The Value of Government Ownership during the Global Financial Crisis

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Abstract: This paper examines the value of government ownership in Europe before and during the Global Financial Crisis, taking into account the level of investor protection and country corruption as measures of the risk of expropriation by the government. Using a unique sample of 5,070 listed firms in 29 European countries over the period 2005-2009, we find that government ownership significantly increased firm value and stock returns *during* the crisis. The positive effect of government ownership was driven by firms located in countries with good investor protection and low corruption. Firms with government ownership were also able to invest more during the crisis, indicating that government ownership reduced financing constraints for firms during the crisis. Our results suggest that the positive effect of government guarantees in alleviating financial supply shocks outweighed the negative effects of agency costs associated with government ownership during a crisis period. Our results also suggest that government ownership can help overcome crisis shocks only in an environment with low risk of expropriation by the government.

Keywords: Corporate Governance, Government Ownership, Financial Crisis, Firm Value, Investments

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INTRODUCTION

In the wave of privatization that began in the United Kingdom in the 1980s and spread across the globe during the 1990s, governments all over the world have sold large blocks of their ownership positions to the private sector (Megginson & Netter, 2001). However, government ownership of publicly-traded companies remains pervasive around the world, and the debate of government involvement in public companies has been reopened on the verge of the recent Global Financial Crisis. This is particularly relevant since governments in many industrialized, market-oriented economies worldwide have been taking on equity stakes as part of rescue packages (Nanto, 2009; The Economist 2012).

A number of studies have investigated the role of government share ownership, but the empirical evidence on the economic outcome is mixed. Government ownership is often viewed to be detrimental to firm value. Government ownership and the corresponding implicit government debt guarantees may increase moral hazard for managers and impose social and political goals that reduce corporate profitability (Borisova, Fotak, Holland, & Megginson, 2012). In a similar vein, Shleifer and Vishny (1994) argue that state owned enterprises are a mechanism for pursuing the individual goals of politicians, such as maximizing employment or financing favored enterprises. The government is believed to have a "grabbing hand" that extorts firms for the benefit of politicians and bureaucrats (Shleifer & Vishny, 1998). In sum, political pressures may lead government investment vehicles to pursue goals other than value maximization. There is ample

empirical research supporting the proposition that government ownership is less profitable than private ownership (e.g., Megginson & Netter, 2001; Estrin, Hanousek, Kocenda, & Svejnar, 2009).

In contrast, other studies suggest that government ownership may also have a positive effect on firm performance. Government ownership can help firms to cope with external uncertainties (Agrawal & Knoeber, 2001; Hillman, Withers, & Collins, 2009; Pfeffer & Salancik, 1978), and can facilitate access to financial resources such as bank loans (Khwaja & Mian, 2005; Faccio, 2006), which ultimately increases the value of firms and/or improves firm performance. Governments can provide implicit and explicit guarantees to secure debt financing (Borisova & Megginson, 2011; Borisova, Fotak, Holland, & Megginson, 2012). Borisova and Megginson (2011) find that high government ownership decreases the cost of debt, as the government's presence could provide implicit guarantees for repayment and protection against bankruptcy. This may be particularly true in transitional economies. Tian and Estrin (2008), for instance, show that when its shareholding stake in a firm is large, the Chinese government can substantially help firms through a wide range of preferential treatments.

In this study, we contribute to this debate by analyzing the effect of government ownership on firm value during the Global Financial Crisis of 2008-2009. We focus on this crisis for several reasons. First, the Global Financial Crisis represents an exogenous shock, which allows us to observe an out-of-equilibrium effect with regard to firm value by the adjustments in valuation by outside shareholders during the crisis period (Lins, Volpin & Wagner, 2011). Second, the relation between government ownership and firm value is likely to be contingent on government incentives to either support firms or

rather to expropriate firm value. The financial crisis offers a natural experiment in which we can triangulate the net positive effect of government ownership on firm value. The crisis may have induced governments to forego short-term political incentives of diverting firm resources, while the access to external finance that government ownership may bring is likely to be especially relevant during a negative financial supply shock such as the recent crisis, thereby significantly increasing the value of government ownership.

Furthermore, since the quality of institutional environment is an important factor in firm value (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998), we expect that country-level corporate governance will impact the benefits and costs of government ownership during a financial crisis. The financial crisis could make corporate governance pivotal, because investors give more value to institutional protection for their investments during crisis periods (Rajan & Zingales, 1998). Therefore, we can more powerfully assess the importance of country-level corporate governance for the effects of government ownership during a financial shock. We expect that the benefits of government ownership during a crisis are more likely to outweigh the costs in countries with strong institutions and low corruption, where the risk of expropriation by the government is low.

Throughout the study, we are mindful of the possible influence of endogeneity on our empirical results. Prior studies on government ownership and firm performance potentially suffer from endogeneity problems because ownership structures and firm value may be jointly determined (Demsetz & Lehn, 1985; Demsetz & Villalonga, 2001; Himmelberg, Hubbard, & Palia, 1999; Holderness, Kroszner, & Sheehan, 1999).

Because the global financial crisis represents an *exogenous shock*, it allows us to reduce endogeneity concerns resulting from reverse causality or omitted variable bias. We additionally try to reduce endogeneity concerns by considering the effect of government ownership in 2006, i.e. *before* the start of the crisis, on firm value in the crisis years 2007, 2008 and 2009. Using government ownership in 2006 allows us to avoid the effect of potential changes in government stakes in response to firm value changes or from bail-out activities during the crisis. At the same time, it is very unlikely that government ownership in 2006 reflects the unexpected crisis effect on performance. Second, we mitigate the omitted variable problem by using a panel data framework with firm fixed effects. Himmelberg, Hubbard, and Palia (1999) show that unobserved heterogeneity across firms can generate a spurious correlation between ownership and performance. By using firm fixed-effects we account for unobserved time-invariant firm-specific factors and exploit only the effect of within-firm variation of government ownership on firm value.

Our analysis is based on a unique sample of 5,070 listed firms in 29 European countries for which we have information on government ownership in each year of the period 2005-2009. First, we estimate panel regressions in which we model the market-to-book ratio as a function of government ownership at the end of 2006, distinguishing between the crisis years and pre-crisis years. We find that while government ownership had a negative impact on firm value before the crisis, this association reverses to a positive effect in 2007, 2008 and 2009. When we investigate the determinants of stock returns during the crisis period, we also find that firms with government ownership experienced substantial positive abnormal stock returns over the crisis period. Interestingly, the positive effect of government ownership on firm value and stock returns during the

crisis period is only found for firms located in countries with high institutional quality and low corruption.

We further examine the channel through which government ownership might affect the firm valuation during the crisis period by considering the impact of government ownership on the firm-specific level investments during the crisis. We hypothesize that the guarantee provided by government ownership reduces financing constraints, and as a result makes it easier for firms to undertake investments. Consistent with our hypothesis, we find that *during* the financial crisis the level of government ownership was significantly and positively related to firm capital expenditures. Also here, this positive effect is only observed in countries with high investor protection and strong institutions, suggesting that a sufficient level of institutional quality is required to have government ownership increase investments during a crisis period.

Our study contributes to the literature in several ways. First, while Borisova and Megginson (2011) and Borisova, Fotak, Holland, and Megginson (2012) find that government ownership helps stabilize a firm's cost of debt financing in 2008-2010, we are – to the best of our knowledge – the *first* to investigate the impact of government ownership on firm value during the Global Financial Crisis. We show that government ownership positively impacts firm value, stock returns and capital investments during a crisis when the risk of expropriation by the government is sufficiently small. Second, we add to the literature on country-level institutional quality by providing evidence that the positive effect of government ownership during a crisis particularly occurs in an institutional environment where the risk of investor expropriation by governments is small. An important policy contribution of our study is that in a poor institutional setting,

government participations in firms do not seem to convince investors and may therefore lack the power to provide a necessary boost to local economies during an economic crisis.

The remainder of our study is organized as follows. In the following sector, we provide a brief literature review and develop our hypotheses. Then, we describe the sample and variables used in the paper, and provide descriptive statistics. Next, we present the empirical evidence. The final section concludes the paper.

