Government Ownership and the Cost of Debt: Evidence from Government Investments in Publicly Traded Firms

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We investigate the impact of government share ownership on the cost of corporate debt. Government ownership might carry an implicit debt guarantee that reduces the chance of default and, hence, leads to a lower cost of debt. On the other hand, government ownership could lead to a higher cost of debt if this implicit debt guarantee increases moral hazard for managers and if state owners impose social and political goals that reduce corporate profitability and thus increase default risk. Using a sample of 1,279 bonds issued by 215 firms subject to changes in government share ownership from 43 countries over 1990-2010, we find that government ownership is associated with lower spreads during the 2008-2010 financial crisis, during various banking crises, for highly-levered firms, and for non-investment grade bonds. That is, in times of economic recession or firm distress, the dominant effect is the reduction in perceived default risk. Further, we find that the effect is specific to domestic government ownership, also consistent with the notion that the main channel of impact is the debt guarantee, and we document that the impact of government ownership differs by type of government entity. Outside of crises, government ownership generally leads to a higher cost of debt.

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Abstract

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Contrary to public perceptions and despite the worldwide success of state privatizations, over the past decade governments have acquired more assets through stock purchases (US$ 969 billion) than they have sold through share issue privatizations and direct sales (US$ 765 billion).[1] In fact, governments and state-owned entities have been such active stock-market investors that they now own approximately one-fifth of global stock-market capitalization (Economist, 2010). We investigate the impact of this novel and growing form of government ownership on the cost of publicly traded debt of the firms in which governments invest.

The rise in "state capitalism" that this phenomenon of government stock purchases both reflects and encompasses has been deeply controversial, especially when it involves share purchases by foreign state-owned investors such as sovereign wealth funds (SWFs) (Bortolotti, Fotak, and Megginson, 2010; Dewenter, Han, and Malatesta, 2010; Kotter and Lel, 2009) or state-owned enterprises (SOEs) (Karolyi and Liao, 2010; Karolyi and Taboada, 2011). The mass of published research examining the effectiveness of governments versus private investors as owners of business enterprises points to the superiority of the latter, and empirical evidence overwhelmingly documents that when governments privatize SOEs, performance tends to improve – often dramatically.[2] All this suggests that states should be reducing their ownership of corporate equity, rather than increasing it. Yet, this evidence is mostly based on an analysis of operating performance or of equity prices. The impact of government ownership on the value of firm debt is largely unexplored.[3]

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[1] The January 2011 version of the SDC Platinum database contains approximately 5,900 government divestments worth US$ 1.3 trillion and about 4,100 government investments worth approximately US$ 1.2 trillion, but since 2000 the database records US$ 725 billion in divestments and US$ 969 billion in investments. The trend is even more apparent after 2007 – since May 2007, governments have sold US$ 157 billion of assets but purchased US$ 470 billion.

[2] The relative effectiveness of state versus private ownership is examined in Eckel and Vermaelen (1986), Boardman and Vining (1989), Kole and Mulherin (1997), Shleifer (1998), Chhibber and Majumdar (1999), Shirley and Walsh (2000), LaPorta, López-de-Silanes, and Shleifer (2001), Sapienza (2004), Dinç (2005), Caprio, Laeven, and Levine (2007), Chen, Firth, Xin, and Xu (2008), Chernykh (2008), Lin and Su (2008), Wolf (2009), Firth, Lin, and Zou (2010), Morck, Yavuz, and Yeung (2011), and Lin, Ma, Malatesta, and Yuan (2011). Early privatization empirical studies are summarized in Megginson and Netter (2001) and Djankov and Murrell (2002), while more recent research includes Sun and Tong (2003), Megginson, Nash, Netter, and Poulsen (2004), Boubakri, Cosset, and Guedhami (2005), D'Souza, Megginson, and Nash (2005), Gupta (2005), Brown, Earle, Telegdy (2006, 2010), Wolf and Pollitt (2008), Estrin, Hanousek, Kočenda, and Svejnar (2009), Boubakri, Cosset, Guedhami, and Saffar (2011), and Denisova, Eller, Frye, and Zhuravskaya (2011).

[3] Borisova and Megginson (2011) offer a recent exception, as they investigate the closely related impact of privatizations on the firms' cost of debt.

Despite governments in some ways resembling other large institutional investors, they often have different goals. While private investors are generally concerned with wealth maximization, several possible rationales for state ownership of listed equity have been put forth. Governments might purchase equity stakes to influence companies to pursue socially-desirable objectives, such as maintaining high levels of employment, or to subsidize industries considered vital to the nation's political and military goals. These motivations suggest that governments are reluctant to allow a company in which they purchase stock to fail. Accordingly, investors come to expect that governments will likely honor the debt obligations of struggling government-owned firms, thus providing a sort of implicit debt guarantee (Faccio, Masulis, and McConnell, 2006; Brown and Dinç, 2011; Borisova and Megginson, 2011). Such a debt guarantee is likely to lower the perceived risk of default, leading to investors requiring lower risk premiums and, hence, to a lower cost of debt for the issuing firm.

On the other side, Stiglitz, Jaramillo-Vallejo, and Park (1993) warn that this reluctance of governments to allow firms (especially financial institutions) to fail is likely to increase managerial moral hazard, as shareholders and managers enjoy the benefits of strong firm performance, while the government and, ultimately, the taxpayers share the costs of insolvency. Such moral hazard is further strengthened by a lower risk of a manager losing his/her job, as government-owned firms are less likely to be acquired in a takeover or be allowed to go bankrupt. This moral hazard problem is also exacerbated by a monitoring gap which is likely to be associated with government ownership, as shown, for example, by Bortolotti, Fotak, and Megginson (2010) for SWF investments--governments typically provide lower levels of monitoring than other private shareholders and the implicit guarantees they offer remove monitoring incentives for other stakeholders. In addition, government ownership might lead to the imposition of social and political priorities on investment targets, which could result in deviations from purely economic shareholder value maximization. Such deviations are likely to negatively impact firm performance and firm value, which in turn will lead to a higher probability of default and a higher cost of debt. In other words, the implicit debt guarantee has a direct effect on the cost of debt – by lowering the perceived risk of default, it lowers the required risk premium – but it also has an indirect effect of increasing moral hazard and agency costs, which could lead to a higher risk of default.

The net impact of government ownership on the cost of debt of a firm is thus a matter for empirical investigation. Our analysis aims to determine which of these effects dominates. Accordingly, we examine the link between government ownership and spreads (above benchmark yields) on publicly traded corporate bonds issued by firms in which governments and other state-owned investors purchase an ownership stake. Our sample consists of 1,279 bonds issued by 215 publicly traded companies from 43

countries over 1990-2010.[5] The correct measure of government ownership is crucial to our analysis and we manually collect stock ownership for all bond issuers in our sample for each year between 1990 and 2010. Our main analysis relies on panel regressions in which we model the spread on corporate bonds as a function of government ownership after controlling for other factors (both security- and firm-specific) which have been found in previous research to affect the cost of debt. We note that a government guarantee on the debt of investment targets is likely to be more valuable during times of economic hardship as defaults are, all else equal, more likely during crises or recessions (Ivashina and Scharfstein, 2010; Puri, Rocholl, and Steffen, 2011; Santos, 2011). Accordingly, we distinguish between the recent financial crisis and previous 'non-crisis' years. During non-crisis years, we find that firms with one or more government entities as a shareholder display significantly higher spreads, by 52 basis points (bp), on their bonds. During the recent financial crisis, however, government presence is associated with lower spreads, by 24 bp, and each percentage point increase in government stake ownership translates into a 1 bp decrease in the cost of debt. In robustness tests, we use an alternative metric of country-level distress constructed by Laeven and Valencia (2010), which identifies banking-sector distress over the period 1970-2010 around the globe. Using this alternative proxy, we still find government ownership is associated with a significantly higher cost of debt (39 bp) during non-crisis years and a lower cost of debt (15 bp) during crisis years.

Past research has also documented that not all institutional investors are good monitors and that the monitoring is mostly – perhaps uniquely – provided by independent, long-term investors (Borokhovich, Brunarski, Harman, and Parrino, 2006; Chen, Harford, and Li, 2007; Ferreira and Matos, 2008; Brav, Jiang, Partnoy, and Thomas, 2008; Cronqvist and Fahlenbrach (2009); Klein and Zur (2009; Aggarwal, Erel, Ferreira, and Matos, 2011); Chung and Zhang, 2011). Similarly, different government-owned entities vary in terms of objectives and *modus operandi*. For example, government entities such as SOEs are likely to be more closely involved in the management of investment targets than are pure state actors, such as the central government or local/regional governments (Sapienza, 2004; Dinç, 2005; Brown and Dinç, 2005; Fan, Wong, and Zhang, 2007). State-owned investment vehicles such as pension funds and SWFs likely monitor target firm management differently than do pure government entities or state-owned operating companies (Woidtke, 2002; Giannetti and Laeven, 2009; Bortolotti, Fotak, and Megginson, 2010; Jiang, Lee, and Yue, 2010). An activist stance by acquiring state entities could, therefore, either mitigate or amplify the adverse impact of government-induced moral hazard depending on the goals of the government entity. We find that the increase in cost of debt during non-crisis years is driven by the presence of local governments, SOEs with a mix of public and private ownership, government-owned financial institutions, and pension funds. However, during the crisis, local

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[5] Our focus on debt issued by publicly traded firms is driven by data availability constraints.

government and mixed SOE ownership helps lower the cost of debt in target firms. When focusing on the size of the stake owned, we find that large stakes held by SWFs and other government-owned financial institutions increase the cost of debt in non-crisis years. In the crisis period, larger holdings by central governments and by mixed SOEs lead to a lower cost of debt. Overall, our evidence is consistent with the idea that direct government involvement – whether central or regional – provides the strongest implicit debt guarantees, due to political goals (often inconsistent with firm default) and 'deep pockets', thereby helping lower the cost of debt during crisis periods. Conversely, the increase in the cost of debt is primarily linked to financial arms of the government (e.g., SWFs, pension funds), whose investing objectives are often commercial and, as such, do not lead to a similar implied debt guarantee.

We further note that implicit government guarantees are likely to be strongest for domestic targets, as the default of a foreign investment target is less likely to carry the political stigma associated with domestic failures of state-owned companies. For example, social and political goals are less likely to be imposed on foreign targets, as employment maximization is unlikely to be a goal sought by a foreign-government owner. Additionally, recent empirical studies show that local investors are better able to overcome informational asymmetries than are more distant investors (Baik, Kang, and Kim, 2010; Almazan, de Motta, Titman, and Uysal, 2010). On the other hand, even more empirical evidence points to the superiority of foreign institutional and corporate investors as monitors of investee-firm management, which could lead to higher firm valuations and thus a reduced cost of debt (Djankov and Murrell, 2002; Brown, Earle, and Telegdy, 2006 and 2010; Ferreira and Matos, 2008). Clearly, we should expect different types of government entities to impact the cost of debt of investee firms in materially different ways. Accordingly, by separately analyzing the impact of domestic and foreign government ownership, we find that the implicit debt guarantee documented during the recent financial crisis is specific to domestic government presence. Foreign government ownership, however, is associated with an increase in the cost of debt during the non-crisis years, equal to about 1 bp for each percentage point of stake owned.

We note that government guarantees might be more valuable the more likely the firm is to default. Therefore, we have allowed for a different impact of government ownership on the cost of corporate debt during financial and banking crises (with the implicit assumption that firm default risk increases during times of economic hardship), showing that the value of a government debt guarantee is greater during times of economy-wide distress. In additional analysis, we focus on a firm-specific measure of distress, by investigating the impact of government ownership on the cost of debt for a sample of firms issuing high-risk (non-investment grade) bonds. In this sample of non-investment grade bonds we observe patterns similar to our main results – domestic (foreign) government ownership during crisis (non-crisis) years is associated with a lower (higher) cost of debt. The effects we document are strong.

