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Does the Contribution of Corporate Cash Holdings and Dividends to Firm Value Depend on Governance? A Cross-country Analysis

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ABSTRACT

Agency theories predict that the value of corporate cash holdings is less in countries with poor investor protection because of the greater ability of controlling shareholders to extract private benefits from cash holdings in such countries. Using various specifications of the valuation regressions of Fama and French (1998), we find that the relation between cash holdings and firm value is much weaker in countries with poor investor protection than in other countries. In further support of the importance of agency theories, the relation between dividends and firm value is weaker in countries with stronger investor protection.

ACCORDING TO AGENCY THEORIES, THOSE who control firms do so to further their own interests. When corporate governance works well, those in control of a corporation, whom we refer to as controlling shareholders, find it more beneficial to increase shareholder wealth than to expropriate minority shareholders. In contrast, with poor corporate governance, controlling shareholders can derive substantial private benefits from control at the expense of minority shareholders (see, for instance, Dyck and Zingales (2004) and Nenova (2003)).

As Myers and Rajan (1998) argue, liquid assets can be turned into private benefits at lower cost than other assets. Liquid assets therefore represent a promising opportunity to investigate the implications of agency theories. According to these theories, we would expect controlling shareholders to overinvest in liquid assets. Existing empirical evidence by Dittmar, Mahrt-Smith, and Servaes (2003) and Kalcheva and Lins (2004) is consistent with this prediction.

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However, because countries in which the appropriation of private benefits is easier are also typically riskier (see Acemoglu et al. (2003)), firms in these countries may hold more cash simply because they require a larger buffer to protect themselves against adverse shocks.

If controlling shareholders maximize firm value and hold more liquid assets in countries in which the appropriation of private benefits is easier because such countries are riskier, then minority shareholders should not value liquid assets in these countries less than they do in countries in which appropriation of private benefits is more difficult. Conversely, if controlling shareholders pursue their interests partly at the expense of minority investors, agency theories predict that liquid assets should be worth less to minority investors in countries in which the appropriation of private benefits is easier since some of these assets are used to finance controlling shareholders' private benefits.

Empirical research shows that corporate governance is poorer and, in turn, the appropriation of private benefits by controlling shareholders is easier, in countries with poor investor protection (see La Porta et al., hereafter LLSV, (2000a) for a review). In this paper, we investigate whether the value of liquid assets is lower for minority shareholders in countries where investor protection is poorer. Investor protection has two components, namely, a legal rights component, whereby investors are granted legal rights, and an enforcement component, whereby the quality of a country's institutions determines the extent to which these rights are respected and enforced. We investigate these two components separately. Using a sample that spans 35 countries and 11 years, we find that in countries with high investor protection, a dollar of liquid assets is worth roughly a dollar to minority investors. In contrast, in countries with poor investor protection, a dollar of liquid assets is worth much less. For instance, in one specification of our tests, we estimate that a dollar of liquid assets is worth \$0.91 in countries with above-median investor protection while it is worth only \$0.33 in other countries. The difference between the two estimates is highly significant.

To conduct our investigation, we classify countries according to the median of various indices of investor protection. This procedure allows us to compare the relation between firm value and liquid assets in countries with either high or low investor protection. We then estimate how the relation between firm value and firm characteristics depends on investor protection using various specifications of the Fama–French (1998) model. Our results are not sensitive to the specification we use. We also undertake a number of robustness tests that provide additional evidence in support of the hypothesis that liquid assets are valued less in countries with poor investor protection.

Private benefits should create a wedge between the value of a dollar inside the firm and the value of a dollar paid out. No private benefits can be consumed from dollars paid out, while dollars kept in the firm enable those who control the corporation to consume more private benefits. It follows that, if investors discount the value of cash holdings because they expect the cash to be partly consumed as private benefits, they should value dividends in that country at a premium compared to a country where private benefits are less important.

As long as dividends are sticky, high current levels of dividends predict high future levels of dividends, and hence lower consumption of private benefits.

We investigate how investors' valuation of dividends across the world is related to investor protection and find strong support for our hypothesis. With a representative specification, we find that a dividend payment rate corresponding to 1% of a firm's assets increases firm value by 9.80% in countries where the minority shareholder index from LLSV (1998) is below the median, but only by 4.07% in the other countries. Again, the difference between the two estimates is significant at conventional levels.

Our results contribute to several strands of the finance literature. First, a growing literature investigates the relation between firm value and investor protection. In particular, authors show that the incentive effects of ownership of cash flow rights are stronger in countries with poorer investor protection, while the existence of a wedge between ownership of cash flow rights and control rights has more of an impact on firms in countries with poor investor protection (see, for instance, Claessens et al. (2002), LLSV (2002), Lins (2003)). This literature also shows that firms that choose to use the capital markets of countries with better investor protection are valued more highly and that the associated valuation premiums are inversely related to investor protection in the firm's country (Doidge, Karolyi, and Stulz (2004)). Finally, some authors find that firm value is negatively related to proxies for investor protection (see, for instance, Durnev and Kim (2005)). Our contribution to this literature is to identify a discount for liquid asset holdings in countries with poor investor protection. In particular, we show that a source of value loss in these countries is that outside shareholders do not receive the full value of liquid assets owned by the firm.

Second, our paper contributes to the free cash flow literature that builds on Jensen (1986). Jensen (1986) identifies agency costs of free cash flow. Dittmar et al. (2003) show that firms in countries with low investor protection hold more cash than do firms in other countries, Kalcheva and Lins (2004) show that firms hold more liquid assets when there is more of a discrepancy between a controlling shareholder's holdings of cash flow rights versus voting rights, and Dittmar and Mahrt-Smith (2005) provide evidence that liquid asset holdings in U.S. firms are valued more in firms with a low value of the Gompers, Ishii, and Metrick (2003) index, which has low values for firms with fewer anti-takeover protections. These results are consistent with the hypothesis that it is less costly for the controlling shareholders to consume the private benefits attached to cash holdings and, therefore, they value cash holdings more, when investors are less well protected. In the presence of agency costs of free cash flow, cash holdings should be discounted since they are partly spent to increase the welfare of those who control the firm rather than to maximize the wealth of all investors. Our paper documents that this discounting takes place in countries in which we expect agency costs to be particularly significant.

Finally, our paper also contributes to the literature on tunneling (see, for instance, Johnson et al. (2000)). This literature establishes that those who control firms in countries with poor investor protection can expropriate outside

investors by taking actions that remove valuable assets from the firm. Tunneling is more likely in countries with poor investor protection. We show that outside investors discount firm assets in countries with poor investor protection to reflect their expectations that they will not receive the full benefit of these assets.

It is important to note that our study faces many of the limitations inherent to cross-country studies. We also believe that our use of a sample that covers a longer period of time than is typical in the cross-country literature is helpful because it allows us to estimate change regressions. Nevertheless, the limited number of independent observations makes it harder to distinguish among possible explanations for our results. Thus, while the results are consistent with the hypotheses we test, we cannot completely exclude alternate explanations, such as the explanation that the accounting numbers of countries with poorer investor protection are not as reliable as the accounting numbers in countries with better investor protection.

The paper proceeds as follows. In Section I, we present in more detail the motivation for the two hypotheses we test in this paper. In Section II, we introduce the approach we use to test our hypotheses. We describe our data in Section III. In Section IV, we report the results of our tests of the two hypotheses. In Section V, we examine other possible explanations of our results and provide robustness tests. We conclude in Section VI.

I. The Value of Liquid Asset Holdings and Dividends in the Presence of Agency Costs

Internationally, firms are typically controlled by large shareholders who can impose their will on management (see La Porta, Lopez-de-Silanes, and Shleifer (1999)). The controlling shareholder manages the firm to maximize his welfare. When his interests are perfectly aligned with those of outside investors, the outside investors benefit from the fact that the controlling shareholder maximizes his welfare since by doing so he also maximizes their wealth. However, when the interests of the controlling shareholder and outside investors are not perfectly aligned, that is, when agency problems exist, at times the controlling shareholder will increase his welfare at the expense of outside investors. The benefits that the controlling shareholder extracts from the firm at the expense of other investors are generally referred to as the private benefits of control. The extent to which a firm's controlling shareholder can extract private benefits from his position depends on how well the interests of outside investors are protected in the firm's country. Moreover, as the controlling shareholder extracts more private benefits, the outside investors' assessment of firm value falls. Thus, everything else equal, given that the consumption of private benefits is inversely related to investor protection, firm value is lower in countries in which investor protection is weaker.

