The results in this section are most closely related to the results reported in Faulkender and Petersen (2006). Focusing on the determinants of leverage,

they show that among publicly listed firms, firms that have access to the public bond market have higher debt ratios, providing further evidence in support of hypothesis L1. That is, when frictions in the debt (equity) channel are larger, firms exhibit a preference for equity (debt) financing. In this section I show that, consistent with hypothesis S2, the presence of market frictions has an effect not only on the level of leverage, as Faulkender and Petersen (2006) point out, but also on its sensitivity to other variables. It would be interesting to see whether the sensitivity effect results I present in this paper also hold in their sample.

B. Do Firms Rebalance Their Capital Structure?

The previous section provides significant evidence that relative to private firms' debt ratios, public firms' debt ratios are more subject to rebalancing activity in that they are more sensitive to firm characteristics such as growth, which are important determinants of *target* debt ratios, while they are less sensitive to firm performance (profitability), which affects the realization of *actual* debt ratios. In this section I test this hypothesis directly.

To test the hypothesis that public firms are more active in rebalancing their leverage, hypothesis S3, I estimate a partial adjustment model as in Shyam-Sunder and Myers (1999). I include the deficit of a firm as an explanatory variable to examine how much of the deficit or surplus is offset by changes in debt, after controlling for the deviation between actual and target leverage. As in Hovakimian et al. (2001), I estimate the target debt ratios with the predicted debt ratios from the leverage regressions (third column of Table III).[24] The results are reported in the first two columns in Table V.

The results are in line with the hypothesis that public firms' leverage adjusts to a target more quickly (hypothesis S3). The difference in the speed of adjustment between public and private firms' leverage is economically and statistically highly significant.

The difference between the coefficients on the deficit variable reveals that private firms rely on debt much more than public firms in financing their deficit. This result could be consistent with the pecking order hypothesis: Being more opaque, private firms exhibit stronger *ordering* in their external financing decisions such that they turn to equity financing only when their debt capacity is exhausted. However, as Chirinko and Singha (2000) point out, this result could also be consistent with the trade-off theory: Having a higher target debt ratio due to a higher cost of equity capital, private firms have a higher *proportion* of debt to equity financing. It is also plausible that this result is an outcome of some mixture of both the trade-off theory and the pecking order hypothesis.

[24] As an alternative to this procedure, I use as proxies for the target debt ratios the time-series averages of firms' leverage. As another alternative I use as proxies for the target debt ratios predicted values from the regressions including profitability. In both cases the results are qualitatively unaffected.

Table V

Partial Adjustment Model for Leverage

Panel A reports regression coefficients from a partial adjustment model for leverage. The dependent variable in the first and third columns is change in debt normalized by total assets, and in the second and fourth columns it is change in the debt ratio. Pub X (Priv X) is the variable X interacted with a dummy equal to one (zero) if the firm is public and zero (one) if private. Deficit is dividends plus change in fixed assets plus change in working capital minus profits normalized by total assets. In the third and fourth columns the flow of funds deficit is disaggregated into its components. Definitions of the rest of the variables are in the appendix. The regressions include also a constant, public dummy, year dummies, and two-digit SIC code dummies (not reported). Panel B reports for each variable X the p-value of the test Priv X = Pub X. Reported in brackets are heteroskedasticity consistent t-statistics, corrected for correlation across observations of a given firm. ** and *** denote statistical significance at the 5% and 1% level correspondingly.

Panel A

	Net Debt Change	Change in Debt Ratio	Net Debt Change	Change in Debt Ratio
Priv Deficit	0.7461	0.4076		
	[76.86]***	[57.17]***		
Pub Deficit	0.2807	0.1026		
	[12.62]***	[6.33]***		
Priv Dividends			0.7088	0.587
			[43.13]***	[31.68]***
Pub Dividends			0.1866	0.1008
			[2.23]**	[1.39]
Priv Investment			0.7214	0.2609
			[81.72]***	[30.03]***
Pub Investment			0.3427	0.0835
			[16.26]***	[4.60]***
Priv ΔWorking Cap.			0.7937	0.4314
			[97.21]***	[54.75]***
Pub ΔWorking Cap.			0.2722	0.0885
			[8.56]***	[3.32]***
Priv Profit			−0.7006	−0.6278
			[37.28]***	[32.69]***
Pub Profit			−0.1803	−0.1663
			[6.76]***	[6.58]***
Priv TMA Debt	0.102		0.0907	
	[25.62]***		[25.01]***	
Pub TMA Debt	0.2251		0.1833	
	[10.78]***		[8.93]***	
Priv TMA Lev.		0.1211		0.1348
		[30.28]***		[33.99]***
Pub TMA Lev.		0.212		0.218
		[11.87]***		[11.79]***
Observations	93,200	93,079	93,200	93,079
R^2	0.74	0.38	0.75	0.43

(*continued*)

Table V—*Continued*

		Panel B		
Deficit	0.000***	0.000***		
Dividend			0.000***	0.000***
Investments			0.000***	0.000***
Δ Working Cap.			0.000***	0.000***
Profit			0.000***	0.000***
TMA Debt	0.000***		0.000***	
TMA Lev.		0.000***		0.000***

Borrowing from Frank and Goyal (2003), a stronger test of the hypothesis that private firms rely on debt more than public firms in financing their deficit can be performed by disaggregating the firm's deficit into its components. If private firms are more reliant on debt in financing their deficit, this should be true for each of the deficit's components. The results from disaggregating the deficit are presented in the last two columns of Table V.

Disaggregating the deficit strengthens the earlier conclusions from the regressions in the first two columns of Table V. Private firms rely on debt much more than public firms in financing *each* of their deficit components—dividends, investments, change in working capital, and profitability. In addition, the difference in the speed of adjustment between public and private firms' leverage, as captured by the coefficients on the deviation between the actual and target debt ratio, is economically and statistically highly significant, as before.

In Table V I do not control for the volatility of the firm's profitability. This may raise two concerns with respect to the conclusion I draw from the results. First, Fischer, Heinkel, and Zechner (1989) show that in their dynamic trade-off model, the range of a firm's optimal debt ratio is positively related to the instantaneous variance of the unlevered firm's rate of return. Therefore, the relative differences I observe in the speed of adjustment between public and private firms' leverage may simply be due to private firms having a more volatile unlevered rate of return and in turn a wider optimal debt ratio range, resulting in more persistent debt ratios. Alternatively, the higher speed of adjustment of public firms may capture the fact that the leverage of public firms is more volatile because public firms' profitability is more volatile. To address these potential caveats, I repeat the analysis in Table V after decomposing the sample firms into quintiles according to the standard deviation of profitability (ROA), where the standard deviation is computed using the time-series data available for each firm. The results of this additional analysis are similar to those reported earlier in Table V and thus are untabulated to conserve space. In each of the control groups, the speed of adjustment of private firms' leverage is slower than that of public firms, and private firms rely on debt more than public firms in financing their deficit.