For non-investment grade bonds, domestic government presence leads to a significant discount of 72 bp over the entire sample and of 133 bp during the crisis years. Foreign government presence, on the other hand, is associated with significant increases in the cost of debt of 143 bp over crisis years and 209 bp over non-crisis years.

On balance, these results suggest that private investors believe that stock ownership by most domestic government categories can improve the creditworthiness of corporate bond issuers by providing an implicit bond payment guarantee that becomes especially valuable during a financial crisis. Evidence on the impact of the cost of debt of government ownership has been investigated recently by Borisova and Megginson (2011). Our research differs from their analysis in several ways, most importantly in that they examine privatizations – the reduction of state control in firms – while we look at the government as an investor. Our analysis further indicates that the relationship between government ownership and cost of corporate debt is dramatically affected by firm-specific and economy-wide distress, differences between types of government acquirers and, finally, by the distinction between domestic and foreign government ownership. Our final sample spans 43 countries, and includes firms from North America and Asia, while Borisova and Megginson (2011) focus solely on domestic government ownership of European firms.

This study is structured as follows. Section 1 develops the hypotheses. Section 2 describes data sources, sample construction, and variable definitions and offers descriptive statistics and univariate tests. Section 3 discusses the methodology, panel regressions, and the associated model estimation results. Section 4 focuses on robustness tests, while Section 5 concludes.

1.   Hypothesis Development

Governments, as acquirers, differ from private entities in multiple ways. Most importantly, government ownership carries an implicit – and, sometimes, explicit – guarantee on the debt of the firm, as it is unlikely that a firm with state ownership will be allowed to default on its debt. This unwillingness of governments to allow firms to default is due to three main reasons. First of all, there are political goals, such as low unemployment, which are not consistent with the loss of jobs frequently associated with the default of a firm. Second, government ownership is often motivated by the desire to maintain key industries providing crucial services to the country; accordingly, governments are not keen on allowing such strategic holdings to default. Finally, politicians do not wish to be associated with a failed investment and will thus pressure or steer the government to rescue an insolvent government-owned firm. Consistent with this reasoning, Faccio, Masulis, and McConnell (2006) find that politically connected firms are more likely to be recipients of government bailouts, while Brown and Dinç (2005) show evidence that defaults of government-owned banks are less common than defaults of privately-owned banks. Consequently, debt holders likely perceive a reduced probability of default as governments will

back the debt of the firm. Since government guarantees extend directly to the debt of the firm, we might expect that state ownership would lower the debt pricing for target firms.

However, Borisova and Megginson (2011) show that state influence on debt pricing can be non-monotonic, and several factors resulting from state presence could raise the firms' cost of debt financing. First, as discussed by Stiglitz, Jaramillo-Vallejo, and Park (1993), the implicit government guarantee allows shareholders and managers to benefit from strong firm performance, while public funds are used to keep firms afloat during difficult periods. Consequently, we expect managers to increase levels of risk taking, which in turn is likely to increase the cost of debt of the government-owned firm.

Second, the moral hazard problem might be reinforced by a monitoring gap that occurs because the government is unable, or unwilling, to supervise management. Since debtholders expect governments to rescue distressed firms, their own incentives to monitor the actions of management decrease (OECD, 1998). Further, government employees might simply not have the skills or technical knowledge necessary for proper monitoring, due to either political appointments or other inefficiencies in the government employment sector. Borisova, Brockman, Salas, and Zagorchev (2012) find a lower quality of corporate governance in publicly traded firms partially owned by the government when compared to firms free from state ownership. Governments might be reluctant to actively impact the governance of firms in which they invest for fear of public opposition and backlash by media and regulators, especially if the investment target is located abroad. Bortolotti, Fotak, and Megginson (2010) accordingly propose the "Constrained Foreign Government Investor Hypothesis" and show evidence that SWFs create a 'governance gap' that leads to value destruction, largely due to their desire not to stir opposition. Eckel and Vermaelen (1986) also point to the fact that government ownership might decrease the probability of a takeover, hence reducing the disciplining effect associated with the threat of a takeover.

Third, government investment vehicles might be affected by political pressures, thus leading them to pursue goals other than wealth maximization. State entities might want to maximize employment, favor domestic investments, acquire foreign technologies and, as Shleifer (1998) suggests, pursue political goals and increase government officials' personal income. Kahan and Rock (2010) discuss how, despite nominal fiduciary duties, governments can impose their own goals on a firm more easily than private controlling shareholders. Well-known cases of government ownership directing the benefits to their political supporters or simply appeasing the groups that have power to overthrow the existing government highlight inefficiencies in state ownership.[6] All of these factors are likely to lower the risk-adjusted

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[6] Refer to Shleifer (1998) for examples. Some instances include post World War II British government sponsoring of coal mines due to the miner union power to overthrow current government and the Philippines running a state-owned power utility that shuts off electricity seven days a week.

performance of government-owned firms, and as Crabbe and Fabozzi (2002) document, firm profitability is closely linked to the firm's ability to repay borrowed funds.

Between implicit debt guarantees and the moral hazard and political goals linked to state owners, the net impact of government ownership on the cost of debt of target firms is a matter of empirical investigation. We simply hypothesize that government ownership does have an impact on the cost of debt of investment targets, positing:

H1: Government ownership impacts the cost of debt of investment targets.

We test the above hypothesis by investigating whether the cost of debt of firms with government entities amongst their shareholders is different from the cost of debt of a sample containing the same firms during years without government ownership. We also note that the impact that government ownership has on firm behavior could plausibly be conditioned by the size of the government owned stake. Governments might be more protective of firms in which they own larger stakes, thus reinforcing the implicit debt guarantee previously mentioned, or, similarly, state owners may have a stronger impact on the governance and behavior of firms in which they hold larger stakes. Accordingly, in subsequent analysis, we examine the relationship between firms' cost of debt and the size of the stake owned by government investors. The value of a debt guarantee, implicit or clearly stated, increases in the likelihood of distress or bankruptcy of the borrower. Therefore, if government ownership provides a debt guarantee, its value would increase in times of distress. Hence, we hypothesize that:

H2: The impact of government ownership on the cost of debt of investment targets differs during recessions and periods of market-wide financial distress.

As a first test of the above hypothesis, we make use of the recent financial crisis (spanning the years 2008, 2009, and 2010). This event, engulfing as it has virtually the entire global economy, is an appropriate testing ground as it constitutes an exogenous shock in most domestic economies. Using both interaction variables and data subsets, we investigate whether the impact of government ownership on the cost of firms' debt differs during the recent financial crisis. For robustness, we replicate our analysis by focusing on a broader set of financial crises – the banking crises described by Laeven and Valencia (2010).

Using similar reasoning regarding the importance of an implicit government guarantee during times of overall market distress, we investigate whether this guarantee would also be more valuable in the presence of firm-specific distress when access to capital markets is constrained and defaults are more likely. We thus examine the influence of government ownership on the cost of high yield bonds and highly-levered firms, which we use as proxies for firm-specific distress, and theorize the following:

H3: The impact of government ownership on the cost of debt of investment targets differs during periods of firm-specific distress.

Past research has documented that not all institutional investors are good monitors and that the best monitoring is provided by independent, long-term investors (Chen, Harford, and Li, 2007). Government-owned entities similarly differ in terms of objectives and *modus operandi*. Some classes of government entities are more likely to be closely involved in the management and monitoring of their acquisition targets. An activist stance by the acquiring entities could mitigate the adverse impact of government-induced moral hazard. Similarly, the strength of the implicit debt guarantee differs according to the nature of the government entity holding the investment stake, in turn leading to different impacts on the cost of debt.

H4: The impact of government ownership on the cost of debt of investment targets differs according to the type of government investment vehicle.

Accordingly, we investigate whether different classes of government-owned acquirers (central government, local government, SWFs, SOEs, mixed SOEs, public pension funds, and government financial institutions) have different impacts on the cost of debt of investment targets.[7] In particular, we expect government acquirers that are more closely associated with the political goals of government (such as central governments) to take on the role of 'protectors' and to provide the strongest debt guarantees. Entities with a more independent nature (such as government-owned pension funds and SWFs) should more closely follow the behavior of other institutional investors. They are less likely to suffer from the political distortions that lead to government support of distressed firms and less able to rescue defaulting portfolio holdings.

Government guarantees should be strongest for domestic targets, as the default of a foreign investment target is less likely to carry the political stigma associated with domestic failures of state-owned companies. Also, active involvement of a foreign government in a domestic target can and usually is met with significant public opposition, so governments may sometimes choose to be passive investors, especially in their foreign holdings. This reduced monitoring can lead to increased risk taking, reduced firm efficiency and, therefore, a higher cost of debt. This analysis suggests a lower cost of debt for domestic investments due to greater debt guarantees and the reduced monitoring role of foreign governments. On the other hand, government involvement could lead to the higher cost of debt for domestic entities as those investments typically pursue not only shareholder value maximization, but also

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[7] The classification is based on the identity of the government-owned shareholder (the investor). The 'central government' group is comprised by non-independent branches of the central (national) government, such as ministries (most often, ministries of finance) and national treasuries. 'Local/regional government' refers to non-independent branches of sub-national governments (most often, municipalities and townships). 'Pension funds' refers to government-owned pension funds, while for 'Sovereign Wealth Funds' we follow the descriptions given by Thomson ONE Banker and the SWF Institute. 'Government financial institutions' includes financial institutions owned by governments and consists primarily of central and development banks. The 'full SOE' category includes all enterprises fully owned by the government, while 'mixed SOE' includes all enterprises in which the government retains partial ownership or some level of control (for example, through 'golden shares').

other political and social goals. Bortolotti, Fotak, and Megginson (2010) document that social and political goals are less likely to be imposed on foreign targets, as foreign acquisitions tend to be largely driven by economic rationale. Thus, we hypothesize:

H5: The impact of government ownership on the cost of debt of investment targets will differ for domestic firms.

2. Sample Description

We collect a sample of government investments from the Securities Data Company (SDC) Platinum Mergers and Acquisitions database. As an initial screen, we include all investments by entities whose ultimate parent is flagged as 'government' over the years 1980-2010 – that is, investments by governments, government agencies and firms which are, directly or indirectly, majority-owned by governments. This initial search yields a total of 2,517 completed government investment transactions involving 1,953 unique target firms. We further rely on SDC to collect additional information about the deals, such as announcement and completion dates, the proportion of shares acquired for each deal, the proportion of shares held by the acquirer after the deal, the nation of the acquirer, and the nation and primary SIC code of the target. This sample is restricted to government investments in publicly traded firms, so that we can obtain audited accounting data for the investment targets.

We use the SDC New Issues database to identify target firms based on CUSIP identifiers with publicly traded 'plain vanilla' bonds outstanding over the period 1990-2010.[8] Following Borisova and Megginson (2011), we only use straight bonds with fixed coupons as the spreads of debt securities with additional features are more sensitive to sovereign bond yield fluctuations (Duffee, 1998). Based on the 1,953 unique CUSIPs from our government investment sample, SDC returns 7,804 straight bonds from 388 issuers. The retrieval of bond spread and rating data requires bond ISINs, and SDC provides ISINs for 2,977 bonds. Of the remaining bonds without identifiers, we record ISINs for 945 additional securities manually found in Datastream, yielding a combined total of 3,922 bonds.