In a world of perfect financial markets and no contracting costs, firms invest in all positive net present value projects available to them and pay out the funds that they cannot invest in such projects to shareholders. Of course, funds

paid out to shareholders are funds that controlling shareholders cannot use to further their own interests. For instance, they could otherwise use these funds to increase the empire they control, to make the firm safer so that they are more likely to remain in control, or to increase their personal wealth through tunneling. Controlling shareholders should therefore prefer to keep funds in liquid assets because liquid assets have a private benefit option attached to them that other assets do not have to the same extent. Specifically, liquid assets can immediately be invested in projects that benefit controlling shareholders personally. As Myers and Rajan (1998) point out, it is also easier to make cash disappear than to make a plant disappear.

Note that we do not expect that controlling shareholders transform a firm's liquid assets into private benefits in such a way that the firm is always starved for cash. Rather, consistent with Dittmar et al. (2003) and Kalcheva and Lins (2004), controlling shareholders value investing the firm's assets in cash because doing so provides them with flexibility: The cash is there to be siphoned out of the firm or to be invested in projects that provide more private benefits. To elaborate, if the cash is held by the firm, it serves as a buffer if adverse shocks occur and hence makes it more likely that controlling shareholders will retain control. However, at times controlling shareholders will take advantage of the firm's cash to extract private benefits; for instance, because they feel that their control is threatened or because they simply want to cash out. Thus, on average, the firm will hold more cash than it should, but at times, cash holdings will be reduced close to the amount required for the firm to operate. We therefore expect that the firm's existing cash holdings are highly vulnerable to being used for the future consumption of private benefits. If that is the case, then a firm's cash should be valued at a discount because outside investors own only part of the firm's cash—the rest is owned by the controlling shareholders in the form of future private benefits. Hence, our first hypothesis is:

HYPOTHESIS 1: Cash is valued at a discount in countries with weak investor protection.

While controlling shareholders benefit from siphoning cash after shares have been sold to minority investors, controlling shareholders gain from finding ways to commit to pay out all excess cash they accumulate before selling shares for the first time. If full commitment were possible when shares are sold to investors for the first time, we would find no evidence in support of our hypothesis. However, it is not clear how firms could fully commit themselves to such a payout policy. First, firms would have to find a way to specify how excess cash is determined. Second, in countries in which the legal system functions poorly and the government is corrupt, controlling shareholders can simply renege on such a commitment. Third, such a commitment would drastically decrease the discretion of controlling shareholders, discretion that can be extremely valuable at times to take actions that increase firm value. Fourth, countries with poor investor protection typically also have a low level of financial development, which makes it expensive for firms to raise capital, and consequently, any mechanical rule about how much cash a firm can keep would force firms to go to

the capital markets frequently and hence incur heavy costs of accessing these markets.

As LLSV (2000b) show, firms experience more pressure to pay dividends in countries with poor investor protection because firm resources are more likely to be consumed as private benefits. Ignoring taxes, shareholders gain when a firm in a country with poor investor protection pays out liquid assets that cannot be invested profitably inside the firm at a rate higher than the rate shareholders could earn on the cash outside the firm since part of it will be consumed by the controlling shareholder. Taxation can complicate this reasoning since, if dividends are tax disadvantaged, the value of dividends for minority shareholders is reduced. However, if investor protection is sufficiently weak, the fact that private benefits cannot be taken out of dividends will more than offset the tax disadvantage of dividends. This discussion motivates our second hypothesis:

HYPOTHESIS 2: Dividends contribute more to firm value in countries with weaker investor protection.

II. Test Design

To investigate whether liquid assets are valued more in countries with better investor protection and whether dividends are valued less, we need a regression model that relates firm value to firm characteristics. Fama and French (1998) develop a valuation regression that performs well when subjected to a battery of tests. While this valuation regression is ad hoc in that it does not specify a functional form resulting directly from a theoretical model, it is well suited for our purpose because it explains well cross-section variation in firm values.[1] Their basic regression specification is as follows:

$$\begin{aligned} V_{i,t} = {} & \alpha + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dA_{i,t} + \beta_5 dA_{i,t+1} + \beta_6 RD_{i,t} \\ & + \beta_7 dRD_{i,t} + \beta_8 dRD_{i,t+1} + \beta_9 I_{i,t} + \beta_{10} dI_{i,t} + \beta_{11} dI_{i,t+1} + \beta_{12} D_{i,t} \\ & + \beta_{13} dD_{i,t} + \beta_{14} dD_{i,t+1} + \beta_{15} dV_{i,t+1} + \varepsilon_{i,t}, \end{aligned} \tag{1}$$

where X_t is the level of variable X in year t divided by the level of assets in year t; dX_t is the change in the level of X from year $t-1$ to year t, $X_t - X_{t-1}$, divided by assets in year t; dX_{t+1} is the change in the level of X from year t to year $t+1$, $X_{t+1} - X_t$, divided by assets in year t; V is the market value of the firm calculated at fiscal year end as the sum of the market value of equity, the book value of short-term debt, and the book value of long-term debt; E is earnings before extraordinary items plus interest, deferred tax credits, and investment tax credits; A is total assets; RD is research and development (R&D) expense;

[1] There is a growing literature that examines the value of cash. In addition to the papers mentioned in the introduction, Pinkowitz and Williamson (2005) use the Fama and French (1998) model to analyze the determinants of the value of cash for U.S. firms, and Faulkender and Wang (2005) propose an alternative approach that uses stock returns instead of stock prices.

I is interest expense; and D is dividends defined as common dividends paid. When R&D is missing, we set it equal to zero.

A straightforward way to estimate the relation between market value and cash holdings in Fama and French's model is simply to split the change in assets into its cash and noncash components:

$$\begin{aligned} V_{i,t} = \alpha &+ \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNA_{i,t} + \beta_5 dNA_{i,t+1} + \beta_6 RD_{i,t} \\ &+ \beta_7 dRD_{i,t} + \beta_8 dRD_{i,t+1} + \beta_9 I_{i,t} + \beta_{10} dI_{i,t} + \beta_{11} dI_{i,t+1} + \beta_{12} D_{i,t} \\ &+ \beta_{13} dD_{i,t} + \beta_{14} dD_{i,t+1} + \beta_{15} dV_{i,t+1} + \beta_{16} dL_{i,t} + \beta_{17} dL_{i,t+1} + \varepsilon_{i,t}, \quad (2) \end{aligned}$$

where NA is net assets defined as total assets minus liquid assets and L corresponds to liquid asset holdings. With this modification, we expect the change in liquid asset holdings to contribute less to firm value in countries with poor institutions, so that β_{16} should be lower in such countries. Note that the equation also has the change in cash in the next period. In the Fama and French model, next-period variables are introduced to absorb changes in expectations. In contrast, the contemporaneous change in cash we focus on corresponds directly to an increase in cash that contributes to the firm's assets in place. We would be concerned if, somehow, next period's change in cash contributed more to firm value in countries with poorer investor protection, since in that case one might argue that focusing on this period's change in cash overstates the impact of investor protection on the value of cash. However, this is never the case. To estimate how investor protection is related to the coefficient on changes in cash holdings, we allow the coefficients to vary depending on investor protection. Rather than having a continuous measure of investor protection, we split the sample of countries in half each year and use a dummy variable that equals one in countries with above-median investor protection. We then interact this dummy variable with the independent variables and the constant. The test of Hypothesis 1 is therefore that β_{16} is lower for countries with weaker investor protection, and the test of Hypothesis 2 is that coefficient β_{12} is larger for countries with weaker investor protection.