The results presented in this section can shed light on a more basic question—do firms rebalance their capital structure at all? Leary and Roberts (2005) argue

that firms do try to return their capital structure toward some long-run optimal level once adjustment costs are taken into account. However, Chen and Zhao (2005) argue that mean reversion in debt ratios arises from an accounting identity in leverage changes regardless of which theory better describes financing decisions, and that opposite inferences can be drawn depending on whether financing decisions or leverage ratio changes are studied. While the two arguments are able to explain the previous empirical regularities—mean reversion in debt ratios and a strong negative relationship between profitability and leverage—the results in this paper, and specifically in this section, cannot be accommodated by Chen and Zhao's hypothesis. In line with Leary and Roberts's (2005) argument, the larger adjustment costs faced by private firms can explain why their debt ratios exhibit a slower speed of adjustment relative to their public counterparts.

C. The Decision to Raise or Retire Capital

So far, I examine the effect of access to capital on debt ratios and changes in debt ratios. However, it is also important to examine directly how access to capital affects firms' capital issuance and retirement decisions. In this section I explore the decision to raise or retire capital, which allows me to test the hypothesis that public firms have more active financial policies (hypothesis S1).

A natural way to model the decision of the firm to access the capital markets is to use a multinomial logit model. The firm can do nothing (the base case), retire capital, or raise capital. The firm is defined as issuing (retiring) capital if it issues (retires) both debt and equity, only issues (retires) debt, or only issues (retires) equity. Similar to Leary and Roberts (2006), I control for the firm's deficit and for variables that proxy for the firm's cash target. The results are presented in Table VI.

The sign on the coefficient estimates in the multinomial logit model shows whether a change in the explanatory variable increases or decreases the odds ratio of the indicated alternative relative to the base case of doing nothing. Two main results emerge from an examination of Table VI. First, the coefficients reported in Panel A are generally in the predicted direction. Both public and private firms raise capital when they have a deficit and retire capital when they have a surplus, suggesting that firms do not raise external capital unless they have to. With respect to size, the larger the firm the less likely it will raise or retire capital, consistent with economies of scale in cash management. Turning to growth opportunities, as proxied by a firm's growth in sales, the likelihood that the firm will issue (retire) capital is positively (negatively) related to an increase in the firm's growth opportunities, consistent with firms raising cash to fund future investments. Firms with higher levels of net working capital are less likely to raise capital and more likely to retire capital, consistent with firms that have large trade accounts with creditors having higher cash targets.

Second, the results are in line with the hypothesis that public firms have more active financial policies (hypothesis S1). The public dummy variable is

Table VI

Determinants of the Decision to Issue or Retire Capital

The coefficient estimates are from a multinomial logit. Reported in brackets are heteroskedasticity consistent t-statistics, corrected for correlation across observations of a given firm. The dependent variable is zero for firms that take no action (the base category), one for firms that retire debt or repurchase equity, and two for firms that issue debt or equity. Deficit is change in fixed assets minus (cash and equivalents at the beginning of the period plus profit), divided by total assets. Z-score is Altman's Z-score. Pub X (Priv X) is the variable X interacted with a dummy equal to one (zero) if the firms is public and zero (one) if private. Definitions of the rest of the variables are in the appendix. All independent variables except Deficit are lagged one period. The regression includes also a constant, year dummies and two-digit SIC code dummies (not reported). Panel B reports for each variable X the p-value of the test of equality of coefficients Priv X = Pub X. Panel C reports the total partial effect of the status of the firm (Public/Private). That is, for each observation of a private (public) firm I compute its predicted probability of choosing the alternative at the top of the column, and its predicted probability of choosing that alternative if it were public (private). Then I report the means of these predicted values, the p-value for the test of equality of the means, and the percentage of observations that the predicted probability if the firm is public is bigger than if it is private. In the last three lines of Panel C I do the same thing but for the no action alternative. In Panel D, I compare between public and private firms' partial effect of each of the explanatory variables on the odds ratio, p[Action]/p[No Action], accounting for the nonlinearity of the model (for more details see Section III.C), where "Action" refers to the alternative at the top of the column and "No Action" refers to the base alternative of doing nothing. For each variable, in the first (second) line I report the partial effect on the odds ratio calculated at the mean of the sample characteristics using the public (private) firms' estimated coefficients (the same overall sample means are used for public and private firms' observations). For the third line of each variable, I first compute for each private (public) firm the partial effect of each explanatory variable on the odds ratio, and the partial effect if it were public (private). I then report the percentage of observations in which the partial effect if the firm were public is larger in absolute value than the partial effect if it were private. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level correspondingly.

Panel A

	Issue	Retire/Repurchase
Public	0.7025	0.696
	[3.47]***	[3.29]***
Priv Deficit	2.8633	−2.1577
	[39.61]***	[33.01]***
Pub Deficit	4.4387	−1.4903
	[12.11]***	[4.95]***
Priv Size	−0.0987	−0.1252
	[13.09]***	[15.99]***
Pub Size	−0.1055	−0.1362
	[6.16]***	[7.26]***
Priv Growth	0.1613	−0.0059
	[6.12]***	[0.21]
Pub Growth	0.117	−0.1331
	[1.64]	[1.55]
Priv Z-score	0.2876	−0.0511
	[15.19]***	[3.01]***
Pub Z-score	0.3169	−0.0645
	[3.60]***	[0.78]
Priv Net Working Cap.	−0.3005	0.8685
	[5.59]***	[16.12]***
Pub Net Working Cap.	−0.5222	0.8102
	[1.80]*	[2.64]***
Pseudo-R^2	0.071	
Observations	122,677	

(*continued*)

Table VI—*Continued*

Panel B			
Deficit		0.000***	0.030**
Size		0.687	0.558
Growth		0.558	0.155
Z-score		0.745	0.874
Net Working Cap.		0.447	0.850
Panel C			
Predicted Pr^{Pub}[Action]		51.11%	39.93%
Predicted Pr^{Priv}[Action]		48.15%	38.73%
P-value(Pr^{Pub}[Action] = Pr^{Priv}[Action])		0.000***	0.000***
Pr^{Pub}[Action] > Pr^{Priv}[Action]		78.3%	67.6%
Predicted Pr^{Pub}[No Action]		8.96%	
Predicted Pr^{Priv}[No Action]		13.11%	
P-value(Pr^{Pub}[No Action] = Pr^{Priv}[No Action])		0.000***	
Pr^{Pub}[No Action] > Pr^{Priv}[No Action]		2.0%	
Panel D			
Deficit	PE^{Pub}	24.58	−6.40
	PE^{Priv}	10.09	−6.03
	$PE^{Pub} > PE^{Priv}$	98.73%	58.01%
Size	PE^{Pub}	−0.58	−0.58
	PE^{Priv}	−0.35	−0.35
	$PE^{Pub} > PE^{Priv}$	94.87%	98.99%
Growth	PE^{Pub}	0.65	−0.57
	PE^{Priv}	0.57	−0.02
	$PE^{Pub} > PE^{Priv}$	70.65%	99.99%
Z-score	PE^{Pub}	1.76	−0.28
	PE^{Priv}	1.01	−0.14
	$PE^{Pub} > PE^{Priv}$	95.45%	99.48%
Net Working Cap.	PE^{Pub}	−2.89	3.48
	PE^{Priv}	−1.06	2.43
	$PE^{Pub} > PE^{Priv}$	99.09%	97.20%

highly significant, both in the issuance and repurchase decisions. That is, even after controlling for variables that previous literature finds to be relevant in the decision to raise or retire capital, whether a firm is private or public remains an important determinant of these decisions. However, as in the regressions above, one needs to be careful in assessing the partial effect of firm status since the status is also interacted with other explanatory variables. Therefore, for each private (public) firm I compute the predicted probability it will choose each of the three alternatives and the predicted probability it will choose each of the three alternatives if the firm were public (private). In Panel C I report the average of these predicted values and the *p*-value for the test of equality of means. The average predicted probability of issuing, retiring, and doing nothing if firms were public is 51.11%, 39.93%, and 8.96%, respectively. The same values if firms were private are 48.15%, 38.73%, and 13.11%. The differences in these values between public and private firms are highly significant. In only 2.0%

of the observations the predicted probability of doing nothing is larger when the firm is public than if it is private. This result is a reflection of the patterns presented in Figure 2.