RELATED LITERATURE AND HYPOTHESES

The effect of government ownership on firm value is a controversial topic. As a shareholder, the government can use its voting rights to influence business decisions. Managers of state owned enterprises (SOEs) could therefore be induced to pursue government leaders' political objectives, rather than strive for profit maximization (Shleifer & Vishny, 1994). This political interference in SOEs is often assumed to be detrimental to firm value for several reasons. First, the government may use its influence on the company to try to maximize social welfare rather than firm profits, which are only a component of social welfare. The government may refrain from profit maximizing policies when these have negative external effects on social welfare, for example when profit maximizing policies involve the abuse of market power (Vickers & Yarrow, 1991). Furthermore, the government may be pressured by specific interest groups to direct the behavior of SOEs to enhance the welfare of these interest groups, such as labor unions (Bennedsen, 2000; Laffont & Tirole, 1991). This could for example take the form of jobs in the SOE at above-market wages or even outright value

transfers via the sale of the firm's assets or products at artificially low prices to related interest groups (Boycko, Shleifer, & Vishny, 1996; Laffont & Tirole, 1991; Shleifer, 1998). Politicians may also abuse their power to derive personal benefits from SOEs, at the expense of the firm (Shleifer, 1998). For example, SOEs may produce goods desired by the politicians rather than by consumers, or they may be asked to locate their production in politically desirable rather than economically attractive regions (Shleifer & Vishny, 1994). Furthermore, the benefits that politicians get from SOEs provide them with an incentive to reduce risky yet value-enhancing investments in order to safeguard their personal benefits (John, Litov, & Yeung, 2008).

Government ownership may also reduce firm value due to "soft" budget constraints. Since the government is unlikely to allow SOEs to go bankrupt, the discipline enforced on private firms by capital markets and the threat of financial distress matters less for SOEs (Laffont & Tirole, 1991; Megginson & Netter, 2001; Schmidt, 1991). Since political fortunes are typically not sensitive to the performance of SOEs, the incentives of politicians to monitor the managers of SOEs are rather poor anyway, leaving managers considerable discretion to pursue their own agendas (Vickers & Yarrow, 1991). Managers of SOEs from their side may also decide not to pursue profitable investments, because once the investments are sunk, the government may reallocate these investments for unrelated investment purposes (Laffont & Tirole, 1991).

Several empirical studies (e.g., Dewenter & Malatesta, 2001; Gupta, 2005; Megginson, Nash, & Randenborgh, 1994) support the political interference hypothesis. For example, Boardman and Vining (1989) compare the accounting performance of private firms, SOEs, and partially privatized firms among the 500 largest non-US industrial firms.

They find that SOEs and partially-privatized firms perform substantially worse than fully privatized firms. Boubakri, Cosset, and Guedhami (2005) document a significant increase in post-privatization profitability, efficiency, investment and output for a sample of 230 firms in 32 developing countries. They also find that control relinquishment by the government is a key determinant of profitability, efficiency gains and output increases following privatization.

While the impact of government ownership on firm value is often assumed to be negative, government ownership may also be positively related to firm value. The arguments listed above imply that politicians, interest groups, and/or society at large derive benefits of government ownership at the expense of the firm. However, resource dependency theory argues that firms establish connections to politicians to cope with external uncertainties (e.g., Hillman, Withers, & Collins, 2009; Pfeffer & Salancik, 1978), suggesting that firms may actually derive benefits from government ownership. In general, government actions can be an important source of uncertainty for firms. Being connected with politicians via government ownership therefore can give firms an information advantage about changes or disruptions in the policy-making process, helping them to anticipate and effectively adapt to such changes. These connections can also shield them from market uncertainties stemming from actions undertaken by competing firms; from restrictive access to finance; or even from the rise of new, risky industries (Rajan & Zingales, 2003).

Furthermore, the guarantees associated with government ownership can provide firms with a better access to finance. Governments can arrange *explicit* guarantees on the debt of a firm, increasing the likelihood for firms to obtain loans. Since governments have

deep pockets, they can also provide *implicit* guarantees that firms with government ownership will not default (Borisova & Megginson, 2011; Borisova, Fotak, Holland, & Megginson, 2012). A government ownership stake may also signal the government's commitment to bailout the firm in times of an economic distress. Evidence consistent with these claims is observed in several settings. Brandt and Li (2003) find that Chinese state-owned enterprises are more likely to obtain bank loans than private enterprises. Additional evidence consistent with the debt guarantee argument is found in a large body of international work suggesting that politically-connected firms have greater access to bank financing than non-connected firms (e.g., Charumilind, Kali, & Wiwattanakantang, 2006; Khwaja & Mian, 2005; Sapienza, 2004; Fan, Rui, & Zhao, 2008). The government can also provide preferential business treatment, such as large product orders or even direct government subsidies (Tian & Estrin, 2008) to prevent the company from bankruptcy. Faccio, Masulis, and McConnell (2006) find that politically-connected firms are more likely to be bailed out than their non-politically connected peers. Moreover, they show that connected firms can get loans with weaker loan requirements and more favorable interest rates.

We can therefore identify at least two channels in the literature through which government ownership can impact firm value during a financial crisis. First, government guarantees might become more valuable when firms face a higher likelihood to fail, which is the case in economic crisis periods (Ivashina & Scharfstein, 2010; Puri, Rocholl, & Steffen, 2011; Santos, 2011). Second, crisis periods may induce governments to forego short-term political incentives of diverting firm resources, since such actions may result in more bankrupt firms and eliminate the ability to expropriate firm assets in the future (Lins, Volpin, & Wagner, 2011). While the results of prior

work lead us to expect that government ownership had a negative impact on firm value in non-crisis periods, both arguments lead us to hypothesize that the financial crisis increased the value of government ownership. This results in our first hypothesis:

H1: The value of government ownership for firms increased during the Global Financial Crisis in 2008-2009.

The impact of government ownership on firm value during a crisis is likely to depend on the quality of the institutional environment in which the firm operates. Weak institutions and poor investor protection make it easier for any controlling shareholder to expropriate firm value. For example, Renders, Gaeremynck, and Sercu (2010) find that firms in European countries with better investor protection tend to have better corporate governance ratings. In these countries, firm-level corporate governance matters less for firm performance[1]. Furthermore, it is well documented that the quality of the institutional environment influences government expropriation-related incentives (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998; Shleifer, 1998; Borisova, Brokman, Salas, & Zagorchev, 2012). In countries with weaker institutions, government ownership is more likely to be motivated by politicians' agendas rather than by social objectives. Borisova, Brokman, Salas, and Zagorchev (2012) find that government ownership is negatively related to governance quality of firms in civil law countries, but it is positively related to governance in common law countries. As argued by Rajan and Zingales (1998) and Johnson, Boone, Breach, and Friedman (2000), a financial crisis makes protection of investors from expropriation even more pivotal. Falling expected returns on investment increase the incentives for controlling shareholders and managers to expropriate, and a crisis may force investors to realize that their investments are not

adequately protected. Consistent with this argument, investor protection in a country (Johnson, Boone, Breach, & Friedman, 2000) and the quality of firm-level corporate governance (Mitton, 2002) have been found to have a strong impact on firm performance during the 1997 crisis in East-Asia.

High quality institutions and strong investor protection help to reduce political distortions because they grant investors more power to protect their rights, making it also more difficult for governments to intervene in firm's operation and decision making. Therefore, in countries with low institutional quality and poor investor protection, the risk of expropriation by the government is expected to be higher. Furthermore, in these countries government ownership is more likely to be driven by personal, political objectives of politicians rather than by welfare maximizing objectives. Consequently, the predicted positive effect of government ownership on firm value during the crisis may be reduced by a high expropriation risk. Therefore, we expect the positive effect of government ownership during the crisis to be weaker in countries with weak institutions and poor investor protection. We formulate our second hypothesis as follows:

H2: The positive effect of government ownership on firm value during the Global Financial Crisis periods (2008-2009) is less pronounced in countries with weak institutions and poor investor protection.

DATA AND VARIABLES

Data

We gather time-series ownership data (2004-2009) for all listed companies included in the yearly tapes (December issues) of the *Amadeus* ownership database of *Bureau van Dijk.* Because the Amadeus ownership database uses different sets of shareholder categories before and after 2004, we use a sample starting in 2004 to avoid any potential bias due to the differences in shareholder classification. For each company we observe at least once during the 2004-2009 period, we identified all shareholders for each year during the observation period. *Amadeus* reports total ownership and direct ownership of each shareholder. Total ownership is based on both direct and indirect shareholdings, i.e. via other firms. For this study we use data on total ownership. When total ownership is missing but direct ownership data are available, direct ownership is used. On the basis of ownership categories reported in *Amadeus,* we then identified the *State, Public authority* category as government shareholders. In addition, shareholders whose name contained terms such as *Ministry, State of Government, Treasury, and Council,* were also identified as government shareholders. For companies with more than one government shareholder in one year, we used the sum of these shareholders' total ownership as the government ownership for that year. Our ownership database consists of 51,998 firm-year observations for 16,283 firms.