III. Data

For the tests we describe in the previous section, we require firm-level data as well as data on investor protection. In this section, we discuss the motivation and properties of the data we use. The Appendix reports the sources for the data.

The firm-level data come from Thomson Financial's Worldscope database. There are several problems in using Worldscope data. First, the data are not comprehensive, as they have a bias toward large firms. Second, the data suffer from backfilling. However, we limit though not eliminate the backfilling bias because we have additional information on the firms reported by Worldscope in various years for our sample. Third, the data involve different countries, and the accounting conventions used in producing the data are not the same; there

is no clear way to make the data more comparable across countries beyond what Worldscope already does.

We estimate our regressions using data from 1983 through 1998. However, we report results for the shorter period of 1988 to 1998. The reason for ignoring the first 5 years is that the proportion of emerging countries covered increases sharply in the late 1980s, as does the number of firms covered. Thus, if we start in 1983 the composition of countries with poor investor protection switches abruptly in the late 1980s, whereas if we start in 1988, there is little change in the composition of the countries with poor investor rights. We therefore believe that our results for the period 1988 to 1998 are more reliable, but the results for the longer period are consistent with these results.[2]

Table I reports information on the dependent variable of our regressions, that is, the market value of the firm divided by the book value of assets, as well as the two main variables of interest, namely, cash normalized by book value of assets, and dividends normalized by book value of assets. The table also provides information on the number of firms available in our sample.[3] As we would expect, there is substantial variation in cash and dividends across countries.

We measure the rights granted to minority shareholders with the anti-director rights index of LLSV (1998).[4] This index takes values from zero to six, where countries with a value of six are those with the best protection of minority shareholder rights. We use a number of different indices to measure the quality of institutions that support the rights of investors. If the judiciary in a country works poorly or corruption is rampant, it will be difficult for investors to make use of their formal rights. We therefore use an index for the rule of law and an index for corruption. We obtain indices from the *International Country Risk Guide*. Data from this guide are available monthly for the 1990s. The corruption index assesses the risk of corruption of high government officials, while the rule of law index assesses the law and order tradition in a country. We also use the expropriation index used by LLSV (1998). The expropriation index measures the threat of outright confiscation or "forced nationalization." All these indices are normalized so that they take values from 1 through 10, with 10 corresponding to the highest level of investor protection.

[2] Another reason that our results for the period 1988–1998 are more reliable is that valuation is likely to be more consistent across countries because of reductions in barriers to international investment (see Stulz (2005)).

[3] The number of U.S. firms drops off sharply starting in 1998 because the CD version of Worldscope we use limited its coverage to roughly the 500 largest U.S. firms starting in 1998.

[4] LLSV (1998) state that "the index is formed by adding 1 when (1) the country allows shareholders to mail their proxy vote to the firm, (2) shareholders are not required to deposit their shares prior to the general shareholders' meeting, (3) cumulative voting or proportional representation of minorities in the board of directors is allowed, (4) an oppressed minorities mechanism is in place, (5) the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholders' meeting is less than or equal to 10% (the sample median), or (6) shareholders have preemptive rights that can be waived only by shareholders' vote." (p. 1123).

Table I
Worldscope Sample

Data are from 1988 to 1998 for all countries except India, Philippines, and Turkey, for which data begin in 1989, and Peru, for which data begin in 1992. Market to book is market value of equity plus book value of debt divided by the book value of assets. Dividends are common dividends and cash is cash plus marketable securities. All variables are divided by book value of assets. Each year, the median value of each variable for each country is calculated. The reported statistic is the mean of these time-series medians. The statistics relating to number of firms detail the distribution of firms in each country across years.

Country	Market to Book	Dividends	Cash	Mean No. of Firms Per Year	Median No. of Firms Per Year	Min No. of Firms Per Year	Max No. of Firms Per Year
Argentina	0.769	0.013	0.065	14.2	18	1	30
Australia	1.013	0.023	0.044	137.8	141	95	161
Austria	0.758	0.009	0.066	34.3	36	26	42
Belgium	0.809	0.013	0.089	57.6	57	51	65
Brazil	0.586	0.006	0.047	46.1	54	4	89
Canada	0.967	0.007	0.026	292.8	307	244	330
Chile	1.125	0.045	0.046	32.7	33	12	57
Denmark	0.889	0.009	0.138	88.6	99	46	104
Finland	0.817	0.009	0.080	58.8	58	33	73
France	0.711	0.008	0.085	309.8	319	208	354
Germany	0.822	0.011	0.056	272.1	271	180	323
Greece	1.164	0.026	0.037	40.4	40	9	79
Hong Kong	0.834	0.029	0.102	100.1	78	32	238
India	1.301	0.014	0.025	57.3	11	2	232
Ireland	0.947	0.014	0.094	37.0	39	27	42
Italy	0.655	0.010	0.089	104.8	105	55	127
Japan	1.014	0.005	0.160	1442.7	1,641	180	2,030
Korea (South)	0.783	0.004	0.064	101.3	86	13	197
Malaysia	1.344	0.014	0.055	140.3	149	39	263
Mexico	0.972	0.007	0.057	33.1	30	10	51
Netherlands	0.813	0.014	0.048	113.6	120	81	126
New Zealand	0.969	0.024	0.015	25.4	22	14	39
Norway	0.897	0.006	0.119	64.8	66	47	80
Peru	1.046	0.011	0.048	10.6	11	1	18
Philippines	1.290	0.003	0.076	22.0	22	2	49
Portugal	0.763	0.009	0.025	25.9	24	11	38
Singapore	1.013	0.013	0.138	75.9	73	26	140
South Africa	0.893	0.025	0.056	102.6	102	82	126
Spain	0.808	0.014	0.039	77.8	83	47	96
Sweden	0.861	0.013	0.092	89.6	100	53	111
Switzerland	0.821	0.011	0.108	88.5	81	67	108
Thailand	1.174	0.021	0.026	86.5	92	1	171
Turkey	1.389	0.042	0.094	13.2	15	2	22
United Kingdom	0.997	0.024	0.062	962.4	1,027	632	1,080
United States	1.151	0.008	0.044	1,751.2	1,974	326	2,256

We also use two broader proxies for the protection of investor rights. First, we use a country's political risk index from the *International Country Risk Guide*. A country's political risk level consists of 12 components that comprise the overall political risk assessment of a country. The corruption and the law

and order indices are two of the components of that index. Second, we use an index of political discretion, the Polcon V index (see Henisz (2000)). This index is available annually for our sample countries. The index is a continuous variable ranging from zero, indicating a dictatorship, to one, indicating democracy, and represents the degree to which checks and balances are present in a country's political system. The expectation is that investors are better protected when there are more checks and balances.

It is well known that measures of the enforcement of investor rights tend to be highly correlated with measures of economic development. This is also the case in our data set. For instance, the corruption index has a correlation of 0.76 with GDP per capita in our data set. We therefore want to investigate whether our measures of the enforcement of investor rights proxy for measures of economic development. Stock market turnover, stock market capitalization normalized by GDP, and total domestic credit outstanding (excluding government debt) normalized by GDP are common proxies for financial development. We therefore use each of these here. We use GDP per capita as our measure of economic development.

Table II reports the means of both our investor protection indices and our development measures. Western European countries, the United States, and Canada have high values for the indices of rights enforcement, but the European countries vary greatly in the values for the anti-director index. The countries with poor indices of rights enforcement are generally located in Asia and South America. Switzerland has the highest average GDP per capita over the sample period and India has the lowest. Though the financial development measures we use are standard in the literature, they lead to cross-country rankings that are not convincing. Germany has the highest ratio of stock market turnover, while Chile has the lowest. We also use the ratio of bond and stock market capitalization to GDP. This ratio is highest for Malaysia and lowest for Argentina. The United States ranks only as high as the third most financially developed country using this measure.