If private firms' financial policy is more passive than that of public firms, then it follows that the marginal effect of the explanatory variables on the decision to raise or retire capital should be smaller, in absolute value, for private firms than for public firms. However, since the logit model is not linear, a comparison of the coefficients in Panel B can be misleading. To see this, note that

$$\frac{\partial P(action = j \mid x)}{\partial x_i} = \frac{\partial \left[\exp(x\beta_j) / \left(1 + \sum_{h=1}^{J} \exp(x\beta_h) \right) \right]}{\partial x_i} \neq \beta_{j,i}. \tag{1}$$

In a logistic framework, it is usually easier to work with odds ratios than with probabilities. Accordingly, I compare the partial effects of the explanatory variables on private and public firms' odds ratio of an action (issue or retire) relative to the alternative of doing nothing. Specifically, the expression of interest is

$$\frac{\partial odds\ ratio\,(issue\ vs.\ do\ nothing \mid x)}{\partial x_i} = \exp(x\beta_{issue})\beta_{issue,i}, \tag{2}$$

where

$$odds\ ratio(issue\ vs.\ do\ nothing \mid x) = \frac{P(isssue)}{P(do\ nothing)} = \exp(x\beta_{issue}). \tag{3}$$

Obviously, the expression in equation (2) depends on the value of the explanatory variables. Therefore, in Panel D, in the first two lines of each variable I report the values of the expression in equation (2) for both public and private firms at the mean of the sample characteristics. In the third line of each variable, I first compute for each private (public) firm the partial effect of the given explanatory variable on the odds ratio (the expression in equation (2)), and the partial effect if it were public (private). I then report the percentage of observations in which the partial effect is larger in absolute value if the firm were public versus if it were private. The results in Panel D show that in absolute value, the partial effect of each variable on the odds ratio of issuing or retiring capital relative to doing nothing is larger in the public firms' case than in the private firms' case. The frequency numbers in the third line of each variable show that these differences are highly significant.

One concern in relation to the results presented in this section arises from the way I classify the financing decisions. Specifically, I do not include cases in which the firm retires one type of security and issues the other because such instances cannot be classified as either capital issuance or capital retirement. However, because these cases reflect active financial policy, if a large fraction of private firms were engaged in such activity then the inference from the

Table VII
Distribution of Financing Decisions

The table provides the distributions of the financing decisions of private and public firms. The figures are in percentages of the total firm-year observations.

Panel A: Private Firms				
	Debt			
Equity	Retire	Nothing	Issue	Total
Retire	1.12	0.33	1.37	2.82
Nothing	35.52	12.51	43.11	91.14
Issue	2.64	0.57	2.83	6.04
Total	39.28	13.41	47.31	100.00
Panel B: Public Firms				
Retire	2.40	0.46	2.56	5.42
Nothing	27.72	10.24	33.90	71.86
Issue	7.45	1.30	13.97	22.72
Total	37.57	12.00	50.43	100.00

multinomial logit model presented above would be misleading. To address this issue, in Table VII I present the distribution of the financial decisions. The data provide no support to this concern. While 2.56% of the time public firms issue debt and retire equity, private firms do so only 1.37% of the time. Further, while 7.45% of the time public firms issue equity and retire debt, private firms do so only 2.64% of the time.

The results so far suggest that public firms engage in capital issuance more than private firms because of the lower costs they face when raising capital. However, an alternative explanation to these results may be based on potential differences in public and private firms' dividend policies. Several theories of dividend policy are motivated by market frictions arising from agency problems between the manager and the owners of the firm.[25] For example, Easterbrook (1984) suggests that dividends may help reduce the agency costs associated with the separation of ownership and control. He argues that dividend payments force managers to raise funds in the financial markets more frequently than they would in the absence of dividends, thereby subjecting managers to frequent scrutiny by outside professionals. Given that the dividends are intended to solve an agency problem that exists only within the context of public firms, Easterbrook's argument implies that closely held firms (e.g., private firms) will have lower dividend payouts as well as a more passive capital issuance policy than otherwise identical firms that are more prone to owner–management conflicts of interest (e.g., public firms). The summary statistics in Table I and Table II are in line with his argument.

[25] For a good review of the dividend policy literature, see Lease et al. (2000).

To test whether Easterbrook's argument can indeed explain the fact that public firms are more likely to issue capital than private firms, I compare the decision to issue capital of private companies and non-dividend-paying public companies. The results (untabulated) remain qualitatively the same. That is, the probability of issuing capital by public and private firms is largely unaffected by the exclusion of public dividend-paying firms.

Overall, the results in this section strongly support hypothesis S1. That is, private firms are less likely to raise or retire capital, even after controlling for observable characteristics that previous literature has shown to affect the decision to visit the external capital markets.

D. The Debt–Equity Choice

In the previous section I analyze the effect of access to the capital markets on the decision to raise or retire capital. In this section I study the choice of financial instrument conditional on the decision to issue or retire capital. Studying this decision allows me to test hypotheses L2 and S4, which posit that compared to their public counterparts, private firms exhibit an aversion to equity and their decision is less in line with the target adjustment hypothesis of the trade-off theory.

To explore how access to capital affects the choice of financial instrument, I estimate two probit models of the debt–equity choice, one for issuances and the other for repurchases. I model the debt–equity choice in the spirit of Hovakimian et al. (2001), using the predicted debt ratios from the leverage regressions (third column of Table III) as proxies for the target debt ratios.[26] As in their paper, to test the target adjustment hypothesis I control for profitability during the period the issuance decision is made, because profitability passively moves the firm's leverage from its starting-period leverage. According to the target adjustment hypothesis of the static trade-off theory, the larger the target leverage relative to the starting-period leverage and the more profitable the firm, the more likely the firm will choose debt in the issuance decision and equity in the repurchase decision.

The results, reported in the first two columns of Table VIII, are in line with the predictions of the level and sensitivity effects. First, consistent with the level effect (hypothesis L2), public firms are more likely to choose equity in the case of both issuance and repurchase decisions. The public dummy variable is highly positively significant. However, as in the regressions above, one needs to be careful in assessing the partial effect of firm status since the status of the firm is interacted with other explanatory variables. Therefore, for each private (public) firm I compute the predicted probability it will choose equity and the predicted probability it will choose equity if the firm were public (private). In Panel C I report the average of these predicted values. The average predicted

[26] As in Section III.B, I also proxy for the target debt ratios using the time-series averages of firms' leverage, as well as the predicted values from the regressions including the profitability. The results remain qualitatively the same.