Data for these bonds are obtained from Datastream. We retrieve the bond spread as the difference between the yield of the corporate bond and the yield of a benchmark government bond that is matched by currency and maturity (using linear interpolation), as defined by Datastream. We also use this database to retrieve time-varying Standard and Poor's (S&P) ratings for the bond issues. Bond yield data and historical credit ratings are recorded as of the Wednesday closer to November 15 of each year (i.e., the third Wednesday of each November). We use data as of Wednesday to avoid end-of-week or beginning-

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[8] Our bond data period begins in 1990 since bond credit spreads are generally unavailable before this time. We recognize government investments starting in 1980 as these data are available and allow us to find a greater sample of firms where the state is present and for which we can subsequently find bond data.

of-week distortions in market data. For similar reasons, we use a target date of November 15 to avoid end-of-year effects. We retrieve 10,124 bond-year spreads for our sample, and 6,854 of these (from 1,554 bonds and 278 firms) are found with accompanying yearly S&P ratings. To eliminate outliers in the credit spread data, we truncate the top and bottom 1% of spreads. It is worth noting that our use of a November sampling point means that spread observations for 2008 are all after the collapse of Lehman Brothers on September 14, and thus after the 2008 financial crisis truly began.

Crucial to our analysis are accurate, time-varying values of government ownership, both in the aggregate and for various categories of state investing entities. Therefore, we further augment our dataset by using numerous sources to verify and track government ownership over time in the targets. For each of our target firms, we manually collect ownership for each year between 1990 and 2010. SDC provides the starting point for this collection via the investments that form our sample, as well as sales by the same acquirer-target pair in order to capture decreases in stakes. We then locate our sample firms in the Thomson ONE Banker ownership module, track holdings of all institutional shareholders across our sample period as of the end of the calendar year, and classify each reported shareholder into various government investing categories (or as non-government investors). When not available in this database, ownership amounts and investor identifications are found using company annual reports, filings, and business descriptions. These data are provided by Thomson ONE Banker; entities' websites; press releases; the Securities and Exchange Commission's Electronic Data-Gathering, Analysis, and Retrieval system (EDGAR); the Canadian Securities Administrators' System for Electronic Document Analysis and Retrieval (SEDAR); Privatization Barometer; the World Bank privatization database; and Lexis-Nexis.

To perform our analysis, historical accounting data for the bond-issuing firm are also required. We search for relevant financial data using Worldscope and are able to collect necessary measures for a final dataset of 215 firms. These firms are targets of 289 government purchases, and have 1,279 sample bonds outstanding that meet our selection criteria, thus yielding 5,126 bond-year observations.

2.1 *Descriptive Statistics*

We provide a first insight into the composition of our sample by analyzing the government investment transactions included in the final dataset. The sample includes a total of 289 government purchase transactions, valued at US$ 334 billion. Core descriptive information is presented in multiple panels in Table 1. Panel A breaks down government investments by year of announcement. Approximately half of our government purchases (55% by transaction value, for a total of US$ 188 billion) spans the crisis years 2008-2010, allowing for a comparison between the recent financial crisis and previous years.

Panel B details government investments by stake ownership. Investments worth US$ 175 billion, 52% of our sample transactions by deal value, involve non-controlling ownership (less than 50%). Investments worth US$ 109 billion, 33% of our sample, involve controlling, but not full, ownership. Finally, investments for US$ 51 billion, 15% of our sample, involve full government stock ownership.

Panel C describes the country of origin of the acquiring government. 30% of our sample by deal value (US$ 99 billion), but only about 4% by the number of transactions, originates from the United Kingdom. The list of governments leading in total value of acquisitions includes Singapore (11%), the United Arab Emirates (9%), the Russian Federation (7%), Germany (7%), and the Netherlands (6%).

Panel D describes the transaction sample in terms of country of incorporation of the target. The top nation is again the United Kingdom, with 36% of all deal value (US$ 120 billion), likely due to the British government rescuing the domestic financial industry during the recent crisis. The other top target nations by total value are the United States (13% of the sample), Germany (8%), the Russian Federation (7%), and the Netherlands (6%).

Panel E describes our sample in terms of target industry. Target firms are classified according to one-digit US SIC codes. The leading target industry is SIC code 6, 'Finance, Insurance and Real Estate', comprising 98 deals worth US$ 174 billion (52% of the sample, by deal value). The utility sector, SIC code 4, 'Transportation, Communications, Electric, Gas, and Sanitary Services,' attracts the second largest number (86) and value (US$ 97 billion) of state investments. No other industrial sector attracts more than seven percent of total investment.

*** Insert Table 1 about here ***

2.2. *Variables*

Our main analysis is based on panel regressions, with yield spreads as response variables and proxies for the cost of debt. The variables used in this analysis are described in Table 2.

*** Insert Table 2 about here ***

Descriptive statistics relevant to the main variables are included in Table 3. The presence and level of government investment in target firms serve as our primary explanatory factors of interest. *Govt presence* is a binary variable taking a value of 1 if there is any government ownership in the firm during a specific calendar year, and 0 otherwise; we also collect levels of state ownership represented as a percentage of a firm's shares. As presented in Table 3, out of a total of 5,126 bond-years, 3,148 (61%) involve the presence of government. Mean government ownership is 13.67% for the overall sample and 22.26% for the sample of bond-years in which government is present as a shareholder.

We account for foreign governments investing in our target firms, as this type of state ownership could yield different effects on the cost of debt of target firms. Foreign government ownership consists of 1,358 observations (bond-years), which is 26% of the overall sample and 43% of the sample with state ownership. Also, because the recent financial crisis has spurred large waves of government intervention, we also include a financial crisis indicator taking a value of one when credit spreads are measured in the period 2008-2010 and find that 1,834 of the observations (36% of the overall sample) span the financial crisis period.

To further explore how government involvement can affect debt pricing, we disaggregate state ownership into different investing entities. Specifically, government owners are split into seven categories: *Central govt*, consisting of the national government and its treasuries and ministries (comprising 581 bond-year observations and 18% of the sample with government ownership); *Govt financial institution*, comprised of central banks, government development banks, and other state financial institutions (212 observations; 7% of the state ownership sample); *Local/regional govt*, a state owner representing a state, city, or region (77 observations; 2% of the state ownership sample); *Pension fund*, a government-run pension fund (784 observations; 25% of the state ownership sample); *Mixed SOE*, a partially government-controlled enterprise that has some non-government ownership (1,649 observations; 53% of the state ownership sample); *Full SOE*, state-owned enterprises (913 observations; 29% of the state ownership sample); and *SWF*, sovereign wealth funds (897 observations; 28% of the state ownership sample).

As a first control variable, we include S&P credit ratings obtained from Datastream. We form an ordinal scale with the best credit quality assigned the highest number, and we use the natural logarithm of credit rating to account for possible nonlinearity. The expected sign of the coefficient on the credit rating is negative – the higher the credit rating, the lower the spread. The median credit rating in our sample corresponds to an S&P rating of "A-".

The number of days to maturity is also included in our models, with an expected positive coefficient due to more uncertainty over the lifetime of the bond. Average time to maturity in our sample is about 2800 days, or 7.7 years. We also control for the bond's age, defined as the number of days between the issue date and the date on which the spread was collected; average bond age in our sample is 1644 days, or approximately 4.5 years. Houweling, Mentink, and Vorst (2005) document the age of the bond as one of the most important determinants of bond market liquidity. We expect a negative relation between bond age and credit spreads, as in Borisova and Megginson (2011), since as the bond's maturity date approaches there is less uncertainty associated with its coupon and par value payments.

Banks and other financial institutions are often treated separately in empirical analysis, as their capital structures are typically different from those of other firms and because they generally enjoy higher

levels of government support in case of distress. We accordingly define an indicator variable identifying banking firms based on the firm's industry classification, name, and business description, and we expect this variable to be negatively associated with firms' cost of debt. Over one-fourth of all target firm observations (1,300 of 5,126 total firm-years observations) relate to investments in commercial banks.

We further include controls for firm leverage (computed as total assets minus equity, divided by equity) to serve as a proxy for the probability of default. Including firm leverage as a control variable also allows us to account for the impact of deleveraging associated with capital injections. We expect firms with higher leverage to have a higher cost of debt, as in Collin-Dufresne, Goldstein, and Martin (2001) and Krishnan, Ritchken, and Thomson (2005). We also include the market-to-book ratio (with an average of 1.86) and size (proxied by the natural logarithm of total assets, with a mean of 10.96), as both have been shown by Fama and French (1993) to explain variation in bond returns. Larger firms are generally considered safer, at least partially due to increased asset diversification; hence, we expect a negative relationship between firm size and cost of debt. Market-to-book is generally viewed as a proxy for the growth prospects of the company, so we expect higher growth opportunities to be associated with more ease of debt repayment, and, hence, a lower cost of debt. Finally, we include return-on-equity (with a mean of 7.47%), which Crabbe and Fabozzi (2002) document being associated with ease of debt repayment. Accordingly, we expect return-on-equity to be negatively associated with the cost of debt. Further, we obtain collateral and instrument types from Bloomberg, as those could also have an impact on bond pricing. We consider twenty-six different types of collateral and instrument types.

Our sample also includes transactions related to government bailouts, and we account for these rescues in an attempt to isolate their effect on bond spreads. Bailouts are identified using SDC deal synopses, as well as reports from the press and company financial statements. We identify 479 bond observations (9% of our sample) from 27 firms related to bailouts for the full sample, with the bulk of these occurring during the 2008-2010 period (472 bond-years of 26 firms). We filter out these observations whenever performing regression analysis for the crisis period or employing a financial crisis binary variable.

*** Insert Table 3 about here ***

2.3.   Mean Differences Tests

Before presenting our main, panel-based analysis, we offer a first look at the data though tests for differences in means presented in Table 4. In our analysis, we compute mean spreads for various bond-year data subsets: with and without government ownership, distinguishing between domestic and foreign government ownership, for the crisis and non-crisis sub-periods, and isolating issuers that belong to the banking sector. Given that each firm in our sample can have multiple bond observations, the distribution

of spreads is possibly clustered at the firm level. As discussed by Peterson (2009), clustering of observations can lead to problems in the estimation of standard errors. Accordingly, we employ a standard error estimation methodology adjusted for clustering (at the firm level) as discussed by Skinner, Holt, and Smith (1989). We then employ the clustered standard-error estimates to compute two-sample t-test for mean differences between data subsets.

For the earlier years of the sample period (1990-2007), bond spreads of firms with government ownership are significantly higher than those without government ownership (167 bp vs. 118 bp). However, during the 2008-2010 financial crisis we find significantly lower spreads in bond-years with government presence (with a mean spread of 311 bp) than in those without government presence (396 bp).[9] We interpret these univariate results as indicative of the importance of the implicit government guarantee during times of financial distress.

We also compare government ownership by the relation of the investing government to its target firm. Firms are grouped based on whether the majority of their government ownership is held by a domestic state entity or a foreign one. Firms with a majority of domestic government ownership have a lower mean spread (147 bp) than firms with a majority of foreign government ownership (270 bp) over the period 1990-2007. But during the 2008-2010 crisis, firms with domestic government ownership have a cost of debt (314 bp) not statistically different from those with foreign government ownership (307 bp).

Our last set of reported univariate results indicates that banking firms have significantly lower average bond spreads than non-banking firms when government owners are present. However, for the subsample without state ownership, we find that this significant difference exists in the pre-crisis years but disappears during the crisis years of 2008-2010, indicating the relatively greater importance of state guarantees for banks in this period. Governments likely recognize the importance of backing troubled financial institutions: 65% of our bank observations are from bailed-out firms, compared to only 7% of our non-bank observations.

The univariate analysis suggests that government ownership, while generally associated with a higher cost of debt, leads to a reduction in cost of debt during times of economic distress. These results are consistent with the increased value of an implicit government debt guarantee when default is, unconditionally, more likely. Such an effect appears to be most important for banking firms during a period of financial crisis. Our panel regressions in the next section allow us to further examine the association between government ownership and debt pricing and to clarify which state entities could have the strongest effect on the cost of debt.