IV. The Market Value of Cash Holdings

To test our two hypotheses, we start by estimating the regression model given by equation (2). To control for heteroskedasticity, we deflate all variables by total assets. We follow Fama and French (1998) and estimate equation (2) using Fama–MacBeth (1973) regressions. To reduce the effect of outliers, we trim our sample at the 1% level by dropping 0.5% in each tail of each variable. Following Fama and French (1998), we trim based on the full sample so that while we trim 1% of the observations for each of 18 different variables, we lose only 8.6% of the total observations. Our final sample contains 75,887 firm years representing 12,339 unique firms.

Table III shows estimates of a regression that allows for different intercepts and slopes for countries with better investor protection. We use two indices of investor protection. The first index is the corruption index from the *International Country Risk Guide*. The second index is the anti-director rights index from LLSV (1998).

Table II

Means of Country-Level Variables Across Years

ICRGP, the overall political risk measure, *Corruption,* the level of government corruption, and *Law / Order,* the law-and-order tradition in each country, all come from the *International Country Risk Guide* (*ICRG*). We obtain *Polcon,* the PolconV measure of government centralization, from Henisz (2000) and both *Exprisk,* the risk of outright confiscation, and A*ntidirr,* an index measure of the protection of shareholder rights, from LLSV (1998). From the World Development Indicators we derive *Scap,* stock market capitalization to GDP, and *Sturn,* stock market turnover defined as annual total dollar amount traded divided by stock market capitalization. Bond market capitalization to GDP *(Bcap)* is from the Bank for International Settlements. *Tcap* is the sum of bond market capitalization and stock market capitalization to GDP. All variables are from 1988 to 1998 except for *Bcap* and *Tcap,* which start in 1989.

Country	ICRGP	Corruption	Law/Order	Polcon	Exprisk	Antidirr	Scap	Sturn	GDP	Bcap	Tcap
Argentina	73.51	4.73	7.60	0.70	5.91	4.00	0.12	0.35	7,171	0.02	0.14
Australia	81.05	8.33	10.00	0.87	9.27	4.00	0.60	0.41	20,028	0.15	0.76
Austria	85.88	8.11	10.00	0.74	9.69	2.00	0.13	0.60	28,489	0.31	0.45
Belgium	79.41	7.70	9.70	0.89	9.63	0.00	0.45	0.16	26,559	0.54	0.99
Brazil	66.57	5.60	5.42	0.74	7.62	3.00	0.19	0.46	4,281	0.12	0.37
Canada	82.96	10.00	10.00	0.86	9.67	5.00	0.61	0.46	19,430	0.11	0.74
Chile	73.12	5.57	7.65	0.71	7.50	5.00	0.79	0.09	4,083	0.14	0.98
Denmark	85.16	10.00	10.00	0.77	9.67	2.00	0.36	0.42	33,394	1.02	1.39
Finland	85.61	10.00	10.00	0.77	9.67	3.00	0.39	0.34	25,926	0.34	0.73
France	79.77	8.27	9.17	0.74	9.65	3.00	0.36	0.55	26,440	0.5	0.87
Germany	82.19	9.05	9.78	0.84	9.90	1.00	0.27	1.37	29,402	0.49	0.76
Greece	73.83	8.33	8.62	0.71	7.12	2.00	0.20	0.35	11,217	0.03	0.24
Hong Kong	72.44	7.82	6.84		8.29	5.00	1.97	0.51	20,919	0.07	2.11
India	63.03	4.96	6.56	0.74	7.75	5.00	0.27	0.39	360	0.01	0.27
Ireland	80.79	7.91	8.81	0.76	9.67	4.00	0.22	0.62	17,169	0.04	0.27
Italy	74.85	6.16	8.76	0.77	9.35	1.00	0.20	0.45	18,670	0.31	0.51
Japan	82.37	8.16	9.46	0.76	9.67	4.00	0.84	0.43	41,218	0.44	1.23

(*continued*)

Table II—*Continued*

Country	ICRGP	Corruption	Law/Order	Polcon	Exprisk	Antidirr	Scap	Sturn	GDP	Bcap	Tcap
Korea (South)	75.01	7.23	7.23	0.70	8.31	2.00	0.37	1.24	9,531	0.35	0.72
Malaysia	74.13	6.62	7.40	0.74	7.95	4.00	1.76	0.42	3,782	0.29	2.16
Mexico	69.38	4.76	4.92	0.33	7.29	1.00	0.28	0.40	3,269	0.01	0.31
Netherlands	86.04	10.00	10.00	0.75	9.98	2.00	0.76	0.56	26,151	0.24	1.03
New Zealand	83.48	9.49	9.93	0.74	9.69	4.00	0.43	0.28	15,711	0.00	0.44
Norway	84.55	9.58	10.00	0.77	9.88	4.00	0.27	0.54	31,957	0.23	0.51
Peru	54.49	5.00	4.62	0.39	5.54	3.00	0.19	0.32	2,181	0.02	0.23
Philippines	65.10	5.02	6.27	0.66	5.22	3.00	0.53	0.30	1,087	0.00	0.53
Portugal	77.69	8.16	8.82	0.75	8.90	3.00	0.21	0.38	10,509	0.12	0.34
Singapore	82.07	6.72	9.38	0.68	9.30	4.00	1.37	0.47	20,909	0.14	1.56
South Africa	66.30	8.17	4.36	0.51	6.88	5.00	1.41	0.11	3,968	0.15	1.56
Spain	73.70	7.21	8.59	0.75	9.52	4.00	0.34	0.70	14,604	0.15	0.49
Sweden	83.66	10.00	10.00	0.76	9.40	3.00	0.68	0.45	27,047	0.55	1.24
Switzerland	88.51	9.59	10.00	0.84	9.98	2.00	1.26	0.77	44,329	0.53	0.84
Thailand	68.87	4.70	8.24	0.73	7.42	2.00	0.50	0.79	2,406	0.08	0.61
Turkey	57.94	5.05	6.62	0.72	7.00	2.00	0.15	1.02	2,783	0.01	0.16
United Kingdom	80.36	8.31	9.13	0.74	9.71	5.00	1.17	0.51	18,721	0.18	1.37
United States	79.62	8.26	10.00	0.85	9.98	5.00	0.87	0.74	27,161	0.82	1.72

Table III

The Change in Value of Cash and Investor Protection

We estimate regressions using the method of Fama and MacBeth (1973). Each regression includes 11 cross-sections. Regressions are estimated independently for each subsample allowing coefficients on control variables to vary across subsamples. X_t is the level of variable X in year t divided by the level of assets in year t. dX_t is the change in the level of X from year $t-1$ to year t divided by total assets in year $t((X_t - X_{t-1})/A_t)$. dX_{t+1} is the change in the level of X from year $t+1$ to year t divided by assets in year $t((X_{t+1} - X_t)/A_t)$. A is the book value of assets. V is the market value of the equity plus the book value of debt. E is earnings defined as earnings before extraordinary items plus interest plus deferred tax credits plus investment tax credits. NA is net assets, which is defined as total assets minus cash. RD is research and development expense. When R&D is missing, it is set to zero. I is interest expense. D is common dividends. L is liquid assets, defined as cash and cash equivalents. Standard errors are in parentheses. The estimated regression is

$$V_{i,t} = \alpha + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNA_{i,t} + \beta_5 dNA_{i,t+1} + \beta_6 RD_{i,t} + \beta_7 dRD_{i,t} + \beta_8 dRD_{i,t+1} + \beta_9 I_{i,t} + \beta_{10} dI_{i,t} + \beta_{11} dI_{i,t+1} + \beta_{12} D_{i,t} + \beta_{13} dD_{i,t} + \beta_{14} dD_{i,t+1} + \beta_{15} dV_{i,t+1} + \beta_{16} dL_{i,t} + \beta_{17} dL_{i,t+1} + \varepsilon_{i,t}.$$