Table VIII
The Debt–Equity Choice

The coefficient estimates are from a probit model. In the Issuance (Repurchase) column, only firm-year observations in which the firm issued (repurchased) equity or issued (retired) debt are included, and the dependent variable is equal to one if the firm issued (repurchased) equity and zero if issued (retired) debt. The last column is identical to the first except that the identification of equity issues for public firms is based on the SEO data set in SDC (for details see Section III.D). Pub X (Priv X) is the variable X interacted with a dummy equal to one (zero) if the firm is public and zero (one) if private. Definitions of the independent variables are in the appendix. The regression also includes year and two-digit SIC code dummies, and a constant (not reported). Reported in brackets are the heteroskedasticity-consistent t-statistics, corrected for correlation across observations of a given firm. Panel B reports for each variable X the p-value of the test Priv X = Pub X. Panel C reports the total partial effect of the status of the firm (Public/Private). For each observation of a private (public) firm I compute its predicted probability of issuing equity and its predicted probability of issuing equity if it were public (private). Then I report the means of these predicted values, the p-value for the paired t-test on equality of the means, and the fraction of observations that the predicted probability of issuing equity if the firm is public is bigger than if it is private. In Panel D, I compare between public and private firms partial effect of each of the explanatory variables on the probability of a positive outcome, accounting for the nonlinearity of the model (for details see Section III.C). For each variable, in the first (second) line I report the partial effect on the probability of a positive outcome calculated at the mean of the overall sample characteristics using the public (private) firms' estimated coefficients. In the third line of each variable, I first compute for each private (public) firm the partial effect of each explanatory variable on the probability of a positive outcome, and the partial effect if it were public (private). I then report the fraction of observations in which the partial effect if the firm were public is larger in absolute value than the partial effect if it were private. * and *** denote statistical significance at the 10% and 1% level correspondingly.

	Panel A		
	Issuance	Repurchase	Issuance (SDC)
Public	0.5151	0.1691	0.1492
	[12.16]***	[3.09]***	[3.10]***
Priv TMA leverage	−1.5963	1.1541	−1.6032
	[26.00]***	[12.73]***	[25.96]***
Pub TMA leverage	−2.4182	1.7379	−2.1809
	[9.14]***	[4.20]***	[6.80]***
Priv ROA	−0.0725	0.3743	−0.0602
	[0.56]	[3.05]***	[0.46]
Pub ROA	−1.0722	0.0239	−1.4341
	[5.32]***	[0.08]	[6.08]***
Pseudo-R^2	0.0971	0.0344	0.0869
Observations	29,831	28,084	29,604
	Panel B		
TMA leverage	0.003***	0.168	0.076*
ROA	0.000***	0.256	0.000***
	Panel C		
Predicted $\Pr^{\text{Pub}}$[Equity]	0.148	0.078	0.082
Predicted $\Pr^{\text{Priv}}$[Equity]	0.064	0.058	0.064
P-value($\Pr^{\text{Pub}}$[Eq.] = $\Pr^{\text{Priv}}$[Eq.])	0.000***	0.000***	0.000***
$\Pr^{\text{Pub}}$[Equity] > $\Pr^{\text{Priv}}$[Equity]	0.987	0.866	0.635

(*continued*)

Table VIII—*Continued*

		Panel D		
TMA Leverage	PE^{Pub}	−0.488	0.227	−0.260
	PE^{Priv}	−0.172	0.123	−0.172
	$PE^{Pub} > PE^{Priv}$	0.995	0.986	0.898
ROA	PE^{Pub}	−0.217	0.003	−0.171
	PE^{Priv}	−0.008	0.040	−0.006
	$PE^{Pub} > PE^{Priv}$	0.999	0.000	1.000

probability of issuing (repurchasing) equity if firms were public is 0.148 (0.078) and only 0.064 (0.058) if firms were private. In 98.7% (86.6%) of the firm-year observations, the predicted probability of issuing (repurchasing) equity if the firm were public is larger than the same predicted probability if the firm were private.

Second, both types of firms behave in accordance with the target adjustment hypothesis of the trade-off theory. The smaller the firm's actual leverage relative to its target and the higher the firm's profitability, the more likely the firm is to increase its leverage by choosing debt in the issuance decision and equity in the repurchase decision. However, in line with the sensitivity effect (hypothesis S4), and with the exception of profitability in the case of the repurchase decision, these relations are stronger for public than private firms, and as can be seen in Panels B and D these differences are statistically significant.

As noted above, contrary to hypothesis S4, the profitability effect is larger for private firms in the repurchase regression. This result is probably a consequence of banks' refusal to rollover debt to unprofitable private firms. As Table I shows, the debt of private firms has on average much shorter maturity. Since debt retirements in this paper are defined as a significant reduction in the debt level, this result probably corresponds more to the inability of the firm to rollover its debt when it is unprofitable than active retirement of its equity when it is profitable.

In the analysis in this section thus far, I exclude dual issues (dual repurchases), that is, instances in which the firm issues (repurchases) both equity and debt, from the probit regression for issuances (repurchases).[27] I do so because dual issues (repurchases) cannot be classified as either a debt issue (repurchase) or an equity issue (repurchase).[28] This exclusion raises the possibility that the sample is not representative of the population if dual issues (repurchases) represent a significant portion of all capital issuance (repurchase) activity. However, Table VII shows that this is not the case. For private firms, dual repurchases (issues) represent only 2.73% (5.60%) of all capital repurchases (issues), and

[27] This is also the approach taken in earlier studies such as Marsh (1982) and Hovakimian et al. (2001). One important exception is Hovakimian, Hovakimian, and Tehranian (2004), who focus their analysis on dual debt and equity issues.

[28] Because I do not observe the amount of capital repurchased or issued through the equity channel, it is also impossible to classify these cases according to the relative sizes of the debt and equity financing.

for public firms, dual repurchases (issues) represent only 5.91% (23.61%) of all capital repurchases (issues).[29] Although for public firms the fraction of dual issues, 23.61%, represents a nontrivial fraction of all capital issues, the figures in Table VII suggest that including dual issues would not affect the conclusion in this section that public firms are more likely to rely on equity financing relative to private firms. Specifically, when I exclude dual issues, equity issues represent 6.73% (19.35%) of all capital issues of private (public) firms, whereas when I include dual issues, counting them as both equity and debt issues, equity issues represent 11.32% (31.06%) of all capital issues of private (public) firms.[30]

The analysis in this section may suffer from the fact that I do not differentiate between true seasoned equity offerings (SEOs) and stock-swap merger "equity issues" payments, especially since the period under study encompasses significant M&A activity (Rossi and Volpin (2004)). Given that public firms are probably involved in M&A transactions more often than private firms, the fact that public firms are more likely to choose equity in their issuance decision—as suggested by Table VIII—may be a result of considerations related to the M&A transactions (cash vs. equity financing), which have nothing to do with access to capital markets. To address this potential pitfall I repeat the analysis in this section, but instead of identifying equity issues as significant changes in the "Issued Capital" balance sheet item, I use SDC's U.K. offerings database to identify equity issues of public firms.[31] Since SDC's SEO database is not 100% complete, this approach may miss some equity issues of public firms. However, this approach ensures that we do not count other activities, such as equity payments in M&A transactions, as equity issues.