*** Insert Table 4 about here ***

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[9] Here and in the remainder of the paper, discussed results are statistically significant at the 10% level or lower, unless otherwise indicated.

3.   Panel Regressions

3.1.   *Methodology*

We employ regression analysis to test the effect of government ownership on a target company's cost of debt, measured by its bonds' credit spreads. To control for heteroskedasticity and account for time-series dependence, firm-clustered standard errors are also employed, as suggested by Petersen (2009). Year fixed effects are also used in all regressions. Similar to Borisova and Megginson (2011), the preliminary model is as follows:

$$y_{it} = \varsigma + \beta X_{it} + \gamma r_{it} + v_t + \varepsilon_{it}, \tag{1}$$

where y_{it} represents the credit spread, ς is an intercept term, β is a set of coefficients, and X_{it} is a matrix of explanatory variables. γ is a scalar coefficient, r_{it} is the credit rating, v_t (t = 1...20) represents the yearly fixed effects, and ε_{it} is a classical error term. The indices i and t refer, respectively, to bonds and years.

The explanatory variables include control factors, as described in Section 2.2, and variables of interest related to government ownership. Depending on the specific model being tested, we employ either binary variables identifying bond-years with government shareholders or continuous variables measuring the size of the stake owned by the government, expressed as a percentage. In additional specifications, we identify the presence or stake owned by specific categories of government shareholders. Further, to allow for the different impact of government ownership on the cost of debt during times of distress, we add interactions between the government-ownership variables and metrics of economy or firm distress. To alleviate endogeneity concerns, we evaluate the cost of debt for the same firm in years with and without government ownership and we also lag government ownership values (e.g., December 2006 ownership is matched with bond spreads in November 2007), as in Borisova, Brockman, Salas, and Zagorchev (2012).

All models in the analysis use an orthogonalized value of credit rating to control for the impact of other independent variables on its assigned value. Liu and Thakor (1984) present a detailed discussion of the residual transformation procedure, and more recently, other works have also used it for the credit rating of bonds (Datta, Iskandar-Datta, and Patel, 1999; Klock, Mansi, and Maxwell, 2005; Borisova and Megginson, 2011).

3.2.   *Government Ownership and Cost of Debt by Government Investor Categories*

We apply the model described in the previous section and present results regarding the effect of government ownership on the cost of debt in Table 5. In Panel A, our main explanatory variable of interest, government ownership, is expressed as a binary variable, equal to 1 in the year of interest, if the

bond is issued by a firm for which at least one shareholder is a government or government-owned entity. In Panel B, the explanatory variable of interest is the size of the firms' stake held by all government-owned shareholders during the year of interest. In Model 1, we consider overall government ownership, which is broken down by government acquirer type in the models to follow: sovereign wealth funds (SWF) in Model 2; central government in Model 3; local and regional government in Model 4; full state owned enterprises (full SOE) in Model 5; mixed state owned enterprise (mixed SOE) in Model 6; government owned pension funds in Model 7 and government financial institutions in Model 8.

We evaluate the data over the full 1990-2010 period and add a variable identifying the 2008-2010 financial crisis period and interactions between the 'financial crisis' binary variable and the government ownership metrics. By focusing on the years 2008-2010, during which most worldwide markets were affected by a global financial crisis, we make use of this exogenous shock to firms, allowing us to measure the differential impact of government ownership with limited concerns of reverse causality.

The results in Table 5, Panel A indicate that the presence of government ownership is associated with a higher cost of debt, with a spread increase of approximately 52 bp during non-crisis years. But during the recent financial crisis, the presence of government ownership is associated with a decrease in the cost of debt of approximately 24 bp. This means that government ownership is associated with a 52 bp increase in the cost of debt, but the interaction between the financial crisis and government presence leads to a decrease in the cost of debt equal to 76 bp; the full impact is given by the sum of the estimated coefficients. In Models 2 to 8, we observe that the increase in the cost of debt during the non-crisis years is due to government financial institutions (with an increase in spread equal to 132 bp), local/regional governments (87 bp), pension funds (71 bp), and mixed SOEs (39 bp), in order of magnitude. On the other side, the lower cost of debt during the financial crisis is driven by mixed SOEs and local/regional governments, each associated with a discount of approximately 48 bp.

The Table 5, Panel B results show that the stake of government ownership does not appear to impact the cost of debt in a statistically significant manner prior to the 2008 crisis, but each percentage point of government ownership is related to 1 bp decrease in the cost of debt during the financial crisis. When disaggregating results by government investor types, we find that shareholding amounts by SWFs or other government-owned financial institutions are associated with an increase in the cost of debt, while the discount during the financial crisis is mostly due to holdings of central governments and mixed SOEs. This is consistent with the "investor" nature of SWFs and financial institutions and "protector" nature of the central government and some of its most efficient SOEs.[10] Government financial institutions, pension

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[10] Dinc and Gupta (2011) show that profitable firms are likely to be privatized early. The mixed SOE firms have the benefit of not only being more profitable and efficient prior to the time when a part of the ownership is allocated to private investors, but also later on due to the higher efficiency of partially private ownership.

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funds, and SWFs, in particular, are typically motivated by economic goals for their investments. Central governments, on the other hand, pursue economy-wide stabilization goals, especially during the crisis times.

Overall, our first set of results is consistent with the idea that government shareholding increases the cost of debt during regular, non-crisis years but decreases the cost of debt of portfolio holdings during the recent financial crisis. We find this decreasing effect most striking when considering the overall presence of state ownership, as well as when looking at the existence of local government and mixed SOE ownership. This result is largely consistent with governments introducing inefficiencies and the pernicious effects of moral hazard but offering, at the same time, implicit debt guarantees that become extremely valuable during times of distress. To further investigate the plausibility of those implicit debt guarantees, we investigate distinctions between domestic and foreign government ownership in the following section.

*** Insert Table 5 about here ***

3.3   *Domestic versus Foreign Government Ownership*

We hypothesize that domestic and foreign government investments are motivated by different sets of priorities. Our expectation is that the desire to maintain high levels of employment and political concerns about market failures are likely to strengthen the implicit debt guarantees offered by government shareholders on their domestic portfolio holdings. We also expect a weaker implicit debt guarantee to be provided by foreign government ownership since government influence in foreign markets is likely to be weaker. Additionally, investments by foreign governments are more likely to be commercially-oriented (motivated by profit seeking) and thus are less likely to involve the creation of implicit debt guarantees. Accordingly, we expect the previously-documented results to appear stronger for the subsets of domestic and foreign government ownership. We expect the domestic implicit government guarantee to play a larger and more positive role in influencing the cost of debt of government-owned firms, especially during the financial crisis.

Results for the effect of domestic versus foreign government ownership on the cost of debt are presented in Table 6. Our main explanatory variable of interest, government ownership, is expressed as presence (binary variable) in Panel A and as a stake (percentage) in Panel B. In Model 1, we present results for domestic government ownership over the full 1990-2010 period; in Model 2, for foreign government ownership over 1990-2010; in Model 3, for domestic government ownership over 1990-2007; in Model 4, for foreign government ownership over 1990-2007; in Model 5, for domestic government ownership over 2008-2010; and in Model 6, for foreign government ownership over 2008-2010.

Table 6, Panel A reveals that the presence of a domestic government shareholder significantly decreases in the cost of debt of its portfolio-holdings by approximately 56 bp during the recent financial crisis. No similar pattern is associated with foreign government presence, as the latter is always associated with a statistically insignificant increase in the cost of debt. During the non-crisis period neither foreign nor domestic government ownership has a statistically significant impact on the cost of debt of portfolio-holdings.

Table 6 Panel B reveals similar results. A larger stake owned by a domestic government shareholder is associated with a lower the cost of debt, but the effect is statistically significant only during the recent financial crisis. The result is, however, economically important, as the cost of debt tends to decrease by 1 bp for every percentage point of domestic government ownership. On the other hand, a stake owned by a foreign government is positively associated with the cost of debt, but the effect is statistically significant only during the non-crisis years. The effect is, again, economically significant, with the cost of debt increasing by 1.25 bp for every percentage point in foreign government ownership.

Overall, the distinction between domestic and foreign government ownership and between crisis and non-crisis years reveals that the impact of government ownership on the cost of debt can vary, and that a pooled analysis risks obfuscating important nuances. In particular, our more detailed analysis indicates that domestic government ownership decreases the cost of debt of firms during crisis years, while foreign government ownership increases the cost of debt during non-crisis years. These results are, once more, consistent with the view that government ownership influences firm behavior through multiple channels, whose relative importance and net effect depend on environmental factors. Times of distress reveal the dominance of an implicit debt guarantee, especially valuable when default is more likely and stronger when the investor is a domestic government. Conversely, ownership by a foreign government entity creates a distortion of incentives (and possibly a monitoring gap as described by Bortolotti, Fotak, and Megginson, 2010) that proves particularly deleterious in non-crisis years.

*** Insert Table 6 about here ***

3.4   *Distressed Firms*

We further investigate the influence of government ownership on the cost of debt when firms are in financial distress. Noting that the value of debt guarantees is likely to increase as default becomes more likely, we have focused on testing whether government ownership affects the cost of debt differently during a financial crisis in section 3.2. Although an exogenous shock such as a financial crisis allows us to limit concerns of reverse causality, it also presents a different set of challenges – during such an encompassing crisis, firm distress is often accompanied by a reduction in the supply of credit. Hence, a reduced cost of debt associated with government ownership could be because government shareholders

ease access to capital markets, rather than because government shareholders are providing a debt guarantee. To check for such debt-supply effects, we further analyze the impact of government shareholding on the cost of debt around firm-years of firm-specific distress, during which we have no reason to suspect a systemic debt-supply shock. Accordingly, to identify a sample for which distress is more likely, we focus on firms that issue non-investment grade (junk) bonds.

Moreover, we investigate whether the influence of government ownership on the cost of debt of distressed firms differs during the economy-wide financial crisis and according to whether the government is foreign or domestic. Therefore, besides analyzing the influence of government ownership on the cost of debt of firms that are in distress over our full 1990-2010 period, we also examine that influence for the 2008-2010 financial crisis period and the pre-crisis period of 1990-2007. This allows us to evaluate whether the implicit government guarantee influences the cost of capital for distressed firms in general and also during economy-wide distress. Finally, we also break down government owners of firms that issue non-investment grade bonds into foreign and domestic entities.

Results for the effect of government ownership on the cost of debt of firms that issue non-investment grade bonds are presented in Table 7. Our main explanatory variable of interest—government ownership—is expressed as presence (binary variable) in Panel A and as a stake (percentage) in Panel B. In Model 1, we present results for domestic government ownership over the full 1990-2010 period; in Model 2, for foreign government ownership over 1990-2010; in Model 3, for domestic government ownership over 1990-2007; in Model 4, for foreign government ownership over 1990-2007; in Model 5 for domestic government ownership over 2008-2010 and in Model 6 for foreign government ownership over 2008-2010.

*** Insert Table 7 about here ***

Table 7, Panel A shows that the cost of debt is a function of the presence of domestic government ownership for the overall 1990-2010 period and also for the 2008-2010 crisis period. Domestic government presence lowers the cost of debt by approximately 73 bp over the overall 1990-2010 time period and even more so, by approximately 133 bp, over the 2008-2010 crisis period. On the other hand, the cost of debt is positively and significantly associated with the presence of the foreign government ownership in all models. The presence of foreign government ownership in firms that issue non-investment grade bonds is associated with an approximately 143 bp increase in the cost of debt during the overall 1990-2010 period and during the 2008 financial crisis. Furthermore, foreign government ownership is associated with even higher spreads during the 'pre-crisis' period, as compared to the crisis period. Spreads for firms with non-investment grade bonds that have foreign government ownership are about 210 bp higher during the 1990-2007 period.