	High Corruption	Low Corruption	p-value of Difference	Poor Anti-director	Good Anti-director	p-value of Difference
Intercept	0.75	0.79	0.3498	0.60	0.83	0.0000
	(0.036)	(0.048)		(0.013)	(0.051)	
E_t	3.49	2.97	0.3403	2.37	3.02	0.1337
	(0.437)	(0.222)		(0.349)	(0.177)	
dE_t	−0.71	−0.28	0.1109	−0.77	−0.27	0.0069
	(0.320)	(0.110)		(0.204)	(0.116)	
dE_{t+1}	0.99	1.64	0.2756	0.44	1.50	0.0003
	(0.505)	(0.172)		(0.284)	(0.160)	
dNA_t	0.21	0.54	0.0085	0.16	0.50	0.0006
	(0.065)	(0.100)		(0.091)	(0.090)	
dNA_{t+1}	0.15	0.24	0.3624	0.04	0.13	0.3778
	(0.063)	(0.056)		(0.078)	(0.048)	
RD_t	−3.47	4.84	0.0000	0.40	5.16	0.0000
	(1.404)	(0.786)		(0.595)	(0.884)	
dRD_t	11.02	4.57	0.1421	4.25	4.78	0.7738
	(4.381)	(1.256)		(1.780)	(1.369)	
dRD_{t+1}	6.14	8.94	0.4902	4.33	9.36	0.0212
	(3.566)	(1.201)		(1.778)	(1.305)	
I_t	−4.18	−2.40	0.0001	−0.40	−2.89	0.0003
	(0.933)	(0.972)		(0.393)	(0.943)	
dI_t	1.66	−0.78	0.0047	0.47	−0.48	0.1908
	(0.547)	(0.888)		(0.899)	(0.540)	
dI_{t+1}	−1.44	−3.70	0.0330	−0.90	−2.26	0.0730
	(0.697)	(0.530)		(0.549)	(0.423)	
D_t	6.56	4.03	0.0014	9.80	4.07	0.0258
	(0.441)	(1.091)		(1.659)	(1.236)	
dD_t	−2.66	0.90	0.0774	−2.76	0.40	0.0353
	(1.687)	(0.552)		(1.394)	(0.443)	
dD_{t+1}	2.05	1.82	0.8218	4.03	−0.52	0.0136
	(0.914)	(0.686)		(1.568)	(1.015)	
dV_{t+1}	−0.11	0.06	0.1638	0.06	0.03	0.8185
	(0.093)	(0.048)		(0.120)	(0.041)	
dL_t	0.33	0.91	0.0094	0.29	0.95	0.0318
	(0.163)	(0.186)		(0.202)	(0.194)	
dL_{t+1}	0.23	0.69	0.0008	0.25	0.45	0.3662
	(0.107)	(0.121)		(0.159)	(0.136)	

When we use the corruption index, countries with better investor protection are countries where the corruption index is above its median value. We find that, as predicted, cash contributes significantly more to firm value in countries with better investor protection. Given our regression, we can evaluate the impact of a change in cash holdings keeping every other variable in the regression unchanged. Consequently, we can evaluate the impact of an increase in cash that brings about an increase in total assets by the same amount rather than an exchange of fixed assets for cash. A one-dollar increase in cash holdings is associated with an increase in firm value of \$0.33 in countries with high corruption and an increase of \$0.91 in countries with low corruption. We find that a one-dollar increase in noncash assets is associated with an increase in firm value of \$0.21 in countries with high corruption, but with an increase of \$0.54 in countries with low corruption. The regression is consistent with a greater discount for cash than for fixed assets in countries with poor institutions. We find that a dollar of cash contributes \$0.58 less to firm value in countries with poor institutions, while a dollar of physical assets contributes \$0.33 less. The regression provides no evidence that earnings are valued more in countries with low corruption or that firms have higher values in countries with low corruption irrespective of firm characteristics.

The second regression reported in Table III uses the anti-director index instead of the corruption index. This regression provides similar results in that there is a stronger relation between changes in cash and firm value for countries with better institutions. We find that an additional dollar of cash built up over the most recent year is associated with a change in firm value of \$0.29 in countries with a low anti-director index and a change of \$0.95 in countries with a high value of the index. Again, increases in other assets are discounted less in countries with poor investor protection than are increases in cash. However, in contrast to the regression that uses the corruption index, firms in countries with a high anti-director index are valued more irrespective of firm characteristics.

In sum, the two regressions reproduced in Table III provide strong support for Hypothesis 1. We now turn to Hypothesis 2. If cash is worth less in countries with high corruption, we would expect payouts to be worth more. In the regression that uses the corruption index as the index of investor protection, we find that the coefficient on the dividend payout is 6.56 in countries with high corruption and 4.03 in countries with low corruption. The difference between the two coefficients is significant at better than the 1% level.[5] In the regression with the anti-director index, the coefficient on the dividend payout is 9.80 for countries with a low value of the index and 4.07 in countries with a high value

[5] The joint tests of significance for the FM regressions are done using a stacked regression framework. We interact the dummy variable for investor protection with a constant and every independent variable and estimate that equation with the FM technique. Hence, the statistical significance reported is a t-test of whether the mean of the differences in the coefficients is zero rather than a test of whether the difference of the means is zero. This is more appropriate since it directly compares the coefficients by year and uses the standard error of those differences to derive statistical significance.

of the index. The difference has a p-value of 0.026. Both regressions support Hypothesis 2.

A concern with the regressions shown in Table III is that the increase in cash may change expectations about future growth as well. In principle, this should not be an issue since the Fama–French model includes lead variables to pick up expectations. However, one way to investigate this is to replace the lead and lag of cash changes with the level of cash, as follows:

$$\begin{aligned} V_{i,t} = {} & \alpha + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNA_{i,t} + \beta_5 dNA_{i,t+1} + \beta_6 RD_{i,t} \\ & + \beta_7 dRD_{i,t} + \beta_8 dRD_{i,t+1} + \beta_9 I_{i,t} + \beta_{10} dI_{i,t} + \beta_{11} dI_{i,t+1} + \beta_{12} D_{i,t} \\ & + \beta_{13} dD_{i,t} + \beta_{14} dD_{i,t+1} + \beta_{15} dV_{i,t+1} + \beta_{16} L_{i,t} + \varepsilon_{i,t}. \end{aligned} \tag{3}$$

With this equation, the coefficient on cash holdings measures the sensitivity of firm value to a one-dollar increase in cash holdings. Provided that the impact of a change in cash holdings on future cash flows is captured by the variables in the Fama–French model that capture expectations, the coefficient on cash holdings is an estimate of the market value of a dollar of cash.

The equations we estimate are similar to those estimated by Pinkowitz and Williamson (2005) for the United States, except that we allow the intercept and slopes to differ for countries with better institutions. In Table IV, we report estimates of the regression reported in equation (3) when investor protection is measured by corruption and by the anti-director index. In both cases, there is a significantly stronger (weaker) relation between firm value and cash (dividends) for countries with better investor protection than for other countries. Thus, this regression specification also supports our two hypotheses.

We estimate regressions using each of our investor protection indices in Table V. For brevity and ease of presentation, we only report the coefficients that are of direct interest.[6] Also, to facilitate comparison, we reproduce again the coefficients for the regressions of Tables III and IV. With our sample, we are able to estimate 11 cross-section regressions for all the investor protection proxies as well as GDP per capita. Due to data limitations, we have only 10 cross-sections to test for the relation between the value of cash and bond market capitalization or total capital market capitalization. In Panel A, we report the coefficients on changes in cash for the specification of Table III in the first two columns, and the coefficients on the level of cash for the specification of Table IV in the third and fourth columns.

First, for all our measures of investor protection, the coefficient on the change in cash is indistinguishable from one for countries with high investor protection and is significantly lower than one for the other countries. However, the difference between the two coefficients is significant only for the corruption index and the anti-director index. In contrast, when we use the level of cash, all the differences are significant.

We mention earlier that the indices of the enforcement of investor rights are highly correlated with economic development. We therefore investigate the

[6] Full results of the estimation are available upon request from the authors.