The U.K. offerings database in SDC contains 2,462 ($191.2 billion) non-IPO equity offerings of companies that are not in the financial, utility, or government sectors in the period 1993 to 2003. There are 388 offerings that I am unable to match into the FAME database, and 805 deals that match into FAME but not into the sample firm-period.[32] Finally, because between two accounting statements of the same firm there may be more than one deal, the remaining 1,269 matched deals translate into only 942 identified equity issues in the sample.

[29] The figure 2.73% is equal to 1.12/(1.12 + 0.33 + 1.37 + 35.52 + 2.64). The other ratios are computed similarly.

[30] The figure 6.73% is equal to (2.64 + 0.57)/(2.64 + 0.57 + 1.37 + 43.11). The figure 11.32% is equal to (2.64 + 0.57 + 2.83)/(2.64 + 0.57 + 2.83 + 1.37 + 43.11 + 2.83). The figures 19.35% and 31.06% are computed similarly.

[31] Unfortunately, while SDC has information on public equity offerings, it has extremely limited information on private placements. Similarly, the number of public debt offerings recorded for the U.K. is very small, and as one may expect, there is absolutely no information on private (bank) debt. For these reasons, I am able to use SDC only for the purpose of identifying public firms' equity offerings.

[32] The 805 deals that match into FAME but not into the sample firm-period include 281 deals that are dropped because the SIC code according to FAME is 6xxx (275) or 49xx (3) or missing (3), 141 deals that belong to firms that do not satisfy the size criteria, and 383 deals that are before the first or after the last statement in FAME.

A comparison of the two procedures that are used in this paper to identify equity issues of public firms suggests that the balance sheet approach, which is used throughout this paper to identify all types of capital activity of both public and private firms, does a reasonably good job. Of the 942 equity issues identified according to SDC, 836 (89%) of them are also identified as equity issues using the balance sheet approach. On the other hand, a significant number of observations identified as equity issues using the balance sheet approach do not match any issue in the SDC database. Out of a total of 2,347 public firm equity issues identified under the balance sheet approach, only 836 (36%) correspond to an equity issue in SDC. This result may obtain for several reasons. First, some of the changes in the "Issued Capital" item represent equity payments in M&A transactions and not an equity issue—this explanation is the motivation for the alternative identification approach in the first place. Second, SDC has very limited information on private placements. To the extent that some of the equity issues of public firms are not conducted through an equity offering, SDC may understate the number of equity issues. Finally, it may also be the case that the balance sheet approach erroneously classifies some equity issues, and as a result overstates the number of equity issues.

In the last column of Table VIII, I repeat the analysis of the debt–equity choice for capital issues, this time identifying private firms' capital issues as before but identifying public firms' equity issues using the matched issues from the SDC U.K. offerings database. The results show that while the public dummy variable in Panel A becomes smaller, as expected given that using SDC I identify a significantly smaller number of public firms' equity issues (942 vs. 2,347), it remains highly statistically significant. Panel C shows that equity payments made in M&A transactions cannot explain the previous findings. These results also indicate how strong the effect of access to capital is on the debt–equity choice. The effect of the public dummy variable remains highly statistically significant, despite the fact that, as defined, private firms' equity issues potentially include changes in the issued capital due to M&A activity and public firms' equity issues do not include most of the private equity placements.

E. Robustness

In the analyses presented so far, I include firms in the sample regardless of whether they are subsidiaries of other companies, and regardless of whether their accounts are consolidated or not. Companies with unconsolidated balance sheets report an affiliate's net assets as a long-term investment on their balance sheet. Hence, these firms would (incorrectly) appear to have lower leverage than otherwise identical firms that report consolidated balance sheets. In addition, in an attempt to window-dress their balance sheet, they may place the debt they take on in less visible affiliated companies and then borrow it back via interfirm trade credit. Another problem that arises from including all the firms is that it may not be appropriate to treat a subsidiary of a public company as private, even if the firm itself is not listed on a public exchange. To address such concerns, I repeat all the analyses with consolidated accounts of

independent companies only. The results (untabulated) remain qualitatively the same.

In addition, the analysis presented so far ignores potential correlation of the residuals across firms. This approach is therefore likely to understate standard errors and affect statistical inferences. To address this issue, I reestimate all the linear regressions using the Fama-MacBeth (1973) approach. Again, the results (untabulated) remain qualitatively unaffected.

IV. What Is Fundamentally Different between Public and Private Firms?

Up to this point, the analysis shows that the larger frictions private firms face when visiting the external equity capital markets have significant effects on various dimensions of firms' financial policies. However, the paper has been largely silent on what exactly these market frictions are. In this section I turn to this topic. Specifically, I ask what fundamental firm characteristics make private equity more costly than public equity.

One fundamental difference between private and public firms is their ownership structure, and as a result the extent to which their shareholders and management value control. Control considerations make equity financing more attractive for public than for private firms for three main reasons. First, firms controlled by a major shareholder should be reluctant to use stock financing when this causes the controlling shareholder to risk losing control (Amihud, Lev, and Travlos (1990), Stulz (1988)).[33] Since private firms are held by at most a few shareholders, each of which has significant control over the firm, whereas public firms are held by many atomistic shareholders, each of which has virtually no control over the firm, the cost of giving away control is higher for shareholders of a private firm than for those of a public firm. Indeed, maintaining control is probably a big reason for private firms to remain private, suggesting that value of control may be especially high for private firms that could have gone public but chose not to do so. Because equity gives away control, this implies that the cost of issuing equity is higher for private firms than public firms. Second, Morellec (2004) shows that given the separation between management and ownership that is typical among public (but not private) firms, managers of public firms may rationally seek to dilute the control of any single shareholder, and as a result may find issuing equity especially attractive. Specifically, Morellec (2004) shows that absent a market for corporate control, the firm is generally underlevered as the manager's empire-building desires distort the firm's financing and investment policies.[34] Third, given private equity does not offer minority shareholders the same disclosure and protections

[33] Dyck and Zingales (2004) and Nenova (2003) document substantial benefits to corporate control in Europe.

[34] Morellec (2004) also shows that because of manager-specific human capital and the costs imposed by control transactions, the manager is partially entrenched and as a result the threat of a control change limits but does not eliminate the manager's empire-building desires and the tendency to underlever the firm.

that they would enjoy with public equity, minority shareholders may be less willing to purchase private equity, thereby making it more expensive.

Another important distinction between private and public firms is the level of information asymmetry between insiders and outsiders at the time capital is raised. Since private firms are obviously more opaque to outsiders, and since the value of equity, being the more junior security in the capital structure, is more sensitive to information asymmetry than the value of debt (e.g., Myers and Majluf (1984), Noe (1988)), the cost of equity relative to debt will be higher for private firms than for public firms, and thus equity will again be less attractive than debt for private firms.[35]

Unfortunately, I do not have variables that can directly measure ownership concentration or information asymmetry for the full sample, and as a result I cannot control for these characteristics in the analysis presented so far. While FAME includes ownership information, this information is static and thus it is available only for the last cross-section. More importantly, ownership data for public firms are not available. The number of shareholders is typically coded as one, with the name of the shareholder given as "BULK LIST OF SHAREHOLDERS." FAME sometimes counts the number of institutional holders, but again, this procedure severely overestimates ownership concentration. With respect to transparency, the status of the firm is in essence the best proxy available, as no other direct measure of transparency exists in the data set.