Table 7, Panel B results echo those of Panel A as domestic government stake ownership is associated with a lower cost of debt for firms with non-investment grade bonds during the 2008 crisis. Results imply that a 1 percentage point increase in domestic government ownership leads to about a 7 bp reduction in the cost of debt for firms with non-investment grade bonds during the crisis and to about a 2 bp reduction over the whole 1990-2010 period. Panel B also shows that foreign government ownership increases the cost of debt for firms that issue non-investment grade bonds, but the significant relation is present only for the pre-crisis 1990-2007 period. Nevertheless, while foreign government presence leads to a significantly higher cost of debt for non-investment grade bond issuers overall, the stake that a foreign government owns matters as well prior to the onset of the crisis. Further, the increase in the cost of debt is economically significant – a 1 percentage point increase in foreign government ownership leads to about a 4 bp increase in the cost of debt of non-investment grade bond issuers over the 1990-2007 period.

Overall, the results in Table 7 for non-investment grade bond issuers support our results in Table 6 for all firms and are even stronger in showing the distinct influence of foreign and domestic government ownership, especially during the financial crisis. The domestic government's implicit guarantee matters for distressed firms (that issue non-investment grade bonds) and is significantly associated with a lower cost of debt over the full 1990-2007 period and over the 2008-2010 financial crisis. On the other hand, foreign government ownership is associated with a higher cost of debt for firms with non-investment grade bonds, especially in the pre-crisis 1990-2007 period. Our interpretation of these results is that the implicit government guarantee is important for the cost of capital during a variety of distress periods—whether economy-wide or firm-specific. Also, this implicit government guarantee is provided mainly by the domestic, rather than foreign, government ownership of distressed firms, which is also similar to the results for the full sample in section 3.3.

4. Robustness and Extensions

In this section we carry out checks of the robustness of our results to alternative specifications. We check for the influence of government ownership on the cost of debt using an alternative economy-wide distress specification. We also group all categories of government acquirers from Tables 5 and 6 together into one regression and analyze the results over three periods—the full 1990-2010 period, the pre-crisis period of 1990-2007, and the financial crisis period of 2008-2010. These alternative models are presented in Table 8. In Model 1 we present the results for the influence of the presence of government ownership on the cost of debt during various banking crises for the full 1990-2010. Model 2 examines debt pricing for highly-levered firms that have strong direct government ownership. Models 3-8 evaluate the simultaneous impact of different government investor type categories on the cost of debt. Our main

explanatory variable of interest, government ownership by different acquirer types, is expressed as presence (dummy) in Models 3, 5, 7 and as a stake (percentage) in Models 4, 6, 8. Results are also presented for three time periods: the full 1990-2010 period in Models 3 and 4; the 1990-2007 period in Models 5 and 6; the financial crisis 2008-2010 period in Models 7 and 8.

In Table 8, Model 1 we adopt a broader definition of the 'crisis' by focusing on a wide sample of banking crises identified by Laeven and Valencia (2010) and show that our results still hold.[11] The authors identify banking crises based on two conditions: "(1) Significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and bank liquidations); and (2) Significant banking policy intervention measures in response to significant losses in the banking system" (Laeven and Valencia, 2010). The dataset lists country-years in which banking crises occur across the world from 1970 to 2009. In this analysis, we find that government shareholding is associated with an increase in the cost of debt of 39 bp in non-banking-crisis years. During a banking crisis, the cost of debt of non-government owned firms in our sample increases by 68 bp, but the estimated coefficient associated with the interaction between government ownership and banking crises indicates that the increase in the cost of debt for government-owned firms during a banking crisis is much lower (below 14 bp). Accordingly, during a banking crisis the cost of debt of government-owned firms is about 15 bp lower. This robustness test confirms our general findings that government ownership is associated with a higher cost of debt during normal economic periods, but with a lower cost of debt during periods of distress, consistent with the creation of implicit debt guarantees.

As a robustness check for our distressed firm models in section 3.4, Model 2 of Table 8 features an interaction between firm leverage and the existence of a strong government presence, proxied by shareholdings by central governments, during the 1990-2007 pre-crisis period. Although we show previously that central government presence can help lower the cost of debt during the crisis, it could also aid highly-levered firms facing debt problems that are more firm-specific than macroeconomic. Model 2 shows no significant link between central government ownership and debt pricing for the full sample of firms but also displays that the cost of debt drops for more highly-levered firms with national government ownership. This result complies with our earlier analysis of non-investment grade bond issuers by showing how government guarantees are more valuable to firms facing distress.

In Table 8, Models 3-8 group the ownership from different government entities into one regression, and our results are similar to those of Table 5. These models allow us to compare firm-years with ownership of each government entity to non-government owned firm-years, while controlling for the effects of other government owners. We document that during the 2008-2010 crisis the cost of debt is a

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[11] We thank Luc Laeven for making a dataset identifying banking crises available at http://www.luclaeven.com/Data.htm.

significant negative function of government ownership by central governments and mixed SOEs. Models 7 and 8 show that during the crisis the reduction in the cost of debt for firms with ownership by central governments is 75 bp, and a 1 percentage point increase in central government ownership is associated with a 1.2 bp reduction. Also, mixed SOE ownership is associated with a 90 bp reduction in the cost of debt of the targets, where a 1 percentage point increase in mixed SOE ownership leads to a 2.23 bp reduction in the cost of debt. Finally, outside of the crisis and during the overall 1990-2010 period, the cost of debt is significantly and positively linked to government ownership by government financial institutions and SWFs.

Models 7 and 8 also comply with the pattern noted in Table 5, where the implicit government guarantee is the strongest during the crisis for the types of government acquirers that have a 'protector' function, rather than an 'investor' function. Lower cost of debt for firms during the 2008 crisis is associated with central government ownership, as well as full and mixed SOE ownership, while the higher cost of debt during this period is associated with the government 'investor' group—government financial institutions and pension funds. These results on the influence of different types of government investors according to their 'protector' or 'investor' functions support the notion that different state actors operate with diverse objectives. Further investigation along these lines could provide more insight into the channels through which government entities affect the cost of debt.

*** Insert Table 8 about here ***

5.   Conclusions

Our research examines how government ownership affects firms' cost of debt. As documented by Faccio, Masulis, and McConnell (2006) and Brown and Dinç (2005), governments are generally reluctant to allow state-owned firms to default. Accordingly, government ownership might provide an implicit debt guarantee reducing the chance of default and, hence, the cost of corporate debt. On the other hand, the implicit debt guarantee might induce moral hazard for managers, by reducing the probability of disciplinary replacement, by eliminating takeover threats, and by minimizing the risk of bankruptcy. Such an increase in moral hazard is thus likely to lead to higher risk taking and, thus, to a higher cost of debt. Also, government ownership could increase the cost of debt by imposing social and political goals that reduce corporate profitability and thus increase default risk. Given these two conflicting effects of government ownership on the cost of debt, we note that the resulting impact is a matter deserving empirical investigation.

In panel regressions, we analyze yield spreads on a sample of 1,279 bonds issued by 215 publicly-traded firms subject to changes in government share ownership from 43 countries over 1990-2010. We note that a government guarantee on the debt of investment targets is likely to be more valuable

during times of economic hardship as defaults are, all else equal, more likely during recessions. Focusing on the recent financial crisis, we find that government ownership affects the cost of debt differently in crisis versus non-crisis years. During non-crisis years, firms with the government as a shareholder display an increase of 52 bp in bond spreads. On the other hand, during the recent financial crisis, government presence is associated with a 24 bp decrease in spreads. We find similar results when adopting a broader definition of 'financial crisis' (from Laeven and Valencia, 2010) in robustness tests.

Different government-owned entities vary in terms of objectives and *modus operandi* – and we conjecture these varying goals could differentially impact the cost of debt. When not isolating the recent crisis period, we find that the increase in cost of debt during the non-crisis years is generally due to ownership by government-owned financial institutions, SWFs and pension funds. On the other hand, firms with central, local, and SOE government ownership are mostly responsible for the decrease in the cost of debt during the crisis. We further find that large stakes owned by central governments and by mixed SOEs lead to lower cost of debt, while large stakes owned by SWFs and other government-owned financial institutions increase the cost of debt. Overall, our evidence is consistent with the idea that certain government investors act as protectors, favoring political goals (typically inconsistent with firm default) and providing the strongest implicit debt guarantees. On the other hand, the increase in the cost of debt is mostly specific to financial arms of the government, whose objectives are more similar to those of other institutional investors (i.e., often commercial) and, as such, do not lead to a similar implied debt guarantee.

We further note that implicit government guarantees are likely to be strongest for domestic targets. Correspondingly, we find that the implicit debt guarantee documented during the recent financial crisis is specific to domestic government presence. Conversely, foreign government ownership is associated with an increase in the cost of debt during the non-crisis years, equal to about 1 bp for each percentage point of stake owned.

We finally note that the value of a debt guarantee is greater the higher the likelihood of default. Mindful of the distinction between the impact of domestic and foreign government ownership, we focus on a sample of non-investment grade bonds and find domestic (foreign) government ownership during crisis (non-crisis) years to be associated with a lower (higher) cost of debt. The results are economically strong: for non-investment grade bonds, domestic government presence leads to a discount of 72 bp over the entire period and of 133 bp during the crisis years. Foreign government presence is associated with an increase in the cost of debt of 143 bp during the crisis and 209 bp in non-crisis years.

On balance, these results suggest that stock ownership by domestic governments improves the perceived creditworthiness of corporate bond issuers by providing an implicit bond payment guarantee. This guarantee becomes especially valuable during a financial crisis or in the presence of firm-specific

distress factors. On the other hand, during non-crisis years, government ownership is associated with higher spreads – and the result is mostly due to shareholding by foreign governments and by government-owned financial institutions.

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Table 1. Descriptive statistics at the transaction level

The table details government investments from 289 transactions. It shows the number of deals, value of deals and percentage of deal value invested. The sample covers transactions from the period 1980-2010. Government investment is broken down by the year of transaction announcement in Panel A, by the percentage of government ownership in Panel B, by the country of the government acquirer in Panel C, by the country of the target in Panel D and by the target SIC in Panel E.