Next, we selected firms with available accounting and stock price information on the intersection of the *Amadeus* financial and ownership files. This resulted in a reduced sample of 43,927 firm-year observations from 12,576 firms. In a next selection step, we

restricted our sample to observations with data available to calculate the main control variables. This yields a sample of 28,971 firm-year observations pertaining to 7,388 individual firms. Requiring lagged values and the 2006 value for government ownership further reduces the total number of observations to 19,331 (5,070 unique firms). This sample selection process does not suffer from survivorship bias because if a firm delists or goes bankrupt in a specific year, the firm-year observations which have been identified by us prior to the year of delisting or bankruptcy remain in the sample.

Government Ownership and Institutional Quality

In the empirical analysis, we use two different measures of the impact of government ownership. The dummy variable *GovDummy* captures the government presence. It takes the value of 1 if the firm has government ownership over 5 percent and 0 otherwise. The continuous variable *GovPercentage* measures the level of government ownership. *GovPercentage* is the proportion of state-owned shares to total shares. We eliminate government ownership below 5%, because in some countries included in our sample, such as France or Belgium, listed firms are not obliged to report ownership below 5%. Furthermore, government ownership at very small levels is more likely to reflect passive holdings by sovereign wealth funds, which are unrelated to our hypotheses.

Institutional quality is measured in different ways. First, we use the yearly control of corruption index from the World Bank, which measures "*the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests*" (Kaufmann, Kraay, & Mastruzzi, 2010). The index ranges between -2.5 and 2.5, with higher values

corresponding to better governance outcomes[2]. We measure investor protection in a country by the anti-director rights index of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), updated by Martynova and Renneboog (2010) for the year 2005. As an alternative measure of investor protection we also used the corrected anti-director rights index (2005 values) from Spamann (2010). The results for the Spamann index (available from the authors) are very similar to those for the anti-director rights index reported in the paper, but they are based on a smaller number of observations, because the Spamann index is not available for 15 countries in our sample.

Table 1 provides information on the country distribution of observations. The sample includes firms from 29 countries. Three countries together represent more than 50 percent of all the observations: the United Kingdom (32.21%), Germany (13.44%) and France (12.72%). 818 observations have block government shareholdings over 5%. The largest number (120) is in the United Kingdom, followed by Poland and Sweden. For the overall sample, the mean percentage of government ownership of firms with government blockholdings is 21.67%, and tends to be high in Eastern European countries such as Lithuania (78.31%), Czech Republic (68.21%), Croatia (55.24%) and Slovenia (51.00%). The control of corruption measure of 2009 is negative for Russia only, implying that all other countries in our sample in 2009 had a score above the worldwide mean of zero. With respect to the anti-director rights index, values range between 0 (Luxembourg) to 4 (Croatia, France, Italy, and Slovenia).

Insert Table 1 about here

Table 2 reports the year by year distribution of government ownership in our sample. During the period of study, governments held shares in 4.23% of all observations in the sample. The noticeable increase in the proportion of observations with government ownership in the year 2007 and 2008 illustrates the significant government intervention during the financial crisis years. Interestingly, government ownership quickly returns back to pre-crisis levels in 2009. The interval breakdown of the sample shows that the increases in firms with government ownership stakes during 2007-2008 are mainly attributable to the observations with small government stakes (i.e., below 20 percent). This suggests that governments mainly took minor equity participations in listed firms during the financial crisis and only nationalized a small minority of private firms (117 out of 19,331 or 0.61 percent of the sample).

Insert Table 2 about here

Other Variables

In the main analysis, we measure firm value by the market-to-book ratio (*Market/Book*). *Market/Book* is calculated as (market value of equity + book value of debt)/ (book value of assets), where the market value of equity is the market capitalization at the year end. To reduce the impact of outliers, we take the natural logarithm to generate our main dependent variable *LnMarket/Book*. We also examine stock returns during the crisis period (*Return*) as an alternative measure of firm value. We define the crisis period as from July 16, 2007 to March 9, 2009, when the Stoxx Europe 600 Index declined from

the peak of 399.71 to the trough of 157.97. *Return* is the cumulative buy-and-hold stock return over this crisis period. We will also consider the impact of government ownership on investments during the period considered. *Investment* is calculated as (Fixed Assets at the end of year *t* - Fixed Assets at the end of year *t-1* + Depreciation in year *t*)/Total Assets (book value) at the end of year *t*, and is winsorized at the 1st and 99th percentiles.

We include three ownership dummy variables to control for the impact of other block shareholders. *INDUSTRIAL* takes the value of 1 if there are block shareholdings over 5 percent by industrial companies, and 0 otherwise. *FAMILY* takes the value of 1 if there are block shareholdings over 5 percent by family or individual owners, and 0 otherwise. *INSTITUTIONAL* takes the value of 1 if there are block shareholdings over 5 percent by banks, mutual funds, insurance, private equity or financial companies, and 0 otherwise.

The following firm-level measures can potentially affect firm value and investments and are used as control variables. We include *LnAssets*, defined as the natural log of total assets (in thousands euro) to control for firm size. Large firms may realize scale economies and have better access to bank credits, which could improve corporate profitability and consequently also firm valuation (e.g., Dewenter & Malatesta, 2001; Maury, 2006). Following Lemmon and Lins (2003) and Sun and Tong (2003), we include *Leverage*, measured as the ratio of total liabilities to total assets, to control for any possible leverage effect (e.g., McConnell & Servaes, 1995; Kang & Stulz, 1996). We also include *FixedAssets* to capture a firm's growth opportunities (e.g., Morck, Shleifer, & Vishny, 1988; Tian & Estrin, 2007). *FixedAssets* is calculated as the ratio of fixed assets over total assets. *CashFlow*, which is the ratio of operating income before

depreciation to total assets, is included to control for the effect of internal funds availability on investments (e.g. Cho, 1988; Duchin, Ozbas, & Sensoy, 2010).

Table 3 provides descriptive statistics and the Pearson correlation matrix for our main variables. The government ownership measures are negatively correlated with the market-to-book ratio, but positively correlated with the crisis period returns and investments. All the correlation coefficients between the control variables are below 0.35, and all Variance Inflation Factors are below 2.5, indicating that multi-collinearity is not a concern in the multivariate analyses.

Insert Table 3 about here

Table 4 compares financial characteristics and ownership characteristics of firms with and firms without block government ownership. Panel A reports the financial characteristics for all the firm-year observations during the sample period of 2005-2009, except for *Return,* which is based on 3,441 firm-observations for the crisis period from July 16, 2007 to March 9, 2009. Firms with government ownership are larger (measured by total assets), have a higher portion of fixed assets and generate more cash flow. Over the full period 2005-2009, firms with government ownership have a smaller market-to-book ratio than other firms (1.38 versus 1.58). However, their stock price declined significantly less during the crisis (-0.53 versus -0.59). Panel B of Table 4 reports share blockholdings as of the end of 2006. Firms with government ownership were less likely to have industrial blockholders (62 percent versus 67 percent) and more likely to have

institutional blockholders (73 percent versus 78 percent). They are much less likely to have family blockholders (15 percent versus 46 percent).

Insert Table 4 about here

EMPIRICAL ANALYSIS

Government Ownership and Firm Value

To test our hypotheses, we first estimate the following general model:

$$\text{LnMarket / Book}_{it} = \alpha_i + \alpha_1 \text{GovOwn}_{it-1} + \alpha_2 \text{GovOwn06}_i * \text{Crisis}_t + \alpha_3 \text{X}_{it} + \alpha_t \text{Year}_t + \varepsilon_{it} \quad (1)$$

Where *LnMarket/Book*$_{it}$ is the natural logarithm of market-to-book ratio of total assets of firm *i* at the end of year *t*. *GovOwn*$_{it-1}$ represents the government ownership variables of firm *i* in year *t-1*. *Crisis*$_t$ is a vector of dummies indicating the year 2007, 2008 and 2009. Since our main interest is the impact of government ownership, we use the interaction term between *GovOwn at the end of 2006 (GovOwn06)* and the 2007, 2008 and 2009 year dummies to capture the effect in each year during the crisis. X_{it} comprises a set of firm-specific control variables (*LnAssets*, *Leverage*, *FixedAssets*). All non-binary variables except Ln*Market/Book*, *LnAssets*, and GovOwn are winsorized at the 1st and 99th percentiles to mitigate the impact of outliers.