In order to investigate whether value of control and information asymmetry drive the differences between the cost of private and public equity, I resort to observed variations within the private firm sample at the most recent reporting date. The ownership module in FAME provides information both on the number of shareholders and the percentage holdings by the top shareholders. Since firms are not required to provide this information to the Companies House, BvD collects and tries to cross-validate this information from several sources. However, as will become evident below, the ownership data are far from perfect.

There are several candidate proxies for ownership concentration. For example, in their study of the choice of payment method in European mergers and acquisitions, Faccio and Masulis (2005) use the voting stake held by the largest controlling shareholder. In this paper, I use the total number of shareholders. I do so for two reasons. First, of the 53,626 private firms in the last cross-section, the percentage ownership is missing in 21,963 firms while the number of shareholders is missing in only 6,103 firms. Second, the much larger variation that the number of shareholders exhibits seems to suggest that it is better populated. Of the 29,561 firms coded as wholly owned, the number of shareholders is larger than one, ranging from 2 to 22, in 18,481 firms (which represent more than 50% of the cases with available percentage information). In contrast, of the 15,376 firms coded as having only one shareholder, the largest controlling shareholder has less than 100% ownership in only 188 firms.

[35] For a good review of the literature on information asymmetry and the debt–equity choice see Klein, O'Brien, and Peters (2002).

Focusing on variations within the private firm sample also provides a good proxy for information asymmetry. Recall from Section II.A that my definition of private firms encompasses private not quoted firms and public not quoted firms. Since public not quoted firms are more transparent and have to adhere to additional legal regulations, there is less uncertainty about the condition and value of these firms from the perspective of an outsider. Since this difference is the only distinction between private not quoted and public not quoted firms, firm status can be used as a good proxy for the extent of information asymmetry between insiders and outsiders.

If value of control and information asymmetry are important drivers behind the differences between the cost of private and public equity, I would expect that within the subsample of private firms, firms with more dispersed ownership, as proxied by the number of shareholders, and firms that are more transparent, as proxied by whether they are public not quoted, will be more likely to use equity financing and as a result have lower debt ratios.

As noted earlier, the information on both ownership concentration and firm status is static—this information is observed only as of the *last* accounting statement in FAME. In order to study how this information affects financial policy I need to observe financial decisions—capital issuance and retirement—in the *following* period. I therefore complement the FAME DVD version used in this paper (November 2003 release) with the FAME online version (November 2005 release). This additional information allows me to study how the status (private not quoted vs. public not quoted) and ownership (number of shareholders) of private firms in 2002/2003 affected issuance and retirement decisions over the following 2 years.

Table IX presents summary statistics of the subsample of private firms by firm status. It is easy to see that, while smaller in magnitude, the differences observed above in the financial policies between private and public firms hold also in the private firm subsample. In particular, the table shows that public not quoted firms are more likely to issue equity. Conditional on capital issuance as well as conditional on capital retirement, public not quoted firms are more likely to use equity rather than debt. Public not quoted firms also have lower debt ratios, and their debt has longer maturities. As expected, public not quoted firms are larger, regardless of whether measured in terms of total assets or revenues.

While the evidence in Table IX is encouraging, it is important to investigate the role of ownership concentration and information asymmetry on firms' financial policies under the ceteris paribus condition. This task is the topic of the following subsections.

A. The Decision to Issue Equity

If ownership concentration (value of control) and information asymmetry (transparency) are the frictions that make private equity more costly than public equity, then within the subsample of private firms public not quoted firms and firms with more shareholders should be more likely to raise external equity.

Table IX

Private Sample Summary Statistics by Legal Status

This table breaks down the sample of private firms according to their legal status: private not quoted versus public not quoted (for the definitions of the legal statuses see Section II.A). Since the legal status is available only as of the most recent accounting statement, the table includes only the most recent accounting statement for each firm. Equity issue is a binary variable equal to one if the firm issued equity and zero otherwise. Equity versus Debt issue (retirement) is a binary variable equal to one if the firm issued (repurchased) equity and zero if issued (retired) debt in the following period (information about issued capital after the last statement date in the FAME DVD is collected from the FAME online application version Nov/2005). Definitions of the rest of the variables are in the appendix. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level correspondingly.

		Obs	Mean	Median
Equity issues	Private not quoted	26,899	0.066	0.000
	Public not quoted	1,767	0.099	0.000
	Difference		−0.033***	
Equity vs. Debt issues	Private not quoted	5,362	0.142	0.000
	Public not quoted	478	0.209	0.000
	Difference		−0.067***	
Equity vs. Debt retirements	Private not quoted	4,993	0.109	0.000
	Public not quoted	437	0.135	0.000
	Difference		−0.026*	
Number of shareholders	Private not quoted	33,001	2.237	2.000
	Public not quoted	1,774	2.731	2.000
	Difference		−0.494***	0.000***
Leverage	Private not quoted	36,555	0.334	0.273
	Public not quoted	2,160	0.292	0.244
	Difference		0.041***	0.029***
Sht to Tot. Debt	Private not quoted	35,289	0.644	0.747
	Public not quoted	2,100	0.570	0.587
	Difference		0.074***	0.160***
Total assets	Private not quoted	36,707	26,473	6,099
	Public not quoted	2,170	43,935	6,926
	Difference		−17462***	−827***
Turnover (sales)	Private not quoted	37,178	32,603	10,223
	Public not quoted	2,181	48,342	11,899
	Difference		−15739***	−1676***
ROA	Private not quoted	33,075	0.062	0.059
	Public not quoted	2,029	0.045	0.054
	Difference		0.017***	0.005**
CAPEX/total assets	Private not quoted	16,293	0.035	0.020
	Public not quoted	1,506	0.036	0.021
	Difference		−0.001	−0.001
Growth	Private not quoted	34,562	1.064	1.010
	Public not quoted	2,116	1.076	1.010
	Difference		−0.013	0.000
Cash/total assets	Private not quoted	32,956	0.118	0.047
	Public not quoted	2,021	0.112	0.049
	Difference		0.005	−0.001
Age	Private not quoted	37,310	23.686	16.870
	Public not quoted	2,205	22.452	15.414
	Difference		1.233**	1.456***

Table X

Private Firms: Determinants of Financial Decisions

The table presents results from three probit models for the private firms subsample. In the first column the dependent variable is equal to one if the firm issues equity in the following period and zero otherwise (information about issued capital after the last statement date in the FAME DVD is collected from the FAME online application version Nov/2005). The second and third columns model the debt–equity choice. In the second (third) column only firms that issued (repurchased/retired) debt or equity are included. In the second (third) column the dependent variable is equal to one if the firm issued (repurchased) equity and zero if issued (retired) debt. Public not quoted is a dummy variable equal to one if the firm is public not quoted and zero otherwise (i.e., private not quoted). Definitions of the independent variables are in the appendix. Reported in brackets are the heteroskedasticity-consistent t-statistics. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level correspondingly.