Table IV

The Value of Cash and Investor Protection

We estimate regressions using the method of Fama and MacBeth (1973). Each regression includes 11 cross-sections. Regressions are estimated independently for each subsample, allowing coefficients on control variables to vary across subsamples. X_t is the level of variable X in year t divided by the level of assets in year t. dX_t is the change in the level of X from year $t-1$ to year t divided by total assets in year t $((X_t - X_{t-1})/A_t)$. A is the book value of assets. dX_{t+1} is the change in the level of X from year t to year $t+1$ divided by assets in year t $((X_{t+1} - X_t)/A_t)$. V is the market value of the equity plus the book value of debt. E is earnings defined as earnings before extraordinary items plus interest plus deferred tax credits plus investment tax credits. NA is net assets, which is defined as total assets minus cash. RD is research and development expense. When R&D is missing, it is set to zero. I is interest expense. D is common dividends. L is liquid assets, defined as cash and cash equivalents. Standard errors are in parentheses. The estimated regression is

$$\begin{aligned} V_{i,t} = {} & \alpha + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNA_{i,t} + \beta_5 dNA_{i,t+1} + \beta_6 RD_{i,t} \\ & + \beta_7 dRD_{i,t} + \beta_8 dRD_{i,t+1} + \beta_9 I_{i,t} + \beta_{10} dI_{i,t} + \beta_{11} dI_{i,t+1} + \beta_{12} D_{i,t} \\ & + \beta_{13} dD_{i,t} + \beta_{14} dD_{i,t+1} + \beta_{15} dV_{i,t+1} + \beta_{16} L_{i,t} + \varepsilon_{i,t}. \end{aligned}$$

	High Corruption	Low Corruption	p-value of Difference	Low Anti-director	High Anti-director	p-value of Difference
Intercept	0.76	0.57	0.0000	0.56	0.63	0.0152
	(0.037)	(0.036)		(0.017)	(0.031)	
E_t	3.58	3.02	0.3316	2.25	3.04	0.0718
	(0.457)	(0.223)		(0.371)	(0.170)	
dE_t	−0.68	−0.21	0.0750	−0.66	−0.21	0.0300
	(0.309)	(0.121)		(0.207)	(0.129)	
dE_{t+1}	1.04	1.80	0.2215	0.47	1.60	0.0004
	(0.527)	(0.171)		(0.325)	(0.155)	
dNA_t	0.18	0.66	0.0000	0.19	0.61	0.0000
	(0.057)	(0.088)		(0.095)	(0.085)	
dNA_{t+1}	0.15	0.19	0.7074	0.03	0.11	0.3900
	(0.065)	(0.054)		(0.078)	(0.044)	
RD_t	−3.43	4.35	0.0000	0.23	4.66	0.0000
	(1.394)	(0.777)		(0.586)	(0.901)	
dRD_t	11.35	4.17	0.1042	4.42	4.43	0.9972
	(4.432)	(1.230)		(1.844)	(1.355)	
dRD_{t+1}	6.22	8.35	0.6027	4.34	8.69	0.0435
	(3.569)	(1.231)		(1.770)	(1.313)	
I_t	−4.42	1.06	0.0000	0.12	−0.07	0.6466
	(0.980)	(0.927)		(0.431)	(0.659)	
dI_t	1.95	−1.60	0.0001	0.16	−1.17	0.0560
	(0.566)	(0.874)		(0.901)	(0.597)	
dI_{t+1}	−1.46	−2.22	0.4627	−0.83	−1.71	0.1919
	(0.781)	(0.471)		(0.559)	(0.395)	
D_t	6.38	4.58	0.0126	9.87	4.60	0.0311
	(0.455)	(0.954)		(1.658)	(1.085)	
dD_t	−2.59	0.15	0.1700	−2.83	−0.17	0.0483
	(1.730)	(0.538)		(1.335)	(0.444)	
dD_{t+1}	2.25	1.74	0.6331	4.16	−0.22	0.0138
	(0.916)	(0.763)		(1.567)	(0.924)	
dV_{t+1}	−0.10	0.08	0.1151	0.07	0.05	0.8566
	(0.093)	(0.043)		(0.116)	(0.040)	
L_t	−0.03	1.24	0.0000	0.39	1.17	0.0000
	(0.069)	(0.100)		(0.048)	(0.123)	

Table V

The Value of Cash, Institutional Quality, and Investor Protection

We estimate regressions using the method of Fama and MacBeth (1973). The definitions of the variables in the regressions are given in Tables III and IV. Each regression includes 11 cross-sections except the regressions classifying countries using bond and total market capitalizations, which have 10. Separate regressions are run independently for each subsample, thus, the intercept and all the slopes are allowed to vary across the subsamples. Countries with a high level of investor protection are countries with an index of investor protection above the country median and those with a low level of protection have index below the country median. Standard errors are in parentheses. *, **, *** indicates significant difference between the high and low coefficient at the 10%, 5%, and 1% significance levels, respectively.

Change in Cash Regressions

$$\begin{aligned} V_{i,t} = {} & \alpha + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNA_{i,t} + \beta_5 dNA_{i,t+1} + \beta_6 RD_{i,t} \\ & + \beta_7 dRD_{i,t} + \beta_8 dRD_{i,t+1} + \beta_9 I_{i,t} + \beta_{10} dI_{i,t} + \beta_{11} dI_{i,t+1} + \beta_{12} D_{i,t} \\ & + \beta_{13} dD_{i,t} + \beta_{14} dD_{i,t+1} + \beta_{15} dV_{i,t+1} + \beta_{16} dL_{i,t} + \beta_{17} dL_{i,t+1} + \varepsilon_{i,t} \end{aligned}$$

Level of Cash Regressions

$$\begin{aligned} V_{i,t} = {} & \alpha + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNA_{i,t} + \beta_5 dNA_{i,t+1} + \beta_6 RD_{i,t} \\ & + \beta_7 dRD_{i,t} + \beta_8 dRD_{i,t+1} + \beta_9 I_{i,t} + \beta_{10} dI_{i,t} + \beta_{11} dI_{i,t+1} + \beta_{12} D_{i,t} \\ & + \beta_{13} dD_{i,t} + \beta_{14} dD_{i,t+1} + \beta_{15} dV_{i,t+1} + \beta_{16} L_{i,t} + \varepsilon_{i,t} \end{aligned}$$

Panel A: Cash Holdings

	Change in Cash Regressions		Level of Cash Regressions	
Institution Quality	High (β_{16})	Low (β_{16})	High (β_{16})	Low (β_{16})
Corruption	0.91***	0.33	1.24***	−0.03
	(0.186)	(0.163)	(0.100)	(0.069)
Polcon	0.97	0.63	1.18***	0.78
	(0.234)	(0.152)	(0.129)	(0.065)
ICRGP	0.90	0.45	1.19***	0.18
	(0.199)	(0.189)	(0.102)	(0.081)
Rule of law	0.91	0.44	1.20***	0.26
	(0.193)	(0.200)	(0.100)	(0.091)
Expropriation	0.90	0.39	1.17***	0.54
	(0.203)	(0.158)	(0.103)	(0.102)
Anti-director rights	0.95**	0.29	1.17***	0.39
	(0.194)	(0.202)	(0.123)	(0.048)
Financial Development	High (β_{16})	Low (β_{16})	High (β_{16})	Low (β_{16})
Stock market turnover	1.00***	0.45	1.30***	0.73
	(0.207)	(0.134)	(0.132)	(0.084)
Stock market	0.95***	0.27	1.22***	0.21
capitalization to GDP	(0.188)	(0.139)	(0.106)	(0.065)
Bond market	0.91	0.92	1.13	1.01
capitalization to GDP	(0.181)	(0.288)	(0.129)	(0.154)
Total market	0.91	0.92	1.16**	0.71
capitalization to GDP	(0.184)	(0.252)	(0.114)	(0.137)
Economic development	High (β_{16})	Low (β_{16})	High (β_{16})	Low (β_{16})
GDP per capita	0.87	0.43	1.15***	0.53
	(0.193)	(0.212)	(0.103)	(0.116)

(continued)