As documented by Cho (1998), Demsetz and Lehn (1985) and Demsetz and Villalonga (2001), studies on ownership and firm performance may suffer from endogeneity

problems. It could be argued that government ownership and performance are determined simultaneously: if a large company performs poorly, the government might take an equity stake or increase its equity stake to prevent the company from going out of business, to maintain employment, or for some other reason. To address this concern, we consider the effect of government ownership *in 2006* on performance during the crisis years 2007, 2008 and 2009, to avoid the potential changes in government stakes in response to firm value changes during the crisis. It is very unlikely that the government ownership *before* the crisis will reflect the effect of the crisis.

Since Himmelberg, Hubbard, and Palia (1999) show that unobserved heterogeneity across firms can generate a spurious correlation between ownership and performance, we use panel data regressions with firm fixed effects. A Hausman test indicates that the use of firm fixed effect is most appropriate. We also include year dummies $Year_t$ to control for year effects. Standard errors are heteroskedasticity-consistent and clustered at the country level and the firm level.

Table 5 reports regression results on the impact of government ownership on firm value as measured by $LnMarket/Book_{it}$. In the first two regressions, we consider the effect of government block ownership measured by *GovDummy*. In regression 1, lagged government ownership is not significantly related to firm value. However, the coefficients of the interaction variables *GovDummy06*2007, GovDummy06*2008* and *GovDummy06*2009* are all positive and significant at least at the 5% level, which suggests that the value of government ownership significantly increased during the crisis years. This is consistent with our hypothesis that the implicit guarantees from government ownership become more valuable during a crisis, and that a crisis might

induce governments to forego short-term political incentives of diverting firm resources. All control variables are statistically significant at the 0.1% level.

Regression 2 takes into account the potential effect of the presence of other types of blockholders. The effect of government blockholdings during the crisis years remains positive and significant even after controlling for other block shareholders. While blockholdings of industrial companies tend to be positively related with firm value during the crisis years, shareholdings by institutional owners are negatively correlated with firm value during the crisis years. We do not find a significant effect of family blockholdings.

To test whether the proportion of government ownership matters, we include the percentage of government ownership in regressions3-4. Consistent with the results regarding *GovDummy* in regressions 1-2, the coefficients of all interactions on *GovPercentage06* are positive and significant at the 5% level or higher. These results imply a significant positive impact of government ownership, expressed both as a binary indicator of presence and as a percentage stake in a firm, on firm value during the crisis period.

Given the possibility that the influence of government shareholding on corporate value is non-monotonic (e.g, Tian & Estrin, 2008; Borisova & Megginson, 2011), we include the natural logarithm of *GovPercentage_lag* in regression 5 and the squared term of *GovPercentage_lag* in regression 6. Neither coefficient of *LnGovPercentage_lag* and $GovPercentage\_lag^2$ is significant, indicating that there is no non-monotonic relationship between government ownership and firm value.

Insert Table 5 about here

Government Ownership and Stock Returns during the Crisis

Our analysis so far has focused on the market-to-book ratio as a proxy of firm performance. In this section we consider cumulative stock returns during the crisis period as an alternative measure. A large body of research has used cumulative stock returns during a crisis as these reflect the change in value during the crisis period (e.g., Mitton, 2002; Lemmon & Lins, 2003; Lins, Volpin, & Wagner, 2011). We estimate the following cross-sectional OLS model to test the effect of government ownership on the cumulative buy-and-hold return from July 16, 2007 to March 9, 2009, when the Stoxx Europe 600 Index declined from the peak of 399.71 to the trough of 157.97:

$$\mathrm{Re}turn_{\mathrm{i}} = \alpha_0 + \alpha_1 \mathrm{GovOwn06}_{\mathrm{i}} + \alpha_2 \mathrm{X}_{\mathrm{i}} + \varepsilon_{\mathrm{i}} \qquad (2)$$

Following Mitton (2002), Lemmon and Lins (2003), Lins, Volpin, and Wagner (2011), we use four control variables that are plausibly related to differences in risk across firms. *LnAssets*, *Leverage* and *Market/Book* are defined as before. In addition, we include a new risk control *Beta*. *Beta* is computed by regressing a firm's monthly stock returns in the pre-crisis period on the corresponding country index returns from Datastream using the Dimson (1979) method. Again, we measure the government ownership and control variables at the end of 2006, i.e. before the start of the crisis, to avoid any spurious correlation between these variables and stock returns during the crisis.

Insert Table 6 about here

Regression results are reported in Table 6. In regression 1, the coefficient of *GovDummy06* is 0.09 and significant at 1% level, indicating that ceteris paribus, stock returns of firms with a government blockholding were 9% higher than stock returns of firms without a government blockholding. The coefficient of *GovDummy06* remains positive and significant after controlling for the dummies of other block shareholders in regression 2. The positive effect of government ownership also holds when we consider the level of government ownership in regressions 3-4. After controlling for other blockholders, the coefficient of *GovPercentage06* is 0.22 and significant at the 1% level (regression 4), suggesting that an increase of one percentin government ownership is associated with an increase of twenty-two percentage points in the crisis period return. We examine the non-monotonic models in regressions 5-6 and again find no significant effect of *LnGovPercentage06* and $GovPercentage06^2$. Consistent with other studies on crisis returns, we also find that *Beta* is negatively related to stock returns in all the regressions: during a financial crisis, high risk firms tend to perform worse. In summary, the results inTable 6 indicate that stock returns during the crisis were higher when firms had government ownership and increased with the level of government ownership, confirming our hypothesis H1 and previous results.

Institutional Quality and the Value of Government Ownership

In this section we consider whether institutional quality matters for the effect of government ownership (H2). To conduct this investigation, we split our sample into three subsamples based on the control of corruption indicator of the World Bank, and three subsamples based on the anti-director rights index of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), updated by Martynova and Renneboog (2010) for the year 2005. With respect to control of corruption, we split the sample based on the tertiles of the control of corruption score. Observations for country-years in which control of corruption is in the lower (upper) tertile are classified into the low (high) institutional quality subsample; observations for country-years whose control of corruption value is in the middle tertile are classified into the middle subsample. The low subsample includes: Czech Republic (2006-2009), Croatia, Greece, Hungary (2009), Italy, Latvia, Lithuania, Poland, Russia, Slovakia (2006-2009). The middle subsample includes: Belgium, Czech Republic (2005), Estonia, Hungary (2005-2008), Ireland (2005, 2006, 2007, 2009), Luxembourg (2005), Portugal, Slovakia (2005), Slovenia, Spain, Germany (2007-2009), France, United, and Kingdom (2007-2009). The high subsample includes: Austria, Denmark, Finland, Germany (2005-2006), Iceland, Ireland (2008), Luxembourg (2006-2009), the Netherlands, Norway, Sweden, Switzerland, and the United Kingdom (2005-2006). With respect to the anti-director rights index, Low investor protection countries are countries with a score of 0 or 1, while high investor protection countries have score of 3 or 4. Countries with a score of 2 are in the middle subgroup (cf. Table 1).

Table 7 reports results on the impact of the percentage government ownership at the end of 2006 on firm value, for control of corruption (regressions 1-3) and for the anti-director rights index (regressions 4-6). We find that for the subsample with a low control of corruption score (i.e., countries with relatively high corruption), only the coefficient of *GovPercentage06*2009* is marginally positive, which is in consistent with the hypothesis that the crisis effect of government ownership is weak or nonexistent when institutional quality is poor. The coefficients of *GovPercentage06*2008* and *GovPercentage06*2009* are positive and highly significant at the 0.1% level for the middle subsample, and the coefficient of *GovPercentage06*2009* is also positive and significant in the high subsample. With respect to the anti-director rights index, we find that while there is no significant effect of government ownership in the low investor protection sample, all the coefficients of *GovPercentage06*2007*, *GovPercentage06*2008* and *GovPercentage06*2009* are positive and significant in both the middle and high investor protection samples. Overall, these results support our second hypothesis that the positive effect of government ownership on firm value during the crisis is more pronounced in countries with good institutional quality, suggesting that investors value government ownership more during the crisis in countries where there is a low risk of government expropriation.

Insert Table 7 about here

In Table 8, we consider the impact of institutional quality on the effect of government ownership on crisis period returns. Regressions 1-3 are again based on the control of

corruption subsamples and regressions 4-6 are based on the anti-director rights subsamples. The coefficients of *GovPercentage06* are positive and significant in subsamples with middle or high control of corruption, and in the subsample with high anti-director rights index. Again, these results confirm that the positive effect of government ownership on returns is less pronounced in countries with poor investor protection and weak institutions. These findings are also consistent with the results of Lemmon and Lins (2003) and Johnson, Boone, Breach, and Friedman (2000), who find that firms in countries with stronger corporate governance performed better than firms in countries with weak corporate governance in the 1997 Asian Financial Crisis.