	Equity Issuance	D/E Issuance	D/E Repurchase
Public Not Quoted	0.190	0.254	−0.086
	[3.56]***	[1.99]**	[0.69]
Number of shareholders	0.024	0.034	0.077
	[2.91]***	[1.98]**	[4.91]***
ROA	−1.598	−3.016	1.807
	[−14.94]***	[6.82]***	[4.75]***
Growth	0.120		
	[4.35]***		
Tng	−0.104		
	[−1.72]*		
Size	0.085		
	[8.36]***		
Sht to Tot. Debt	−0.124		
	[−2.98]***		
Log Age	−0.134		
	[−8.55]***		
TMA Leverage		−1.151	1.011
		[6.09]***	[4.37]***
Pseudo-R^2	0.0513	0.101	0.045
Observations	23,125	2,502	2,367

To test this hypothesis I present the results of a probit model for the decision to issue equity in the first column of Table X.

Three important points emerge from these results. First, all of the coefficients on the control variables have the expected signs. Firms that are more profitable are less likely to raise equity, because firms' debt ratios decrease with internal generation of equity, causing more profitable firms to rebalance their capital structure by raising debt when raising additional capital. Firms with larger growth opportunities, as proxied by sales growth, are more likely to raise external equity to finance their future investments. Firms whose assets are more tangible are less likely to raise equity. Younger firms and larger firms are more likely to raise equity, possibly because younger firms have greater growth opportunities and larger firms are more transparent.

Second, the coefficient on the number of shareholders is positive and highly statistically significant. This result reinforces the idea that the desire to

maintain control over the firm is an important determinant of the decision to raise equity. When a firm has more shareholders and its ownership is more dispersed, the probability that it will raise equity is higher.

Third, the coefficient on the public not quoted dummy is also positive and highly statistically significant. This result reinforces the relevance of information asymmetry for a firm's financial policy. Public not quoted firms, which are more transparent and have to adhere to more regulatory requirements than private not quoted firms, are more likely to raise equity. While information asymmetry has adverse consequences for the valuation of any risky asset, it has more adverse consequences for the more junior security in the capital structure—equity. As a result, firms with larger information asymmetry, that is, private not quoted firms, are less likely to raise equity.

Another way to examine whether ownership concentration and information asymmetry play an important role in determining the attractiveness of equity financing is by studying the decision firms make when they face the debt–equity choice. The results are presented in the second and third columns of Table X.

I model the debt–equity choice within the subsample of private firms in the same way as in Section III.D. Consistent with the results in Table VIII, private firms behave in accordance with the target adjustment hypothesis of the trade-off theory. That is, the smaller the firm's actual leverage relative to its target and the higher the firm's profitability, the more likely the firm is to increase its leverage by choosing debt in the issuance decision and equity in the repurchase decision.

More importantly, the results show that information asymmetry and ownership concentration are important determinants of firms' financial policies. When raising capital, public not quoted firms are more likely than private not quoted firms to choose equity financing. In both the issuance and retirement decisions, firms with more dispersed ownership, as measured by the number of shareholders, are more likely to rely on equity financing.

B. Determinants of Leverage

In this section, I use the same framework as in Section III.A to examine whether ownership concentration and information asymmetry determine firms' debt ratios. The results are presented in Table XI.

As expected, the coefficients on the control variables are in line with those presented in Section III.A. In particular, leverage increases with size, asset tangibility, and sales growth, and decreases with profitability, debt maturity, and firm age.

More important are the signs of the coefficients on the public not quoted dummy and the number of shareholders. First, the coefficient on the public not quoted dummy is negatively statistically significant despite the much smaller sample. This result suggests that information asymmetry is at least one of the reasons that private firms are less likely to rely on equity financing. As outsiders know less about the firm, the value of the more junior security in the

Table XI
Private Firms: Determinants of Leverage

All coefficient estimates are from a cross-sectional regression for leverage for the subsample of private firms only. The dependent variable is leverage. Public not quoted is a dummy equal to one if the firm is public not quoted and zero otherwise (i.e., private not quoted). Definitions of the rest of the variables are in the appendix. Independent variables are lagged one period. The regressions include also a constant, year dummies, and two-digit SIC code dummies (not reported). Reported in brackets are the heteroskedasticity-consistent t-statistics. *** denotes statistical significance at the 1% level.

	I	II	III
Public Not Quoted	−0.019	−0.018	−0.023
	[2.86]***	[2.70]***	[3.49]***
Number of shareholders	−0.01	−0.01	−0.008
	[11.40]***	[10.99]***	[8.49]***
ROA	−0.55	−0.553	−0.562
	[22.70]***	[22.05]***	[22.35]***
Growth	0.051	0.048	0.030
	[7.14]***	[6.52]***	[4.21]***
CPX	−0.012	0.014	−0.004
	[0.77]	[0.54]	[0.17]
Tng	0.188	0.186	0.215
	[17.19]***	[15.61]***	[18.27]***
Size	0.023	0.024	0.024
	[11.36]***	[11.34]***	[11.84]***
Sht to Tot. Debt		0.051	0.061
		[7.17]***	[8.74]***
Log Age			−0.058
			[21.95]***
Observations	12,778	12,271	12,264
R^2	0.19	0.19	0.220

capital structure, equity, is more adversely affected and as a result the firm turns to debt financing.

Second, the coefficient on the number of shareholders is also statistically negatively significant. As the number of shareholders decreases and ownership is more concentrated, the firm has more debt in its capital structure. Consistent with the results in the previous section, this result suggests that the desire to maintain control over the firm drives the incumbent to avoid raising external equity, and as a result the firm takes on more debt when external capital is required.

In summary, this section shows that information asymmetry and ownership concentration are important determinants of private firms' financial policies. Since private firms are generally much less transparent than public firms, and their ownership is much more concentrated than that of public firms, these results also strongly suggest that value of control and transparency can help explain the differences documented in Section III in the financial policies between private and public firms.

Table XII
Operating Performance and the Funding of the Firm

The table reports coefficient estimates from pooled OLS panel regressions with heteroskedasticity-consistent *t*-statistics, corrected for correlation across observations of a given firm, reported in brackets. The dependent variable is changes in the variable at the top of each column. Definitions of the variables are in the appendix. Cash, CAPEX, and Div, are normalized by the total assets. The regressions include also lagged changes in capital expenditures, turnover growth, asset tangibility, log size, log age, short-to-long term debt, and year dummies (not reported). Observations in which a firm goes private or goes public are excluded. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level correspondingly.

	Leverage	Net Leverage	Cash	CAPEX	Div
Panel A					
Priv ΔROA_t	−0.368	−0.481	0.119	−0.055	0.075
	[43.42]***	[46.30]***	[20.02]***	[5.67]***	[13.88]***
Pub ΔROA_t	−0.2	−0.205	0.011	0.02	0.023
	[9.39]***	[7.50]***	[0.64]	[1.65]*	[4.23]***
Priv ΔROA_{t-1}	−0.166	−0.191	0.025	0.063	0.012
	[20.61]***	[19.22]***	[4.61]***	[8.84]***	[3.44]***
Pub ΔROA_{t-1}	−0.041	−0.021	−0.011	0.083	0.003
	[2.32]**	[0.96]	[0.71]	[6.47]***	[0.76]
Observations	63,658	58,706	58,945	55,657	63,691
R^2	0.12	0.12	0.02	0.23	0.02
Panel B					
ΔROA_t	0.000***	0.000***	0.000***	0.000***	0.000***
ΔROA_{t-1}	0.000***	0.000***	0.029**	0.176	0.083*

V. Access to Capital and the Funding of the Firm

Given the evidence presented so far, it is natural to ask how private firms' relatively more constrained financial policy affects other aspects of firm funding. If a firm visits the capital markets rarely, it will probably stockpile more cash and be more constrained in financing its investments. In this section I address this question by asking whether private firms alter their investments, cash holdings, or external borrowing in response to changes in their operating performance relative to their public counterparts.