Panel A. Government investment by transaction year (announced)

Year	Deal Count	Deal Value USD (mil)	Proportion of Total (count)	Proportion of Total (value)
prior to 1990	20	6,138	7%	2%
1990	9	6,629	3%	2%
1991	13	1,387	4%	<1%
1992	5	1,094	2%	<1%
1993	10	820	3%	<1%
1994	5	11	2%	<1%
1995	9	23	3%	<1%
1996	9	860	3%	<1%
1997	9	4,495	3%	<1%
1998	11	17,012	4%	5%
1999	9	8,570	3%	3%
2000	6	4,708	2%	1%
2001	10	11,590	3%	3%
2002	13	2,846	4%	1%
2003	12	1,928	4%	1%
2004	14	1,486	5%	<1%
2005	14	34,365	5%	10%
2006	10	10,669	3%	3%
2007	23	36,230	8%	11%
2008	40	153,132	14%	46%
2009	32	28,027	11%	8%
2010	6	2,341	2%	1%
Totals	**289**	**334,361**	**100%**	**100%**

Panel B. Government investment by percentage ownership

Stake Owned	Deal Count	Deal Value USD (mil)	Proportion of Total (count)	Proportion of Total (value)
0%-10%	120	73,959	42%	22%
10%-25%	72	46,242	25%	14%
25%-50%	38	54,407	13%	16%
51%-75%	21	76,937	7%	23%
75%-99%	13	31,965	4%	10%
100%	25	50,851	9%	15%
Totals	**289**	**334,361**	**100%**	**100%**

Table 1. (continued)
Panel C. Government investment by acquirer nation

Rank	Acquiror Nation	Deal Count	Deal Value USD (mil)	Proportion of Total (count)	Proportion of Total (value)
1	United Kingdom	13	98,724	4%	30%
2	Singapore	28	35,509	10%	11%
3	Utd Arab Em	21	29,133	7%	9%
4	Russian Fed	13	24,385	4%	7%
5	Germany	9	23,438	3%	7%
6	Netherlands	8	18,433	3%	6%
7	France	31	17,381	11%	5%
8	China	7	13,831	2%	4%
9	Italy	10	12,655	3%	4%
10	Belgium	8	10,560	3%	3%
	OTHER	141	50,314	49%	15%
	Totals	**289**	**334,361**	**100%**	**100%**

Panel D. Government investment in the target nation

Rank	Target Nation	Deal Count	Deal Value USD (mil)	Proportion of Total (count)	Proportion of Total (value)
1	United Kingdom	23	120,120	8%	36%
2	United States	43	42,301	15%	13%
3	Germany	13	26,781	4%	8%
4	Russian Fed	15	23,331	5%	7%
5	Netherlands	5	18,691	2%	6%
6	Switzerland	3	15,045	1%	4%
7	Belgium	7	14,774	2%	4%
8	Italy	6	12,655	2%	4%
9	Australia	9	10,086	3%	3%
10	Sweden	8	9,103	3%	3%
	OTHER	157	41,474	54%	12%
	Totals	**289**	**334,361**	**100%**	**100%**

Panel E. Government investment by target SIC category

Target SIC	Description of Target SIC	Deal Count	Deal Value USD (mil)	Proportion of Total (count)	Proportion of Total (value)
0	Agriculture, forestry, and fishing	3	2,250	1%	1%
1	Mining, construction	22	23,758	8%	7%
2	Manufacturing (food, fabric, wood, chemical)	23	19,661	8%	6%
3	Manufacturing (rubber, plastic, glass, metal; boat, rail, air equipment)	31	12,960	11%	4%
4	Transportation, communications, electric, gas, and sanitary service	86	96,658	30%	29%
5	Trade (wholesale, retail)	12	2,181	4%	1%
6	Finance, insurance, and real estate	98	174,249	34%	52%
7	Services (hotel, beauty, funeral, computer, car rental & repair, movie)	10	2,564	3%	1%
8	Services (doctor's offices, legal, schools, religious, accounting)	3	80	1%	0%
	Totals	**289**	**334,361**	**100%**	**100%**

Table 2. Variable definitions

Ownership data are from SDC Platinum (and integrated with information from available financial disclosures and news reports). Bond data are obtained from Bloomberg and DataStream. Financial data are obtained from the Worldscope database.

Government Ownership Variables	
Govt presence	Takes a value of 1 if the company currently has some government ownership, and 0 otherwise.
Govt ownership (%)	Percentage of the company owned by the government. Obtained from Thomson ONE Banker ownership module, company financial reports, and press releases.
Macroeconomic Variables	
Fin. crisis	Takes a value of 1 for the years 2008, 2009 and 2010, and 0 otherwise.
Banking crisis	Takes a value of 1 for the years defined as a banking crisis by Laeven and Valencia (2010), and 0 otherwise.
Bond Variables	
Rating	The natural log of Standard and Poor's bond rating, after conversion to an ordinal scale. (AAA = 22, AA+ = 21, etc.)
Age	The time since the issue date, in days.
Maturity	The time till maturity, in days.
Firm Variables	
Leverage	(Total assets – Stockholders equity) / Stockholders equity
Market-to-book	(Total shares * Closing share price) / Stockholders equity
Size	The natural log of total assets.
ROE	Net income / Stockholders equity
Bank	Takes a value of 1 if the target company is a bank, and 0 otherwise.
Government Investor Types	
Central govt	Takes a value of 1 if the investing entity is a central government, and 0 otherwise.
Govt financial institution	Takes a value of 1 if the investing entity is government-owned financial institution (e.g. Central Bank), and 0 otherwise.
Local/regional govt	Takes a value of 1 if the investing entity is a local or regional government, and 0 otherwise.
Pension fund	Takes a value of 1 if the investing entity is a government-owned public pension fund, and 0 otherwise.
SOE mixed	Takes a value of 1 if the investing entity is a government-controlled enterprise that is now at least partially owned by non-government investors, and 0 otherwise.
SOE full	Takes a value of 1 if the investing entity is a 100% state-owned enterprise, and 0 otherwise.
SWF	Takes a value of 1 if the investing entity is a sovereign wealth fund, and 0 otherwise.

Table 3. Descriptive statistics

The table describes the number, mean, standard deviation, 25th, and 75th percentiles of the variables used in the analysis. Variable definitions are provided in Table 2. The sample covers the period 1990-2010. Credit spreads in the top and bottom 1% of all observations are dropped. Panel A reports descriptive statistics for continuous variables, while Panel B contains descriptive statistics for binary variables. Bond-years can be associated with more than one state investment vehicle type listed in Panel B.

Panel A. Continuous variables

Continuous Variables	Count	Mean	Median	Standard deviation	25th percentile	75th percentile
Credit spread	5,126	214.39	133.90	236.63	67.80	271.30
Government Variables						
Govt ownership	5,126	13.67	2.29	22.47	0.00	15.29
Govt ownership > 0	3,148	22.26	10.74	25.12	3.66	31.90
Bond Variables						
Rating	5,126	15.87	16.00	3.18	14.00	18.00
Age (days)	5,126	1,644	1,310	1,371	604	2,309
Maturity (days)	5,126	2,809	1,857	3,188	968	3,248
Firm Variables						
Leverage	5,126	11.39	3.81	13.42	1.62	19.69
M_B	5,126	1.86	1.63	1.34	1.09	2.24
Size	5,126	10.96	10.64	2.44	9.25	13.16
ROE	5,126	7.47%	11.24%	34.18%	5.49%	16.96%

Panel B. Binary variables

Binary Variables	Count	Yes (1)	No (0)
Government Variables			
Govt presence	5,126	3,148	1,978
Central govt		581	
Govt fin. institution		212	
Local/regional govt		77	
Pension fund		784	
SOE mixed		1,649	
SOE full		913	
SWF		897	
Bailed out	5,126	479	4,647
Fin. crisis	5,126	1,834	3,292
Foreign govt investor	5,126	1,358	3,768
Firm Variables			
Bank	5,126	1,300	3,826

Table 4. Mean difference tests

The following table presents two-tailed tests of differences in means for companies with and without government ownership for the dependent variable (*Credit spread*) and the major independent variables. Variable definitions are provided in Table 2. For the comparison of foreign and domestic government ownership, firms are grouped based on whether the majority of their government ownership is held by a domestic state entity or a foreign one. The sample covers the period 1990–2010. The *p*-value shows the significance level of the two-tailed difference in means test, with standard errors clustered at the firm level (as in Skinner, Holt and Smith, 1989).

Variable	Full sample	Govt presence	No govt presence	*p*-value	Count
Credit spread	214.39	225.14	197.27	0.359	5,126
Credit spread (1990-2007)	146.07	167.25	117.94	0.017	3,292
Credit spread (2008-2010)	337.02	310.76	396.15	0.084	1,834
Credit spread (2008-2010, without bailouts)	356.95	340.68	399.33	0.358	1,530

Variable	All firms with govt presence	Majority foreign govt	Majority domestic govt	*p*-value	Count
Credit spread	225.14	293.51	200.38	0.030	3,148
Credit spread (1990-2007)	167.25	270.38	147.17	0.033	1,878
Credit spread (2008-2010)	310.76	306.85	313.57	0.913	1,270

Variable	All firms of variable category	Banks	Non-banks	*p*-value	Count
Credit spread (with govt presence)	225.14	163.63	244.69	0.009	3,148
Credit spread (without govt presence)	197.27	184.77	201.97	0.603	1,978
Credit spread (1990-2007, without govt presence)	117.94	79.93	130.87	0.005	1,414
Credit spread (2008-2010, without govt presence)	396.15	391.56	398.33	0.927	564

Table 5. Government Ownership, the cost of debt, and the 2008 Financial Crisis.

Year fixed effects (v_t) regression analysis with heteroskedasticity-robust and firm-clustered standard errors is performed on the following model: $y_{it} = \alpha + \theta X_{it} + \gamma \hat{\varsigma}_{it} + v_t + \eta_{it}$. The dependent variable, credit spread (y_{it}), is the difference between the corporate bond's current yield to maturity and that of the government bond most closely matched by maturity. α represents the intercept, and η_{it} is the error term. Orthogonalized values of the log of the bond's rating after conversion to an ordinal scale, **Rating** ($\hat{\varsigma}_{it}$), are used. The explanatory variables included in X_{it} are described in Table 2. **Bank * Leverage** is an interaction of the variables described in Table 2, and **Fin. Crisis** is interacted with each of the government owner types. The data are annual and cover the period 1990-2010. Panel A looks at government presence, and Panel B uses government ownership stakes. The models control for bond collateral/instrument type, bond currency, and issuer country. Coefficients are listed below, with t-statistics in parentheses. *** denotes significance at the 1% level, ** at the 5% level, and * at the 10% level.

Panel A. Government Ownership Presence

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Govt presence	51.82***							
	(3.436)							
*Govt presence * Fin. crisis*	-76.24**							
	(-2.195)							
SWF		72.37						
		(1.577)						
*SWF * Fin. crisis*		-24.20						
		(-0.552)						
Central govt			0.555					
			(0.017)					
*Central govt * Fin. crisis*			-95.33					
			(-1.580)					
Local/regional govt				86.92***				
				(2.609)				
*Local/regional govt * Fin. crisis*				-134.4**				
				(-2.049)				
SOE full					18.36			
					(1.043)			
*SOE full * Fin. crisis*					-48.18			
					(-1.563)			
SOE mixed						38.87**		
						(2.165)		
*SOE mixed * Fin. crisis*						-85.58***		
						(-2.896)		
Pension fund							71.38***	
							(4.589)	
*Pension fund * Fin. crisis*							-0.570	
							(-0.017)	
Govt financial institution								131.7***
								(2.795)
*Govt financial institution * Fin. crisis*								-117.7**
								(-2.417)
Fin. crisis	424.8***	383.1***	417.3***	413.5***	422.5***	410.5***	417.6***	414.5***
	(10.979)	(11.302)	(14.184)	(13.934)	(13.252)	(12.709)	(13.604)	(13.767)
Rating	-420.3***	-417.3***	-418.5***	-420.5***	-419.8***	-416.4***	-417.1***	-418.8***
	(-6.626)	(-6.542)	(-6.436)	(-6.468)	(-6.462)	(-6.474)	(-6.504)	(-6.464)
Maturity	0.00451***	0.0046***	0.00426***	0.00442***	0.00439***	0.00444***	0.00429***	0.00441***
	(4.982)	(4.977)	(4.753)	(4.921)	(4.965)	(5.015)	(4.741)	(4.968)
Age	0.00133	0.00283	0.00241	0.00220	0.00220	0.00144	0.00316	0.00276
	(0.405)	(0.887)	(0.762)	(0.702)	(0.716)	(0.470)	(0.969)	(0.892)
Leverage	1.338**	0.848	0.897	0.912	0.948	1.073*	1.016	1.008
	(2.054)	(1.310)	(1.400)	(1.407)	(1.459)	(1.675)	(1.610)	(1.544)
*Bank * Leverage*	-2.541**	-1.317	-1.598	-1.487	-1.681	-2.094**	-1.583	-1.708
	(-2.338)	(-1.153)	(-1.502)	(-1.361)	(-1.545)	(-1.995)	(-1.512)	(-1.527)
Bank	25.56	4.294	8.901	7.456	13.11	18.00	9.470	11.26
	(1.198)	(0.183)	(0.391)	(0.324)	(0.576)	(0.831)	(0.437)	(0.482)
Market-to-book	-16.91***	-15.91***	-15.46***	-15.30***	-15.37***	-15.69***	-14.30***	-15.53***
	(-3.470)	(-3.287)	(-3.155)	(-3.127)	(-3.123)	(-3.226)	(-2.936)	(-3.125)
Size	-11.70***	-13.32***	-12.51***	-12.22**	-12.27***	-13.12***	-12.12***	-13.18***
	(-2.684)	(-2.788)	(-2.679)	(-2.595)	(-2.628)	(-3.104)	(-2.680)	(-2.798)
ROE	-34.23*	-32.80	-40.56**	-40.82**	-39.06*	-34.85*	-40.37**	-39.63**
	(-1.666)	(-1.568)	(-2.055)	(-2.070)	(-1.947)	(-1.718)	(-2.012)	(-2.025)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	229.7***	273.0***	238.3***	225.5***	225.4***	254.3***	213.5***	241.1***
	(3.556)	(3.717)	(3.523)	(3.321)	(3.334)	(3.996)	(3.198)	(3.517)
Observations	4647	4647	4647	4647	4647	4647	4647	4647
R-squared	0.563	0.559	0.557	0.558	0.558	0.559	0.560	0.558