Insert Table 8 about here

Government Ownership and Investments

One possible channel of the positive effect of government ownership on firm value is that it provides firms with a greater capacity to undertake long-term investments (Lazzarini & Musacchio, 2011). Because government guarantees can alleviate capital constraints through easier access to finance, the investments of firms with government ownership are potentially less affected by the crisis than firms without government ownership. Therefore, we expect a positive effect of government ownership on investments during the crisis years. To test the hypothesis, we use the following model:

$$\text{Investment}_{it} = \beta_i + \beta_1 \text{GovPercentage}_{it-1} + \beta_2 \text{GovPercentage06}_i * \text{Crisis}_t + \beta_3 X_{it} + \beta_t \text{Year}_t + \varepsilon_{it} \quad (3)$$

where $Investment_{it}$, $GovPercentage_{it-1}$, $Crisis_t$ and $Year_t$ are defined as before. X_{it} is a set of firm-specific control variables, which includes *LnAssets, Market/Book* and *CashFlow*. We include a firm fixed effect β_i to control for time-invariant differences across firms. Year dummies are again included to capture time effects. Standard errors are heteroscedasticity-consistent and clustered at the country level and the firm level.

Insert Table 9 about here

In Table 9, we report estimation results of model (3) for the full sample (regression 1), and then for subsamples based on the control of corruption score (regressions 2-4) and the anti-director index (regressions 5-7). Not surprisingly, the results show a general, significant decline in investments from 2007 onwards: the 2007, 2008 and 2009 dummies have significant negative coefficients in all regressions. However, for the full sample we do find a significant (at the 1% level) and positive coefficient of the interaction between the 2009 dummy and government ownership as measured by *GovPercentage06* (regression 1), supporting our prediction that government ownership helps to support firm investments during a financial crisis. When taking into account the institutional quality, we also find a significant and positive effect of government ownership on investments in 2008 and/or 2009 for the subsamples with middle and high control of corruption/anti-director index (regressions 3, 4, 6, and 7). Interestingly,

regressions 2 and 5 indicate that investments during the crisis were even lower for firms with government ownership, located in countries with poor institutional quality. These findings further support our hypothesis that the support of government ownership during the financial crisis was weaker in countries with weak institutions and poor investor protection.

Robustness Tests

We ran a number of robustness tests to confirm the results reported in this study. All results are available from the corresponding author upon request. First, because financial firms have different capital structures and generally receive higher levels of government support compared to non-financial firms in case of distress, we exclude firms in financial industries (Standard Industrial Classification codes 6000-6999) to avoid possible confounding effects. The results confirm our prior results.

Second, the impact of government ownership might be different for domestic firms and foreign firms (Borisova, Fotak, Holland, & Megginson, 2012). Governments are more likely to support domestic firms, because a default of a foreign firm in which they have a stake is less likely to carry the political stigma associated with the failure of a domestic firm. Governments are also less likely to impose social and political goals on foreign firms. It could also be argued that local government investors are better at overcoming information asymmetries. On the other hand, foreign governments might be better monitors of firms in which they invest. However, the number of observations with foreign government ownership stakes in our sample is very limited. We have 11

observations prior to 2007, 17 observations in 2007, 24 observations in 2008, and 9 observations in 2009. As a robustness check we re-estimated the regressions in Tables 5-9 considering domestic government ownership only, but the results remain qualitatively the same.

Third, Table 4 showed that firms with government ownership tend to be very large firms. To investigate the extent to which our results are driven by the very large firms in our sample, we re-estimated all regressions for a sample in which the top 5% largest firms in 2006 (based on total assets) were removed. The results again confirm the findings reported in the paper. One exception is the positive effect of government ownership on investment disappears when we consider subsamples based on control of corruption.

Finally, in a recent paper, King and Roberts (2012) point to limitations in the use of robust standard error estimates. As a robustness check we therefore re-estimated the regression in this paper with classical standard errors. However, the results are again very similar to the ones reported in the paper[3].

CONCLUSIONS

This study examines the value of government ownership in Europe during the Global Financial Crisis. Using a large sample of European listed firms in the 2005-2009 period, we find that the value of government ownership has significantly increased during the crisis. We also find that stock returns during the crisis were positively related to

government ownership at the start of the crisis. Furthermore, our results suggest that the increasing value of government ownership during the crisis depends on the quality of governance in a country. During the crisis, government ownership became more valuable only in countries with good investor protection and low corruption. This indicates that a sufficient level of institutional quality is necessary for the benefits of government ownership to materialize. These findings raise the question to what extent the benefits of government ownership, perceived by stock market investors and incorporated in stock market valuations, reflect real benefits for firms. We explore this issue by examining the relationship between government ownership and firm investments. Consistent with the hypothesis that the guarantees provided by government ownership allow firms to reduce financing constraints on investments, we find that government ownership had a significant positive impact on investments during the crisis. Again, our results indicate that the positive effect of government ownership depends on the quality of governance in a country.

Overall, our findings suggest that in countries with good investor protection and low corruption, the positive effect of implicit and explicit government guarantees helps to alleviate financial supply shocks and outweigh the negative effect of potential political intervention. Our research has important practical implications. It provides guidance to the ongoing debate about the proper role of government in public firms. While many practitioners argue that the political objectives of government owners cause inefficiency, the positive effect of government ownership during the crisis we find highlights the

value of government guarantee in alleviating negative shocks. Our results imply that government involvement in public firms during an economic downturn can be justified. Furthermore, we shed light on the importance of institutional quality in the functioning of government ownership.

Our study is subject to a number of limitations, which point to some interesting avenues for further research. First, while our results suggest that government ownership increases firm value during a crisis, this does not imply that the economy as a whole benefits from this support. If the government support of firms is beneficial to the shareholders of these firms, this may come at the expense of other participants in the economy. For example, governments might support incumbent old economy firms, at the expense of new firms and new industries (Rajan & Zingales, 2003). So an interesting avenue for further research could be to examine how supported firms perform in the long run, and what happens if the governments get out. Second, our dataset does not allow us to directly examine how government ownership affects the firm value. It is not clear to what extent our results are determined by implicit and/or explicit government guarantees which reduce financing constraints during a crisis, and/or by reduced incentives of governments to divert resources from these firms. An investigation of the direct mechanisms in which government ownership improves firm value would therefore also be an interesting avenue for further research. For example, it would be interesting to learn more about how government ownership affects the financing and corporate governance of firms during a crisis. Third, our sample consists

of European firms only. Most of these firms are located in countries with relatively strong institutions, where investors are well protected. This raises the question what the value of government ownership during a crisis is in countries with very weak institutions. Furthermore, our results are based on the Global *Financial* Crisis. So, we cannot be sure that our findings apply to other crises. It would therefore be interesting to investigate the impact of government ownership for a worldwide sample which considers different crises. Finally, another route that future research might take is studying differences in direct government ownership versus participation via sovereign wealth funds (a distinction which we cannot observe).

NOTES

1 Renders & Gaeremynck (2012) also find that European firms with a higher risk of expropriation by controlling shareholders tend to have weaker firm-level corporate governance, and that the value of good firm-level corporate governance is higher if the expropriation risk is higher. Since corporate governance in most European countries is based on the "comply-or-explain" principle (Aguilera & Cuervo-Cazurra, 2010), controlling shareholders of European firms are able to decide on the quality of corporate governance that the firm implements.

2 As an alternative measure we also used the rule of law score from the same source, which measures the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts,

as well as the likelihood of crime and violence. Results (available from the authors) are very similar to the results reported in the paper on Control of Corruption. This is not surprising, since both measures are strongly correlated.

3 As noted before, we also used the corrected anti-director index in 2005 by Spamann (2010) as an alternative measure of institutional quality. The results are again qualitatively similar to those for the anti-director rights index reported in the paper.