In Table XII I report results of OLS regressions of the *changes* of each of the following variables: total debt, net debt, cash, capital expenditures, and dividends. The independent variables of interest are changes in contemporaneous and lagged profitability. As controls I include lagged changes in capital expenditure, sales growth, asset tangibility, log size, log age, the ratio of short- to long-term debt, and year dummies (not reported).[36] I exclude firm-year observations in which a firm went public or private in order to ensure that the results

[36] I also estimate alternative reduced-form models, which include a different list of regressors, and the results remain qualitatively the same.

are not affected by one-time changes that occur when a firm changes its status. This approach allows me to determine how *changes* in current and previous operating performance affect *changes* in various financial and investment aspects of the firm.

The results in Table XII reveal the importance of access to capital. First, as shown above, private firms' debt ratios are much more sensitive to firm performance, consistent with the fact that these firms have fewer opportunities to change their leverage through interactions with the external capital markets.

Second, since private firms rely on internal capital generation, and are affected by internal capital dilution, more than public firms, their cash holdings are much more sensitive to performance than are the cash holdings of public firms. This result is consistent with the notion that if a firm visits the capital markets only rarely, it will stockpile more cash in good times and will dilute its cash holdings faster in bad times. In fact, while private firms increase their cash holdings when their current and lagged performance improves, the relationship between public firms' cash holdings and performance is transient: Public firms initially increase their cash holdings with an increase in profitability, but in the following period they decrease their cash holdings by virtually the same amount.

Third, the results for capital expenditures reveal how important access to capital is not only for financial policy but also for real investment decisions. While public firms are able to utilize their increased profitability for the purposes of increasing their investments immediately, private firms' investments initially *decrease* with a contemporaneous increase in their profitability. Only in the following period do private firms increase their investments in response to an increase in their performance. This result is complementary to the results with respect to cash holdings. Since public firms can smooth their activities and invest when appropriate, they do not stockpile cash in response to an improvement in performance; rather, they immediately use the increased cash to increase their investments. In contrast, private firms stockpile cash when they have an opportunity to do so, and as a result they do not increase their investments right away. It is worth noting that it is not surprising that private firms' coefficient on contemporaneous ROA is negative, as opposed to insignificantly different from zero. When ROA increases, the firm's size increases as well. As a result, if private firms keep the level of their capital expenditures fixed, their capital expenditures as a percentage of firm size will decrease.

Finally, dividend policy is also intimately related to the ability of firms to access the capital markets. Consistent with the dividend smoothing documented in the academic literature (Lintner (1956), Baker, Farrely, and Edelman (1985)), I find that public firms do not change their dividends much in response to changes in firm performance. On the other hand, private firms' decision to distribute dividends is strongly related to their ability to do so. Why firms smooth dividends in well-functioning capital markets has puzzled financial economists. Theoretical models that explain this phenomenon rely on information asymmetry between firm insiders and outsiders (e.g., John and Williams (1985), Kumar (1988)). Since such information asymmetry does not exist in the context of

privately held firms, it is not surprising that private firms' dividends policy is much more sensitive to their operating performance.

VI. Conclusions

Using a database of virtually all firms in the United Kingdom, I examine the financial policies of both public and private firms. First, I show that firms' access to the public equity capital markets has two effects for capital structure and financial policy. The first is a level effect whereby, relative to public firms, private firms rely less on equity financing and as a result have higher debt ratios. The second is a sensitivity effect whereby, relative to public firms, private firms are less likely to visit the external capital markets. As a result, private firms' debt ratios exhibit greater persistence, higher sensitivity to profitability, and lower sensitivity to determinants of target debt ratios, such as proxies for growth opportunities.

Next, I seek to identify the market frictions that make private equity more costly than public equity, and that therefore lead to the apparently striking differences between public and private firms' financial policies. Limiting this analysis to the subsample of private firms due to data restrictions, I show that the larger the desire to retain control over the firm, and the larger the information asymmetry between firm insiders and outsiders, the larger is the reluctance of the firm to visit the external equity capital markets. Specifically, among the private firms, firms with more dispersed ownership, as proxied by the number of shareholders in the firm, and firms that are more transparent, as proxied by whether they are legally allowed to issue securities to the public, are more likely to rely on equity financing and have lower debt ratios.

Finally, I show that access to the public capital markets has a major effect on other aspects of the firm's funding and investments. As private firms rely more exclusively on internal capital generation, their cash holdings are much more sensitive to their performance. Further, while public firms increase their investments in response to an increase in profitability, private firms stockpile cash when they have the opportunity to do so and as a result they do not increase their investments concurrent with an increase in performance—they do so only with a lag. Finally, while public firms exhibit dividend smoothing behavior, in which dividend payouts do not change much in response to changes in firm profitability, private firms' decision to distribute dividends is strongly related to firm performance.

The results of this paper have cross-sectional implications across countries. The differences we observe in the United Kingdom between public and private firms suggest that in countries in which the stock market does not provide enough liquidity, underwriters do not provide certification, and minority rights are not protected, value of control and information asymmetry will be larger and as a result the financial policy of public firms will be similar to the financial policy of private firms documented in this paper. Specifically, relative to public companies in developed stock markets such as those in the U.S. and the U.K., public firms in underdeveloped stock markets will rely less on equity capital,

will have higher debt ratios, and will visit the capital markets less frequently. In addition, their leverage will be more sensitive to operational performance and exhibit greater persistence. Such a cross-country comparison may be a fruitful avenue for future research.

Appendix

This Appendix provides the definitions of the variables used throughout the paper.

Leverage = [(short debt + long liabilities)/total assets].

Short to Long = short debt/(short debt + long liabilities).

Net Leverage = [(short debt + long liabilities-cash)/total assets].

$ROA_t = EBIT_t/((\text{total assets}_t + \text{total assets}_{t-1})/2)$.

Cash is cash and equivalents.

$Growth_t = turnover_t/turnover_{t-1}$.

Age is in years, and Log Age is the natural log of age.

Div Payer is equal to one if the firm has a positive dividend and zero otherwise.

Div to EBIT = dividend/EBIT, is calculated only for observations in which EBIT is positive.

Currency variables are in thousands of 2003 GBP.

Public is a dummy equal to one if the firm is public and zero if private.

CPX = CAPEX/total assets.

Tng = (tangible assets + investments)/total assets.

Size is the natural log of total assets.

Net working capital = (work in progress + trade debtors + other current assets − trade creditors)/total assets.

TMA Leverage is the target debt ratio minus actual debt ratio at beginning of period.

TMA Debt is target minus actual debt normalized by total assets.

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