Panel B. Government Ownership Stake

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Govt stake (%)	-0.136							
	(-0.370)							
Govt stake (%) * Fin. crisis	-1.063*							
	(-1.801)							
SWF		4.803*						
		(1.844)						
SWF * Fin. crisis		-0.728						
		(-0.389)						
Central govt			-0.243					
			(-0.359)					
Central govt * Fin. crisis			-1.828*					
			(-1.826)					
Local/regional govt				2.446				
				(1.524)				
Local/regional govt * Fin. crisis				-2.732				
				(-1.636)				
SOE full					-0.917			
					(-1.303)			
SOE full * Fin. crisis					-2.805			
					(-1.587)			
SOE mixed						-0.180		
						(-0.300)		
SOE mixed * Fin. crisis						-1.827**		
						(-2.496)		
Pension fund							1.312	
							(0.532)	
Pension fund * Fin. crisis							3.329	
							(1.457)	
Govt financial institution								13.72***
								(4.744)
Govt financial institution * Fin. crisis								-1.808
								(-0.416)
Fin. crisis	428.2***	404.6***	415.1***	412.7***	416.3***	422.4***	407.5***	412.7***
	(13.341)	(13.509)	(14.110)	(13.871)	(13.860)	(13.792)	(13.743)	(13.679)
Rating	-417.3***	-417.4***	-418.0***	-420.8***	-419.1***	-418.0***	-418.6***	-419.0***
	(-6.418)	(-6.469)	(-6.428)	(-6.482)	(-6.453)	(-6.423)	(-6.457)	(-6.475)
Maturity	0.00452***	0.00417***	0.00434***	0.00436***	0.00434***	0.00448***	0.00431***	0.00455***
	(5.215)	(4.567)	(4.776)	(4.872)	(4.997)	(5.003)	(4.721)	(5.274)
Age	0.00259	0.00257	0.00257	0.00227	0.00255	0.00216	0.00248	0.00273
	(0.846)	(0.832)	(0.810)	(0.724)	(0.835)	(0.698)	(0.773)	(0.897)
Leverage	0.938	1.011	0.977	0.924	0.930	0.934	0.925	0.958
	(1.457)	(1.548)	(1.510)	(1.423)	(1.449)	(1.442)	(1.420)	(1.460)
Bank * Leverage	-1.481	-1.461	-1.626	-1.512	-1.544	-1.381	-1.485	-1.612
	(-1.390)	(-1.338)	(-1.547)	(-1.378)	(-1.428)	(-1.264)	(-1.359)	(-1.473)
Bank	11.29	8.365	9.908	7.986	11.36	10.44	7.884	8.150
	(0.498)	(0.366)	(0.437)	(0.346)	(0.502)	(0.456)	(0.346)	(0.352)
Market-to-book	-14.36***	-17.39***	-15.50***	-15.57***	-15.59***	-14.24***	-15.29***	-15.51***
	(-2.959)	(-3.573)	(-3.162)	(-3.176)	(-3.176)	(-2.872)	(-3.107)	(-3.121)
Size	-13.51***	-14.03***	-13.24***	-12.27***	-11.67**	-13.95***	-12.42***	-13.26***
	(-2.926)	(-2.930)	(-2.784)	(-2.615)	(-2.536)	(-3.199)	(-2.660)	(-2.826)
ROE	-41.85**	-31.31	-40.64**	-40.79**	-40.42**	-40.28**	-41.72**	-40.09**
	(-2.090)	(-1.526)	(-2.053)	(-2.070)	(-2.016)	(-2.001)	(-2.120)	(-2.059)
Constant	245.0***	253.1***	246.3***	232.4***	226.0***	246.8***	232.8***	243.6***
	(3.640)	(3.715)	(3.594)	(3.426)	(3.316)	(3.767)	(3.444)	(3.558)
Observations	4647	4647	4647	4647	4647	4647	4647	4647
R-squared	0.558	0.558	0.557	0.557	0.559	0.558	0.557	0.559

Table 6. Domestic and foreign government ownership and the cost of debt.

Year fixed effects (v_t) regression analysis with heteroskedasticity-robust and firm-clustered standard errors is performed on the following model: y_{it} = $\alpha + \theta X_{it} + \gamma \hat{\varsigma}_{it} + v_t + \eta_{it}$. The dependent variable, credit spread (y_{it}), is the difference between the corporate bond's current yield to maturity and that of the government bond most closely matched by maturity. α represents the intercept, and η_{it} is the error term. Orthogonalized values of the log of the bond's rating after conversion to an ordinal scale, **Rating** ($\hat{\varsigma}_{it}$), are used. The explanatory variables included in X_{it} are described in Table 2. **Bank * Leverage** is an interaction of the variables described in Table 2, and **Leverage** is interacted with each of the government owner types. The data are annual and cover the period 1990-2010. The models control for bond collateral/instrument type, bond currency, and issuer country. Panel A looks at government presence, and Panel B uses government ownership stakes. Coefficients are listed below, with t-statistics in parentheses. *** denotes significance at the 1% level, ** denotes significance at the 5% level, and * denotes significance at the 10% level.

Panel A. Domestic and Foreign Government Ownership Presence

	(1) 1990-2010	(2) 1990-2010	(3) 1990-2007	(4) 1990-2007	(5) 2008-2010	(6) 2008-2010
Domestic govt presence	8.404		5.267		-55.77**	
	(0.626)		(0.540)		(-2.043)	
Foreign govt presence		16.65		37.01		16.33
		(1.046)		(1.533)		(0.824)
Rating	-432.1***	-431.2***	-361.7***	-358.2***	-533.1***	-536.9***
	(-6.794)	(-6.794)	(-4.797)	(-4.853)	(-5.680)	(-5.649)
Maturity	0.00348***	0.00344***	0.00733***	0.00731***	-0.00181	-0.00170
	(4.019)	(4.031)	(8.306)	(8.221)	(-1.078)	(-0.954)
Age	0.00254	0.00265	0.00316	0.00308	-0.00186	-0.00105
	(0.834)	(0.882)	(0.831)	(0.834)	(-0.488)	(-0.273)
Leverage	1.195*	1.137*	1.018*	0.981*	5.925**	5.994**
	(1.824)	(1.721)	(1.749)	(1.656)	(2.167)	(2.141)
*Bank * Leverage*	-3.304***	-3.207***	-0.549	-0.383	-12.60***	-13.46***
	(-2.977)	(-2.794)	(-0.585)	(-0.382)	(-3.308)	(-3.438)
Bank	52.32**	51.04**	-9.241	-14.11	204.1***	209.6***
	(2.113)	(2.050)	(-0.465)	(-0.655)	(3.460)	(3.572)
Market-to-book	-17.25***	-17.30***	-8.642*	-8.213	-25.95**	-26.68**
	(-3.460)	(-3.481)	(-1.728)	(-1.627)	(-2.165)	(-2.179)
Size	-15.40***	-15.86***	-10.80***	-10.65***	-18.44*	-13.30
	(-3.411)	(-3.467)	(-3.071)	(-3.086)	(-1.955)	(-1.261)
ROE	-47.24**	-44.88**	-100.9**	-103.2**	68.78	72.07
	(-2.171)	(-2.024)	(-2.540)	(-2.552)	(1.560)	(1.590)
Constant	271.3***	283.9***	267.2***	280.4***	363.2**	260.3
	(4.219)	(4.275)	(5.418)	(5.370)	(2.143)	(1.462)
Observations	5126	5126	3292	3292	1362	1362
R-squared	0.551	0.551	0.469	0.470	0.530	0.527

Panel B. Domestic and Foreign Government Ownership Stake

	(1) 1990-2010	(2) 1990-2010	(3) 1990-2007	(4) 1990-2007	(5) 2008-2010	(6) 2008-2010
Domestic govt stake (%)	-0.432		-0.338		-1.086**	
	(-1.219)		(-0.818)		(-2.464)	
Foreign govt stake (%)		0.444		1.249*		-0.503
		(0.551)		(1.730)		(-0.595)
Rating	-431.0***	-432.1***	-360.1***	-359.9***	-533.0***	-538.1***
	(-6.760)	(-6.766)	(-4.785)	(-4.793)	(-5.591)	(-5.676)
Maturity	0.00351***	0.00344***	0.00737***	0.00726***	-0.00147	-0.00171
	(4.106)	(4.033)	(8.179)	(8.255)	(-0.850)	(-0.961)
Age	0.00287	0.00256	0.00342	0.00296	-0.000144	-0.00155
	(0.947)	(0.860)	(0.922)	(0.802)	(-0.038)	(-0.401)
Leverage	1.194*	1.142*	1.008*	0.912	5.784**	5.931**
	(1.796)	(1.735)	(1.722)	(1.546)	(2.078)	(2.130)
*Bank * Leverage*	-3.151***	-3.194***	-0.346	-0.351	-12.69***	-13.28***
	(-2.798)	(-2.800)	(-0.376)	(-0.360)	(-3.230)	(-3.390)
Bank	51.63**	50.48**	-11.82	-14.09	206.1***	210.4***
	(2.074)	(2.031)	(-0.581)	(-0.678)	(3.542)	(3.591)
Market-to-book	-17.31***	-17.47***	-8.813*	-8.657*	-26.12**	-25.29**
	(-3.455)	(-3.503)	(-1.757)	(-1.729)	(-2.148)	(-2.075)
Size	-16.25***	-15.65***	-11.00***	-10.29***	-16.05	-12.28
	(-3.552)	(-3.465)	(-3.051)	(-2.924)	(-1.550)	(-1.175)
ROE	-47.65**	-46.55**	-101.4**	-101.5**	63.64	65.76
	(-2.204)	(-2.117)	(-2.533)	(-2.517)	(1.394)	(1.433)
Constant	280.8***	275.8***	270.3***	263.2***	332.1*	242.4
	(4.307)	(4.265)	(5.285)	(5.354)	(1.842)	(1.372)
Observations	5126	5126	3292	3292	1362	1362
R-squared	0.551	0.551	0.469	0.470	0.528	0.527

Table 7. Junk bonds, domestic and foreign government ownership and the cost of debt.