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TABLE 1

Country Distribution of Sample

Country	No. of Firms	No. of Obs.	No of Obs. with Block GovOwn	Mean of Block GovOwn(%)	Control of Corruption (2009)	Anti-Director Rights Index
Austria	64	199	9	33.48	1.76	-
Belgium	133	517	8	35.75	1.37	2
Croatia	25	101	3	55.24	0.22	4
Czech Republic	7	25	2	68.21	0.96	3
Denmark	117	406	67	10.18	1.87	2
Estonia	8	33	4	25.68	1.13	2
Finland	118	518	43	32.07	1.94	2
France	573	2,458	66	26.40	1.43	4
Germany	663	2,598	94	26.87	1.63	3
Greece	194	879	15	37.92	0.64	3
Hungary	8	34	0	-	0.82	2
Iceland	11	23	0	-	1.72	2
Ireland	50	194	3	25.41	1.71	3
Italy	182	719	51	34.02	0.39	4
Latvia	16	55	1	38.62	0.83	2
Lithuania	34	109	11	78.31	0.72	3
Luxembourg	10	25	4	30.12	1.83	0
Netherlands	85	355	10	10.06	1.78	1
Norway	150	467	78	23.62	1.88	3
Poland	180	686	96	18.79	0.68	2
Portugal	49	202	2	5.71	1.04	3
Romania	3	12	0	-	0.10	2
Russia	21	47	6	33.55	-0.77	-
Slovakia	4	8	0	-	0.65	2
Slovenia	23	69	1	51.00	1.11	4
Spain	147	571	6	17.43	1.13	-
Sweden	288	1,109	95	11.50	1.93	2
Switzerland	156	686	23	25.36	1.75	1
United Kingdom	1,751	6,226	120	10.12	1.71	3
Total	5,070	19,331	818	21.67		

This table reports the country distribution of the sample and the measures of institutional quality for each country. Control of corruption is from the *Worldwide Governance Indicators* by Kaufmann, Kraay, and Mastruzzi (2010). Anti-Director Rights Index is the anti-director rights index of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) updated for 2005 by Martynova and Renneboog (2010).

TABLE 2

Year Distribution of Sample

Year	Total Observations (1)	Observations with Block Government Ownership					
		Total (2)	% (2)/(1)	5%-10%	10%-20%	20%-50%	>50%
2005	2,574	65	2.53	15	14	23	13
2006	4,189	114	2.72	36	21	32	25
2007	4,671	254	5.44	130	61	37	26
2008	3,958	287	7.25	146	71	43	27
2009	3,939	98	2.49	24	20	28	26
Total	19,331	818	4.23	351	187	163	117

This table reports the number of observations in each year, and the distribution of observations with government ownership in each year.

TABLE 3

Descriptive Statistics and Pearson Correlation Matrix

		Mean	Std. Dev	VIF	1	2	3	4	5	6	7	8	9	10	11	12	13
1	*LnMarket/Book*	0.27	0.61	1.11	1.00												
2	*Investment*	0.07	0.17	1.09	**0.06**	1.00											
3	*GovDummy*	0.04	0.20	2.18	**-0.02**	0.00	1.00										
4	*GovPercentage*	0.01	0.06	2.19	**-0.03**	**0.00**	**0.71**	1.00									
5	*Leverage*	0.52	0.28	1.10	**0.19**	**-0.02**	0.00	0.01	1.00								
6	*LnAssets*	11.89	2.24	1.52	**-0.14**	**0.10**	**0.17**	**0.16**	**0.15**	1.00							
7	*FixedAssets*	0.52	0.26	1.15	**-0.24**	**0.21**	**0.07**	**0.08**	**-0.14**	**0.27**	1.00						
8	*CashFlow*	0.03	0.19	1.25	**-0.07**	**0.21**	**0.04**	**0.04**	**-0.13**	**0.33**	**0.06**	1.00					
9	*INDUSTRIAL*	0.62	0.49	1.03	**0.03**	**0.03**	**-0.01**	**-0.04**	**0.06**	**0.07**	**-0.03**	**0.02**	1.00				
10	*FAMILY*	0.46	0.50	1.13	**-0.02**	**-0.02**	**-0.10**	**-0.10**	0.01	**-0.28**	**-0.13**	**-0.07**	**-0.10**	1.00			
11	*INSTITUTIONAL*	0.77	0.42	1.10	**0.03**	**0.03**	**0.05**	-0.01	**-0.01**	**0.22**	**0.09**	0.00	**-0.05**	**-0.08**	1.00		
12	*Return*	-0.59	0.27	1.12	-0.03	**-0.08**	**0.04**	**0.05**	-0.01	**-0.06**	**-0.02**	**0.06**	**0.03**	**-0.05**	**-0.15**	1.00	
13	*Beta*	0.81	1.24	1.05	**0.06**	**0.04**	0.00	0.00	-0.01	**-0.04**	**-0.04**	**-0.04**	-0.02	**0.06**	0.00	**-0.16**	1.00

This table reports the descriptive statistics and the Pearson correlation matrix, which is based on the sample for the analysis of firm value from 2004to 2009 (19,331 observations). For *Return* and *Beta*, we use the crisis period sample (3,441 firms). *GovDummy* equals 1 for firms with government ownership and 0 otherwise. *GovPercentage* is the proportion of government-owned shares to total shares. *Market/Book* is the market-to-book ratio of total assets.*Investment* is calculated as (Fixed Assets at the end of year *t* - Fixed Assets at the end of *t-1* + Depreciation in year *t*)/Total Assets at the end of year *t*. *LnAssets* is the natural logarithm of total assets. *FixedAssets* is the ratio of fixed assets over total assets. *Leverage* is the ratio of total liabilities to total assets. *CashFlow* is the ratio of operating income before depreciation to total assets. *Return* is the cumulative stock return from July 16, 2007 to March 9, 2009. *Beta* is computed by regressing a firm's monthly stock return in the pre-crisis period on the corresponding country index return from Datastream using the Dimson (1979) method. **Bold** indicates significance at the 1% level.

TABLE 4

Differences between Government Owned and Non-Government Owned Firms

Panel A: Financial Characteristics for 2005-2009			
	Observations without Block GovOwn	Observations with Block GovOwn	Difference Test (T)
Market/Book	1.58	1.38	4.17***
Crisis Period Return	-0.59	-0.53	-2.24*
Investment	0.07	0.07	-0.04
Total Assets(€M)	1,440.91	5,398.34	-20.97***
FixedAssets	0.51	0.61	-10.26***
Leverage	0.52	0.52	0.15
CashFlow	0.03	0.07	-5.14***
N	18,513	818	
Panel B: Ownership Characteristics in 2006			
	Firms without Block GovOwn	Firms with Block GovOwn	
INDUSTRIAL	0.67	0.62	
FAMILY	0.46	0.15	
INSTITUTIONAL	0.73	0.78	
N	4,075	114	

†p<.10; *p<.05; **p<.01; ***p< .001.

This table compares the differences in the mean of the financial and ownership characteristics between firms with block government ownership and firms without block government ownership. Panel A compares the mean of financial characteristics during the period of 2005-2009, except for *Crisis Period Return*, which is the cumulative stock return from July 16, 2007 to March 9, 2009 for 3,441 firm observations. *Total Assets* is the total assets in million Euro measured at the end of each year. *Market/Book* is the market-to-book ratio of total assets. *Investment* is calculated as (Fixed Assets at the end of year *t* - Fixed Assets at the end of *t-1* + Depreciation in year *t*)/Total Assets at the end of year *t*. *FixedAssets* is the ratio of fixed assets over total assets. *Leverage* is the ratio of total liabilities to total assets. *CashFlow* is the ratio of operating income before depreciation to total assets. Panel B compares the ownership characteristics as of 2006. *INDUSTRIAL* equals 1 for firms with ownership over 5% by industrial companies and 0 otherwise. *FAMILY* equals 1 for firms with ownership over 5% by family owners and 0 otherwise. *INSTITUTIONAL* equals 1 for firms with ownership over 5% by bank, mutual funds, insurance, private equity and financial companies and 0 otherwise.