Table V—*Continued*

Panel B: Dividends				
	Change in Cash Regressions		Level of Cash Regressions	
Institution Quality	High (β_{12})	Low (β_{12})	High (β_{12})	Low (β_{12})
Corruption	4.03***	6.56	4.58**	6.38
	(1.091)	(0.441)	(0.954)	(0.455)
Polcon	4.52***	7.87	5.15**	7.70
	(0.998)	(1.558)	(0.836)	(1.560)
ICRGP	4.26	6.25	4.81	6.02
	(1.119)	(0.295)	(0.948)	(0.259)
Rule of law	4.26	6.36	4.81	6.13
	(1.117)	(0.339)	(0.948)	(0.308)
Expropriation	4.15*	6.43	4.68	6.40
	(1.152)	(0.452)	(0.972)	(0.465)
Anti-director rights	4.07**	9.80	4.59**	9.87
	(1.236)	(1.659)	(1.085)	(1.658)
Financial Development	High (β_{12})	Low (β_{12})	High (β_{12})	Low (β_{12})
Stock market turnover	3.87***	7.16	4.09***	7.49
	(1.101)	(0.789)	(0.882)	(0.846)
Stock market	4.10***	10.31	4.56***	10.16
Capitalization to GDP	(1.165)	(1.334)	(1.028)	(1.334)
Bond market	5.67	5.93	6.26	5.49
Capitalization to GDP	(1.074)	(0.901)	(0.927)	(0.886)
Total market	5.13	6.12	5.56	5.72
Capitalization to GDP	(1.053)	(0.919)	(0.917)	(0.928)
Economic development	High (β_{12})	Low (β_{12})	High (β_{12})	Low (β_{12})
GDP per capita	4.52	5.85	4.92	5.69
	(1.112)	(0.439)	(0.960)	(0.397)

relation between the value of cash holdings and measures of economic and financial development. We use four variables as proxies for the degree of financial development: stock market turnover, stock market capitalization, corporate bond market capitalization, and total market (stock plus bond) capitalization. For normalization purposes, all of the variables except turnover are deflated by the annual GDP of the country. We use annual GDP per capita as our measure of economic development. We find that cash holdings are valued more in countries with higher financial development and higher economic development.

The result that cash is worth more in countries with a higher level of financial and economic development raises the concern that the higher value of cash in countries with better investor protection is due to development rather than investor protection. *A priori*, this seems implausible. If cash is worth little when managers maximize firm value, they would want to decrease their cash holdings either by investing the funds or by paying them out. Consequently, we believe that cash is worth less in countries with a low level of development precisely because these countries have poor investor protection. We explore this issue more in the next section.

In Panel B, we report results on the value of dividends. For all of our indices, dividends are worth more in countries with poorer investor protection, therefore supporting Hypothesis 2. The difference in coefficients is significant for all indices except the rule of law index and the political risk index when we use the change in cash regressions. In addition, the difference is not significant for the expropriation index when we use the cash level regressions. The difference in coefficients is significant for only two of the four measures of financial development and is not significant for the measure of economic development. Thus, the concern we have that the valuation differences for cash might be due to differences in economic and financial development does not seem to be pertinent for the valuation of dividends.

V. Alternative Explanations

We investigate two sets of alternative explanations for our results. First, we assume that the coefficient on cash is significantly higher in high investor protection countries and the coefficient on dividends is significantly lower in these countries, and consider other possible interpretations for the results. Second, we address the possibility that the significance of our results is misstated.

A. Alternative Interpretations of the Coefficients

A legitimate concern about our results is that the low coefficients on cash holdings and high coefficients on dividends for countries with poor institutions could be explained in other ways than through the impact of poor investor protection on agency costs. We investigate four possible explanations using subsets of firms. It is important to reiterate that, while such an approach is instructive, it is also limited by the fact that the number of firms and the number of countries differ across subsets. Countries with poor economic development and poor investor protection typically have few firms. There are also few countries with poor economic development but high investor protection.

First, a possible alternative explanation for our results for cash holdings is simply that investors believe that accounting statements misrepresent cash holdings more in countries with poor investor protection than in countries with good investor protection. To the extent that firms represent cash holdings to be higher than they actually are, this suggests that the slope coefficient on cash should be lower in countries where misrepresentation is higher. However, in that case, if we had the correct amount of cash, the slope coefficient might not be different from what it is for countries with no misrepresentation. We use the accounting index of LLSV (1998) to investigate whether lack of transparency alone could explain our cash result. In other words, we verify whether cash is valued as much in high corruption countries with an above-median value of the accounting index as it is in low corruption countries with an above-median value of the accounting index. This way of dividing the sample gives us four groups of firms. Since we therefore have four slope coefficients on cash holdings,

we only allow the intercept and the coefficients on cash holdings and dividends to differ. The results are shown in regression (1) of Table VI, Panel A when we use the change in cash and in regression (1) of Panel B when we use the level of cash. Note that an above-median accounting index is not sufficient for the slopes on the change in cash or the level of cash to be close to one. The differences in slopes across subgroups are significant when we use the level of cash, but not when we use changes in cash. The difficulty with this experiment is that there are few firms that belong to countries with an above-median value of the accounting index and a below-median value of the corruption index in regression (2). Similar results hold when we use the anti-director index rather than corruption. We reproduce results for dividends for completeness. Among countries with good accounting standards, the coefficient on dividends is higher in countries with poorer investor protection, but the difference is significant only for the corruption index. When we turn to countries with poor accounting standards, we obtain the puzzling result that dividends contribute less to firm value in countries with a low corruption index than in countries with a higher corruption index.

Second, there could be a negative correlation between the extent to which dividends are tax disadvantaged and investor protection. It is therefore possible that cash could be worth less in countries with poor investor protection because it would be more heavily taxed when paid out to shareholders. If this were the case, however, the coefficient on dividends would be extremely puzzling. Nevertheless, we investigate this possibility. There is a weak negative relation between the dividend preference measure of LLSV (2000b) and the investor protection indices. To account for differences in the tax treatment of dividends, we split the sample of countries into four groups based on dividend tax treatment and the corruption index. Regression (3) of Table VI, Panels A and B shows that the coefficient on cash is higher in countries with less corruption compared to countries with more corruption irrespective of whether we look at countries with a tax advantage or a tax disadvantage for dividends (but the difference is not significant for the countries with a dividend tax advantage with the change in cash regressions). We proceed in the same way using the anti-director index instead of the corruption index. The results are reproduced in regression (4). Again, the result that cash has a higher coefficient in countries with better minority shareholder protection holds when the comparison is made across countries in which dividends have a similar tax status. Turning to dividends, we find that they contribute more to firm value in countries with poor investor protection after controlling for the tax treatment of dividends (but significantly so only for countries in which dividends are tax disadvantaged in the change in cash regressions).[7]

[7] It is not clear how to interpret the result that the coefficient on dividends is higher in countries with a tax disadvantage for dividends. One possibility is that a tax disadvantage for dividends implicitly subsidizes the consumption of private benefits, making dividends more valuable for minority shareholders at the margin.

Table VI

Dual Splits

We estimate regressions using the method of Fama and MacBeth (1973). The definitions of the variables in the regressions are given in Tables III and IV. Each regression includes 11 cross-sections except the regressions using bond and total market capitalizations, which have 10. The regressions are estimated using the whole sample, but only the coefficients on dividends and cash are allowed to vary. The regressions use the median values of two variables to split the sample into four subsets: $LowHi_{i,t}$, $LowLow_{i,t}$, $HiHi_{i,t}$, and $HiLow_{i,t}$. Standard errors are in parentheses. The number of observations in each cell is given in brackets, while the number of countries represented in the cell is given in braces.