Year fixed effects (v_t) regression analysis with heteroskedasticity-robust and firm-clustered standard errors is performed on the following model: y_{it} = $\alpha + \theta X_{it} + \gamma \hat{\zeta}_{it} + v_t + \eta_{it}$. The dependent variable, credit spread (y_{it}), is the difference between the corporate bond's current yield to maturity and that of the government bond most closely matched by maturity. α represents the intercept, and η_{it} is the error term. Orthogonalized values of the log of the bond's rating after conversion to an ordinal scale, **_Rating_** ($\hat{\zeta}_{it}$), are used. The explanatory variables included in X_{it} are described in Table 2. **_Bank * Leverage_** is an interaction of the variables described in Table 2, and **_Leverage_** is interacted with each of the government owner types. The data are annual and cover the period 1990-2010. The models control for bond collateral/instrument type, bond currency, and issuer country. Only observations using non-investment grade bonds are used in this table. Panel A looks at government presence, and Panel B uses government ownership stakes. Coefficients are listed below, with t-statistics in parentheses. *** denotes significance at the 1% level, ** denotes significance at the 5% level, and * denotes significance at the 10% level.

Panel A. Junk Bonds--Domestic and Foreign Government Ownership Presence

	(1)	(2)	(3)	(4)	(5)	(6)
	1990-2010	1990-2010	1990-2007	1990-2007	2008-2010	2008-2010
Domestic govt presence	-72.50*		-46.04		-133.0*	
	(-1.937)		(-1.010)		(-2.001)	
Foreign govt presence		143.2***		209.5***		143.1**
		(2.787)		(3.554)		(2.364)
Rating	-280.6**	-264.9**	-320.4***	-293.2***	-565.4***	-550.6***
	(-2.599)	(-2.551)	(-2.833)	(-2.667)	(-3.496)	(-3.684)
Maturity	-0.00146	0.000164	-0.00247	-0.00178	0.00786	0.0107
	(-0.303)	(0.035)	(-0.374)	(-0.270)	(0.958)	(1.320)
Age	0.00507	0.0101	0.0124	0.0145	-0.00741	0.00147
	(0.480)	(0.937)	(0.926)	(1.064)	(-0.487)	(0.105)
Leverage	9.644***	7.750**	11.42***	7.934***	11.75	8.711
	(2.723)	(2.463)	(3.109)	(2.802)	(0.649)	(0.540)
Bank * Leverage	6.326	1.198	7.512	-0.704	-119.8***	-117.7***
	(0.948)	(0.194)	(1.096)	(-0.097)	(-2.729)	(-2.793)
Bank	-290.4***	-174.8**	-280.6**	-135.6	875.5***	1009***
	(-2.869)	(-1.998)	(-2.008)	(-1.392)	(3.000)	(3.315)
Market-to-book	-53.30***	-47.66***	-69.40***	-59.55***	-38.55	-31.85
	(-2.761)	(-2.823)	(-3.399)	(-3.407)	(-0.681)	(-0.645)
Size	-19.88	-29.46*	-7.366	-16.33	-53.42	-65.63
	(-1.182)	(-1.720)	(-0.432)	(-0.940)	(-1.362)	(-1.633)
ROE	-50.57	-59.50	-104.8*	-107.4	185.8	155.5
	(-0.968)	(-1.268)	(-1.527)	(-1.696)	(0.817)	(0.746)
Constant	1568***	1740***	747.0***	864.8***	2229***	1949***
	(9.405)	(9.481)	(3.017)	(3.765)	(3.699)	(3.162)
Observations	732	732	450	450	255	255
R-squared	0.468	0.479	0.459	0.492	0.443	0.448

Panel B. Junk Bonds--Domestic and Foreign Government Ownership Stake

	(1)	(2)	(3)	(4)	(5)	(6)
	1990-2010	1990-2010	1990-2007	1990-2007	2008-2010	2008-2010
Domestic govt stake (%)	-2.080***		-0.906		-7.019***	
	(-2.703)		(-0.864)		(-5.520)	
Foreign govt stake (%)		1.417		4.242**		-2.981
		(1.106)		(2.433)		(-1.278)
Rating	-276.8**	-287.8**	-325.6***	-318.7***	-344.4**	-580.0***
	(-2.542)	(-2.599)	(-2.866)	(-2.816)	(-2.349)	(-3.418)
Maturity	-2.06e-05	0.000541	-0.00173	-0.00134	0.0101	0.00915
	(-0.004)	(0.115)	(-0.244)	(-0.197)	(1.304)	(1.106)
Age	0.00569	0.00631	0.0124	0.0103	0.00759	-0.00762
	(0.536)	(0.612)	(0.956)	(0.810)	(0.522)	(-0.514)
Leverage	9.679***	9.694***	11.63***	11.54***	6.568	5.474
	(2.718)	(2.761)	(3.040)	(3.094)	(0.426)	(0.314)
Bank * Leverage	6.490	4.614	5.178	5.590	-115.5***	-108.2**
	(1.025)	(0.703)	(0.748)	(0.783)	(-2.758)	(-2.577)
Bank	-300.3***	-255.8**	-249.6*	-258.1**	637.8**	917.8***
	(-3.056)	(-2.556)	(-1.991)	(-2.042)	(2.164)	(3.108)
Market-to-book	-52.09***	-51.66***	-69.25***	-69.47***	-57.74	-8.757
	(-2.707)	(-2.699)	(-3.325)	(-3.417)	(-1.111)	(-0.169)
Size	-19.79	-26.04	-6.358	-8.482	-38.20	-53.86
	(-1.188)	(-1.523)	(-0.370)	(-0.491)	(-1.152)	(-1.314)
ROE	-46.28	-47.35	-103.9	-100.5	141.5	154.2
	(-0.916)	(-0.925)	(-1.520)	(-1.484)	(0.680)	(0.701)
Constant	1564***	1644***	718.2***	783.4***	2010***	2750***
	(9.597)	(9.547)	(2.869)	(3.131)	(3.900)	(3.933)
Observations	732	732	450	450	255	255
R-squared	0.470	0.465	0.460	0.466	0.465	0.446

Table 8. Government ownership and the cost of debt: Alternative measures

Year fixed effects (v_t) regression analysis with heteroskedasticity-robust and firm-clustered standard errors is performed on the following model: $y_{it} = \alpha + \theta X_{it} + \gamma \hat{\zeta}_{it} + v_t + \eta_{it}$. The dependent variable, credit spread (y_{it}), is the difference between the corporate bond's current yield to maturity and that of the government bond most closely matched by maturity. α represents the intercept, and η_{it} is the error term. Orthogonalized values of the log of the bond's rating after conversion to an ordinal scale, **_Rating_** ($\hat{\zeta}_{it}$), are used. The explanatory variables included in X_{it} are described in Table 2. **_Bank * Leverage_** is an interaction of the variables described in Table 2, and **_Leverage_** is interacted with each of the government owner types. The data are annual and cover the period 1990-2010. The models control for bond collateral/instrument type, bond currency, and issuer country. Model 1 uses a banking crisis indicator based on Laeven and Valencia (2010). Model 2 interacts the presence of central government ownership with leverage. Models 3-8 compare the effects of government ownership presence and amounts among different state entities over during periods. Coefficients are listed below, with t-statistics in parentheses. *** denotes significance at the 1% level, ** denotes significance at the 5% level, and * denotes significance at the 10% level.

	(1) 1990-2010 Presence (Binary)	(2) 1990-2007 Presence (Binary)	(3) 1990-2010 Presence (Binary)	(4) 1990-2010 Stake (%)	(5) 1990-2007 Presence (Binary)	(6) 1990-2007 Stake (%)	(7) 2008-2010 Presence (Binary)	(8) 2008-2010 Stake (%)
Govt presence	39.34***							
	(3.168)							
Govt * Banking Crisis	-54.66*							
	(-1.966)							
Banking crisis	68.43***							
	(2.843)							
Central govt presence		17.71						
		(0.656)						
Central govt * Leverage		-1.904**						
		(-2.358)						
SWF			14.95	2.718*	71.67	4.111	32.49	1.461
			(0.667)	(1.939)	(1.378)	(1.586)	(1.439)	(0.627)
Central govt			-1.876	-0.745	-7.609	-0.689	-75.66**	-1.211**
			(-0.105)	(-1.471)	(-0.283)	(-1.112)	(-2.349)	(-2.473)
Local/regional govt			27.44	-0.0128	9.541	-0.189	-38.91	-0.35
			(1.509)	(-0.036)	(0.347)	(-0.317)	(-1.301)	(-0.654)
SOE full			7.918	-0.0353	19.06	0.977	18.59	-2.531**
			(0.487)	(-0.041)	(1.094)	(0.891)	(0.873)	(-2.086)
SOE mixed			10.3	-0.894*	36.37**	-0.0416	-90.39***	-2.231**
			(0.533)	(-1.835)	(2.272)	(-0.092)	(-2.755)	(-2.466)
Pension fund			67.49***	2.588	22.15	-6.470*	54.87	4.770***
			(4.304)	(1.086)	(1.276)	(-1.854)	(1.571)	(2.994)
Govt financial institution			21.71	9.171***	90.41	9.108*	86.04**	16.54***
			(0.744)	(2.666)	(1.644)	(1.915)	(2.363)	(3.187)
Rating	-434.4***	-369.9***	-428.3***	-426.4***	-356.4***	-356.4***	-530.0***	-535.0***
	(-6.880)	(-4.850)	(-6.812)	(-6.686)	(-4.922)	(-4.720)	(-5.322)	(-5.157)
Maturity	0.00361***	0.00735***	0.00337***	0.00340***	0.00715***	0.00716***	-0.000673	-0.000913
	(4.109)	(8.417)	(3.766)	(3.922)	(7.712)	(8.102)	(-0.375)	(-0.515)
Age	0.00333	0.00353	0.0037	0.00381	0.00315	0.0031	0.00177	0.000682
	(1.037)	(0.958)	(1.189)	(1.273)	(0.837)	(0.857)	(0.458)	(0.182)
Leverage	1.258*	1.221**	1.257*	1.316*	1.210**	1.043*	4.550*	5.616*
	(1.935)	(2.085)	(1.924)	(1.92)	(2.115)	(1.775)	(1.657)	(1.957)
Bank * Leverage	-3.628***	-0.107	-3.143***	-3.572***	-0.929	-0.165	-11.89***	-12.87***
	(-3.173)	(-0.132)	(-2.749)	(-3.281)	(-0.951)	(-0.179)	(-3.091)	(-3.291)
Bank	50.34**	-10.66	55.05**	56.91**	-4.899	-13.71	187.0***	225.1***
	(1.978)	(-0.540)	(2.181)	(2.391)	(-0.239)	(-0.650)	(3.213)	(3.809)
Market-to-book	-17.27***	-9.126*	-18.51***	-16.53***	-8.453*	-9.031*	-25.10**	-23.94*
	(-3.713)	(-1.801)	(-3.670)	(-3.295)	(-1.677)	(-1.789)	(-2.087)	(-1.825)
Size	-14.33***	-11.77***	-18.64***	-15.43***	-11.39***	-13.07***	-20.47*	-19.81*
	(-3.299)	(-3.411)	(-4.158)	(-3.544)	(-3.264)	(-3.444)	(-1.952)	(-1.860)
ROE	-39.07*	-102.9**	-42.03*	-44.39*	-97.56**	-98.09**	55.54	62.79
	(-1.848)	(-2.575)	(-1.872)	(-1.985)	(-2.578)	(-2.441)	(-1.257)	(-1.337)
Constant	263.8***	271.5***	302.5***	261.5***	298.0***	298.6***	403.3**	366.0*
	(4.192)	(5.31)	(4.589)	(3.957)	(4.83)	(5.529)	(2.196)	(1.937)
Observations	5126	3292	5126	5126	3292	3292	1362	1362
R-squared	0.558	0.477	0.553	0.553	0.48	0.474	0.536	0.536