TABLE 5

Government Ownership and Firm Value

	(1)	(2)	(3)	(4)	(5)	(6)
GovOwn	GovDummy		GovPercentage		GovPercentage	
GovOwn_lag	-0.01	-0.01	-0.10	-0.10		-0.00
	(-0.50)	(-0.26)	(-1.28)	(-1.38)		(-0.04)
*GovOwn06*2007*	0.07*	0.07*	0.21*	0.21**		
	(2.01)	(2.10)	(2.57)	(2.91)		
*GovOwn06*2008*	0.11*	0.11*	0.34**	0.32**		
	(2.13)	(2.40)	(2.74)	(3.27)		
*GovOwn06*2009*	0.12***	0.12***	0.28***	0.26***		
	(3.40)	(3.44)	(3.34)	(3.47)		
LnGovPercentage_lag					-0.05	
					(-1.60)	
GovPercentage_lag²						-0.16
						(-1.11)
Leverage	0.53***	0.54***	0.53***	0.54***	0.31	0.53***
	(11.91)	(12.17)	(11.93)	(12.19)	(1.15)	(11.88)
FixedAssets	-0.19***	-0.18***	-0.19***	-0.18***	-0.14	-0.19***
	(-3.85)	(-3.55)	(-3.83)	(-3.54)	(-0.91)	(-3.87)
LnAssets	-0.34***	-0.35***	-0.35***	-0.35***	-0.24***	-0.35***
	(-7.20)	(-7.37)	(-7.22)	(-7.38)	(-6.48)	(-7.22)
2006	0.11***	0.11***	0.11***	0.11***	0.09*	0.11***
	(8.34)	(7.90)	(8.44)	(7.97)	(2.12)	(8.38)
2007	0.06†	0.11***	0.06†	0.10***	0.09†	0.06†
	(1.74)	(5.64)	(1.76)	(5.78)	(1.81)	(1.82)
2008	-0.33***	-0.23***	-0.33***	-0.23***	-0.25***	-0.33***
	(-4.74)	(-5.04)	(-4.79)	(-5.14)	(-4.34)	(-4.77)
2009	-0.18***	-0.12***	-0.17***	-0.12***	-0.09†	-0.17***
	(-5.13)	(-6.97)	(-5.26)	(-7.34)	(-1.80)	(-5.16)
INDUSTRIAL_lag		0.00		0.00		
		(0.31)		(0.27)		
*INDUSTRIAL06*2007*		0.02†		0.02†		
		(1.77)		(1.88)		
*INDUSTRIAL06*2008*		0.04*		0.04*		
		(2.42)		(2.50)		
*INDUSTRIAL06*2009*		0.02†		0.02*		
		(1.95)		(1.97)		

FAMILY_lag			-0.02	-0.02		
			(-1.59)	(-1.63)		
*FAMILY06*2007*			-0.01	-0.01		
			(-0.70)	(-0.67)		
*FAMILY06*2008*			-0.04	-0.03		
			(-1.60)	(-1.56)		
*FAMILY06*2009*			-0.03	-0.03†		
			(-1.64)	(-1.68)		
INSTITUTIONAL_lag			-0.02	-0.02		
			(-1.21)	(-1.21)		
*INSTITUTIONAL06*2007*			-0.08**	-0.08**		
			(-3.12)	(-3.11)		
*INSTITUTIONAL06*2008*			-0.16**	-0.15**		
			(-3.26)	(-3.29)		
*INSTITUTIONAL06*2009*			-0.07**	-0.07**		
			(-2.94)	(-2.97)		
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
N	18,854	18,854	18,854	18,854	674	18,854
R^2	0.425	0.431	0.425	0.432	0.404	0.424

†p<.10; *p<.05; **p<.01; ***p< .001.

This table reports the panel data regression results of firm value on government ownership. The dependent variable is the natural logarithm of market-to-book ratio of total assets. *GovOwn* is measured by either a dummy equal to 1 for firms with government ownership and 0 otherwise (columns 1-2) or the *percentage of* government ownership (columns 3-4). *GovOwn_lag* is the lagged value of *GovOwn*. *GovOwn06* is the *GovOwn* at the end of 2006. *LnAssets* is the natural logarithm of total assets. *FixedAssets* is the ratio of fixed assets over total assets. *Leverage* is the ratio of total liabilities to total assets. *INDUSTRIAL* equals 1 for firms with ownership over 5% by industrial companies and 0 otherwise. *INDUSTRIAL*_lag is the lagged value of *INDUSTRIAL*. *INDUSTRIAL*06 is the *INDUSTRIAL* at the end of 2006. *FAMILY* equals 1 for firms with ownership over 5% by family owners and 0 otherwise. *FAMILY*_lag is the lagged value of *FAMILY*. *FAMILY*06 is the *FAMILY* at the end of 2006. *INSTITUTIONAL* equals 1 for firms with ownership over 5% by bank, mutual funds, insurance, private equity and financial companies and 0 otherwise. *INSTITUTIONAL_lag* is the lagged value of *INSTITUTIONAL*. *INSTITUTIONAL*06 is the *INSTITUTIONAL* at the end of 2006. Ln*GovPercentage_lag* is the natural logarithm of *GovPercentag_lag*. *GovPercentage_lag*^{2} is the squared term of *GovPercentage_lag*. *2006*, *2007*, *2008*, and *2009* are year dummies. *T* statistics (in parentheses) are based on heteroscedasticity-consistent standard errors clustered at the country and the firm level.

TABLE 6

Government Ownership and Crisis Period Return

	(1)	(2)	(3)	(4)	(5)	(6)
GovOwn	GovDummy		GovPercentage		GovPercentage	
GovOwn06	0.09**	0.07**	0.26**	0.22*		0.25
	(2.75)	(2.61)	(2.69)	(2.32)		(1.41)
LnGovPercentage06					0.05	
					(1.39)	
GovPercentage06^2						-0.05
						(-0.17)
BETA	-0.06***	-0.06***	-0.06***	-0.06***	-0.14***	-0.06***
	(-4.58)	(-4.67)	(-4.58)	(-4.67)	(-4.21)	(-4.67)
Market/Book	-0.00	-0.00	-0.00	-0.00	0.02	-0.00
	(-1.07)	(-0.12)	(-1.08)	(-0.12)	(1.10)	(-0.12)
Leverage	0.01	-0.00	0.01	-0.00	0.06	-0.00
	(0.35)	(-0.05)	(0.31)	(-0.11)	(0.34)	(-0.10)
LnAssets	-0.01	-0.01	-0.01	-0.01	-0.02†	-0.01
	(-1.51)	(-1.22)	(-1.52)	(-1.22)	(-1.67)	(-1.23)
INDUSTRIAL		0.01		0.01	0.03	0.01
		(1.40)		(1.51)	(0.65)	(1.50)
FAMILY		-0.03**		-0.03**	-0.08	-0.03**
		(-2.81)		(-2.82)	(-1.54)	(-2.82)
INSTITUTIONAL		-0.09**		-0.08**	-0.05	-0.08**
		(-2.83)		(-2.82)	(-0.99)	(-2.83)
Constant	-0.41**	-0.39***	-0.41**	-0.39***	-0.10	-0.39***
	(-3.19)	(-3.33)	(-3.21)	(-3.38)	(-0.60)	(-3.39)
N	3,441	3,441	3,441	3,441	102	3,441
Adj. R^2	0.049	0.070	0.050	0.071	0.099	0.070

†p<.10; *p<.05; **p<.01; ***p< .001

This table reports the OLS regression results of stock returns during the crisis on government ownership. The dependent variable is the cumulative stock return from July 16, 2007 to March 9, 2009. *GovOwn06* is measured by either a dummy equal to 1 for firms with government ownership at the end of 2006 and 0 otherwise (columns 1-2) or the percentage government ownership at the end of 2006 (columns 3-6). *Beta* is computed by regressing a firm's monthly stock return in the pre-crisis period on the corresponding country index return from *Datastream* using the Dimson (1979) method. *LnAssets* is the natural logarithm of total assets at the end of 2006. *Leverage* is the ratio of total liabilities to total assets. *INDUSTRIAL* equals 1 for firms with ownership over 5% by industrial companies and 0 otherwise. *FAMILY* equals 1 for firms with ownership over 5% by family owners and 0 otherwise. *INSTITUTIONAL* equals 1 for firms with ownership over 5% by bank, mutual funds, insurance, private equity and financial companies and 0 otherwise. *INDUSTRIAL, FAMILY and INSTITUTIONAL are measured at the end of 2006.* Ln*GovPercentage06* is the natural logarithm of *GovPercentage at the end of 2006. GovPercentage06*^{2} is the squared term of *GovPercentage*at the end of 2006. *T* statistics (in parentheses) are based on heteroscedasticity-consistent standard errors.

TABLE 7

Government Ownership and Firm Value: The Role of Institutional Quality

	(1)	(2)	(3)	(4)	(5)	(6)
Indicator:	Control of Corruption			Anti-Director Rights Index		
Sample:	Low	Middle	High	Low	Middle	High
GovPercentage_lag	-0.18**	-0.01	-0.09	-0.02	-0.19	-0.05
	(-2.86)	(-0.08)	(-0.92)	(-0.03)	(-1.63)	(-0.72)
*GovPercentage06 *2007*	0.11	0.09	0.10	0.22	0.31***	0.18*
	(1.32)	(1.18)	(1.10)	(0.76)	(3.90)	(2.10)
*GovPercentage06 *2008*	0.08	0.49***	0.17	0.30	0.29**	0.41**
	(0.69)	(6.96)	(1.46)	(0.42)	(3.12)	(2.78)
*GovPercentage06 *2009*	0.19†	0.34***	0.14**	0.11	0.36†	0.28**
	(1.93)	(5.73)	(2.62)	(0.40)	(1.91)	(3.01)
Leverage	0.42***	0.67***	0.42***	0.25***	0.53***	0.54***
	(6.46)	(10.03)	(7.18)	(4.20)	(6.15)	(10.83)
FixedAssets	-0.17	-0.12†	-0.20	-0.29***	-0.57***	-0.13**
	(-1.29)	(-1.93)	(-1.49)	(-9.26)	(-8.37)	(-2.78)
LnAssets	-0.36***	-0.29***	-0.43***	-0.29***	-0.17***	-0.34***
	(-3.90)	(-6.03)	(-3.46)	(-14.02)	(-4.77)	(-7.68)
2006	0.18**	0.08***	0.08***	0.09***	0.12*	0.10***
	(2.92)	(4.70)	(11.51)	(4.31)	(2.04)	(12.71)
2007	0.19***	0.09*	0.05	0.07*	0.05	0.04
	(3.48)	(2.15)	(1.34)	(2.04)	(0.68)	(1.22)
2008	-0.22***	-0.29***	-0.34***	-0.25***	-0.38***	-0.35***
	(-7.23)	(-7.21)	(-6.55)	(-5.76)	(-7.69)	(-3.92)
2009	-0.14***	-0.13***	-0.16***	-0.12***	-0.18***	-0.19***
	(-3.68)	(-4.60)	(-6.13)	(-3.43)	(-5.66)	(-4.68)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
N	2,606	9,265	5,957	1,063	3,350	13,650
R^2	0.459	0.399	0.472	0.381	0.438	0.423

†p<.10; *p<.05; **p<.01; ***p< .001.

This table reports the panel data regression results of firm value on government ownership for subgroups based on Control of Corruption score (columns 1-3) or on the Anti-Director Rights Indexin 2005 (columns 4-6). The dependent variable is the natural logarithm of market-to-book ratio of total assets. *GovPercentage_lag* is the lagged value of percentage of government ownership. GovPercentage06 is the *percentage of* government ownership at the end of 2006. *LnAssets* is the natural logarithm of total assets. *FixedAssets* is the ratio of fixed assets over total assets. *Leverage* is the ratio of total liabilities to total assets.*2006*, *2007*, *2008*, and *2009* are year dummies. *T* statistics (in parentheses) are based on heteroscedasticity-consistent standard errors clustered at the country and firm level.

TABLE 8

Government Ownership and Crisis Period Return:The Role of Institutional Quality

	(1)	(2)	(3)	(4)	(5)	(6)
Indicator:	Control of Corruption			Anti-Director Rights Index		
Sample:	Low	Middle	High	Low	Middle	High
GovPercentage	0.06	0.41***	0.39**	0.15	0.09	0.32**
	(0.63)	(7.09)	(2.75)	(0.97)	(0.68)	(3.10)
BETA	-0.06***	-0.08***	-0.04***	-0.12***	-0.08**	-0.05***
	(-14.27)	(-15.21)	(-5.49)	(-5.32)	(-3.27)	(-4.31)
Market/Book	-0.01	-0.01**	-0.00	-0.02**	-0.00	-0.00
	(-0.93)	(-3.08)	(-0.55)	(-3.07)	(-0.67)	(-0.36)
Leverage	-0.09*	-0.08**	0.03	0.01	-0.11***	0.03
	(-2.28)	(-3.20)	(1.06)	(0.03)	(-3.39)	(1.20)
LnAssets	0.00	-0.02***	-0.01	-0.01*	-0.01	-0.01
	(0.45)	(-9.44)	(-1.16)	(-2.04)	(-1.53)	(-1.47)
Constant	-0.58***	-0.10**	-0.45**	-0.31***	-0.34**	-0.42**
	(-6.01)	(-2.80)	(-3.15)	(-15.22)	(-3.11)	(-2.79)
N	473	698	2,270	207	626	2,473
adj. R^2	0.086	0.113	0.026	0.060	0.107	0.039

†p<.10; *p<.05; **p<.01; ***p< .001.

This table reports the OLS regression results of stock returns during the crisis on government ownership for subgroups based on Control of Corruption score (columns 1-3) or on the Anti-Director Rights Index in 2005 (columns 4-6).The dependent variable is the cumulative stock return from July 16, 2007 to March 9, 2009.*GovPercentage* is the *percentage of* government ownership at the end of 2006. *Beta* is computed by regressing a firm's monthly stock return in the pre-crisis period on the corresponding country index return from *Datastream* using the Dimson (1979) method. *LnAssets* is the natural logarithm of total assets at the end of 2006. *Leverage* is the ratio of total liabilities to total assets. *T* statistics (in parentheses) are based on heteroscedasticity-consistent standard errors.

TABLE 9

Government Ownership and Investments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Indicator:		Control of Corruption			Anti-Director Rights Index		
Sample:	Full	Low	Middle	High	Low	Middle	High
GovPercentage_lag	0.06	0.04	0.01	0.06	0.16	0.13	0.06
	(1.29)	(0.72)	(0.21)	(0.59)	(1.42)	(1.36)	(1.08)
*GovPercentage06 *2007*	-0.00	-0.03	0.06	-0.05	-0.23***	0.04	-0.01
	(-0.08)	(-0.49)	(0.68)	(-0.82)	(-107.14)	(0.77)	(-0.18)
*GovPercentage06 *2008*	0.06	-0.30†	0.20**	0.14*	0.24*	0.18*	0.02
	(0.91)	(-1.92)	(2.60)	(2.09)	(2.15)	(2.45)	(0.22)
*GovPercentage06 *2009*	0.14**	0.08	0.16	0.14	-0.15***	0.29*	0.11*
	(2.91)	(1.19)	(1.24)	(1.48)	(-7.17)	(1.98)	(2.53)
LnAssets	0.13***	0.16***	0.12***	0.15***	0.07***	0.08†	0.13***
	(11.46)	(4.71)	(5.00)	(6.74)	(144.93)	(1.92)	(12.15)
Market/Book	0.01†	-0.00	0.00	0.00	0.02***	-0.01*	0.01*
	(1.66)	(-0.08)	(0.46)	(0.72)	(71.97)	(-2.15)	(2.48)
CashFlow	0.20***	0.09	0.23***	0.17**	0.41***	0.25***	0.18***
	(13.55)	(1.08)	(18.17)	(2.61)	(296.79)	(5.78)	(12.48)
2006	-0.03***	-0.03†	-0.03***	-0.04***	-0.04***	-0.03***	-0.03***
	(-6.43)	(-1.65)	(-4.86)	(-5.29)	(-5413.41)	(-3.74)	(-4.95)
2007	-0.05***	-0.03	-0.04*	-0.05**	-0.03***	-0.05†	-0.04***
	(-4.11)	(-1.28)	(-2.40)	(-2.86)	(-28.02)	(-1.75)	(-3.49)
2008	-0.09***	-0.04†	-0.09***	-0.10**	-0.02***	-0.10***	-0.09***
	(-4.68)	(-1.79)	(-4.75)	(-3.11)	(-32.25)	(-3.38)	(-4.02)
2009	-0.08***	-0.08***	-0.07***	-0.08**	-0.01***	-0.08***	-0.08***
	(-8.67)	(-4.06)	(-5.72)	(-2.98)	(-41.33)	(-4.05)	(-9.35)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	15,387	1,671	8,009	4,807	628	2,169	11,996
R^2	0.141	0.153	0.142	0.151	0.141	0.108	0.148

†p<.10; *p<.05; **p<.01; ***p< .001.

This table reports the panel data regression results of investments on government ownership. Column 1 is for the full sample. Columns 2-4 are for the subgroups based on the Control of Corruption score. Columns 5-7 are for the subgroups based on the Anti-Director Rights Index in 2005. The dependent variable *Investment* is calculated as (Fixed Assets at the end of year *t* - Fixed Assets at the end of year *t-1* + Depreciation in year *t*)/Total Assets at the end of year *t. GovPercentage_lag is* the lagged value of percentage of government ownership. GovPercentage06 is the percentage of government ownership at the end of 2006. *LnAssets* is the natural logarithm of total assets. *Market/Book* is the market-to-book ratio of total assets. *CashFlow* is the ratio of operating income before depreciation to total assets. *Before* is a dummy equal to 1 for years 2004-2006 and 0 otherwise. *2006*, *2007*, *2008*, and *2009* are year dummies. *T* statistics (in parentheses) are based on heteroscedasticity-consistent standard errors clustered at the country and firm level.