Panel A Regressions: Change in Cash Regressions

$$\begin{aligned} V_{i,t} = {} & \alpha + \alpha_1 LowHi + \alpha_2 HiLow + \alpha_3 HiHi + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNA_{i,t} \\ & + \beta_5 dNA_{i,t+1} + \beta_6 RD_{i,t} + \beta_7 dRD_{i,t} + \beta_8 dRD_{i,t+1} + \beta_9 I_{i,t} + \beta_{10} dI_{i,t} + \beta_{11} dI_{i,t+1} \\ & + \beta_{12}(LowLow_{i,t} \times D_{i,t}) \beta_{13}(LowHi_{i,t} \times D_{i,t}) + \beta_{14}(HiLow_{i,t} \times D_{i,t}) \\ & + \beta_{15}(HiHi_{i,t} \times D_{i,t}) + \beta_{16} dD_{i,t} + \beta_{17} dD_{i,t+1} + \beta_{18} dV_{i,t+1} + \beta_{19}(LowLow_{i,t} \times dL_{i,t}) \\ & + \beta_{20}(LowHi_{i,t} \times dL_{i,t}) + \beta_{21}(HiLow_{i,t} \times dL_{i,t}) + \beta_{22}(HiHi_{i,t} \times dL_{i,t}) + \beta_{23} dL_{i,t+1} + \varepsilon_{i,t} \end{aligned}$$

Panel B Regressions: Level of Cash Regressions

$$\begin{aligned} V_{i,t} = {} & \alpha + \alpha_1 LowHi + \alpha_2 HiLow + \alpha_3 HiHi + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNA_{i,t} \\ & + \beta_5 dNA_{i,t+1} + \beta_6 RD_{i,t} + \beta_7 dRD_{i,t} + \beta_8 dRD_{i,t+1} + \beta_9 I_{i,t} + \beta_{10} dI_{i,t} + \beta_{11} dI_{i,t+1} \\ & + \beta_{12}(LowLow_{i,t} \times D_{i,t}) + \beta_{13}(LowHi_{i,t} \times D_{i,t}) + \beta_{14}(HiLow_{i,t} \times D_{i,t}) \\ & + \beta_{15}(HiHi_{i,t} \times D_{i,t}) + \beta_{16} dD_{i,t} + \beta_{17} dD_{i,t+1} + \beta_{18} dV_{i,t+1} + \beta_{19}(LowLow_{i,t} \times L_{i,t}) \\ & + \beta_{20}(LowHi_{i,t} \times L_{i,t}) + \beta_{21}(HiLow_{i,t} \times L_{i,t}) + \beta_{22}(HiHi_{i,t} \times L_{i,t}) + \varepsilon_{i,t} \end{aligned}$$

Panel A: Change in Cash Regressions

	(1) Corruption			(2) Anti-director Rights		
	Cash	Dividends	N	Cash	Dividends	N
Good accounting standards	1.05	3.64	[59,833]	1.02	4.16	[62,165]
Good Protection	(0.200)	(1.292)	{13}	(0.192)	(1.149)	{16}
Good accounting standards	0.66	6.71	[5,506]	0.26	5.53	[3,174]
Poor protection	(0.255)	(0.820)	{6}	(0.406)	(0.970)	{3}
p-value difference of coefficients	0.2573	0.0789		0.0918	0.1679	
Poor accounting standards	0.22	10.94	[5,074]	−0.88	6.60	[1,955]
Good protection	(0.213)	(1.384)	{5}	(1.207)	(2.146)	{6}
Poor accounting standards	−0.30	5.46	[5,067]	0.07	8.71	[8,186]
Poor protection	(0.331)	(1.536)	{10}	(0.180)	(1.146)	{9}
p-value difference of coefficients	0.1891	0.0196		0.4421	0.4326	
	(3) Corruption			(4) Anti-director Rights		
	Cash	Dividends	N	Cash	Dividends	N
Dividend tax advantage	0.73	4.16	[11,761]	0.74	4.17	[11,080]
Good Protection	(0.320)	(0.989)	{9}	(0.285)	(0.982)	{12}
Dividend tax advantage	0.44	5.54	[3,759]	−0.06	6.52	[4,440]
Poor protection	(0.297)	(1.009)	{7}	(0.276)	(1.222)	{4}
p-value difference of coefficients	0.5173	0.3734		0.0394	0.1335	
Dividend tax disadvantage	1.01	5.18	[52,702]	1.02	5.43	[52,506]
Good protection	(0.207)	(1.526)	{8}	(0.200)	(1.513)	{8}
Dividend tax disadvantage	0.54	13.36	[6,280]	0.23	10.96	[6,476]
Poor protection	(0.269)	(1.250)	{7}	(0.218)	(1.101)	{7}
p-value difference of coefficients	0.0845	0.0000		0.0000	0.0000	

(continued)

Table VI—*Continued*

	(5) Corruption			(6) Anti-director Rights		
	Cash	Dividends	*N*	Cash	Dividends	*N*
Low leverage	1.27	5.11	[34,187]	1.23	5.18	[33,822]
Good protection	(0.266)	(1.016)	{varies}	(0.263)	(1.088)	{varies}
Low leverage	0.31	7.34	[5,092]	0.29	9.51	[5,457]
Poor protection	(0.255)	(0.873)	{varies}	(0.302)	(1.032)	{varies}
p-value difference of coefficients	0.0005	0.0026		0.0061	0.0095	
High leverage	0.30	1.68	[30,720]	0.30	1.38	[30,705]
Good protection	(0.117)	(1.679)	{varies}	(0.108)	(1.530)	{varies}
High leverage	0.26	4.17	[5,888]	−0.04	6.06	[5,903]
Poor protection	(0.381)	(1.273)	{varies}	(0.203)	(1.099)	{varies}
p-value difference of coefficients	0.9085	0.2339		0.1022	0.0405	
	(7) Corruption			(8) Anti-director Rights		
	Cash	Dividends	*N*	Cash	Dividends	*N*
Low GDP per capita	0.09	5.89	[2,137]	0.34	5.64	[6,283]
Good protection	(0.415)	(1.412)	{4}	(0.351)	(1.240)	{11/12}
Low GDP per capita	0.30	5.24	[7,399]	0.06	3.83	[3,253]
Poor protection	(0.410)	(1.144)	{13}	(0.500)	(1.260)	{5/6}
p-value difference of coefficients	0.7435	0.5210		0.6859	0.1365	
High GDP per capita	1.02	4.21	[62,774]	1.04	3.98	[58,244]
Good Protection	(0.198)	(1.231)	{14}	(0.195)	(1.155)	{11/12}
High GDP per capita	0.32	7.72	[3581]	0.23	10.58	[8,107]
Poor protection	(0.142)	(1.173)	{4}	(0.174)	(0.704)	{6/7}
p-value difference of coefficients	0.0000	0.0590		0.0000	0.0000	
Panel B: Level of Cash Regressions						
	(1) Corruption			(2) Anti-director Rights		
	Cash	Dividends	*N*	Cash	Dividends	*N*
Good accounting standards	1.24	4.21	[59,833]	1.19	4.64	[62,165]
Good protection	(0.100)	(1.121)	{13}	(0.116)	(0.998)	{16}
Good accounting standards	0.35	6.96	[5,506]	0.37	5.77	[3,174]
Poor protection	(0.136)	(0.881)	{6}	(0.261)	(0.984)	{3}
p-value difference of coefficients	0.0000	0.1126		0.0167	0.3419	
Poor accounting standards	0.50	11.20	[5,074]	−0.57	7.11	[1,955]
Good protection	(0.135)	(1.423)	{5}	(0.666)	(2.302)	{6}
Poor accounting standards	−0.19	6.13	[5,067]	0.28	9.27	[8,186]
Poor protection	(0.078)	(1.522)	{10}	(0.101)	(1.203)	{9}
p-value difference of coefficients	0.0000	0.0343		0.2428	0.4620	
	(3) Corruption			(4) Anti-director Rights		
	Cash	Dividends	*N*	Cash	Dividends	*N*
Dividend tax advantage	1.07	4.23	[11,761]	1.10	4.15	[11,080]
Good protection	(0.140)	(0.922)	{9}	(0.137)	(0.920)	{12}
Dividend tax advantage	0.41	5.55	[3,759]	−0.20	7.22	[4,440]
Poor protection	(0.111)	(1.098)	{7}	(0.188)	(1.376)	{4}
p-value difference of coefficients	0.0000	0.3935		0.0000	0.0576	
Dividend tax disadvantage	1.16	5.81	[52,702]	1.16	6.09	[52,506]
Good protection	(0.123)	(1.326)	{8}	(0.132)	(1.321)	{8}
Dividend tax disadvantage	0.07	14.63	[6,280]	0.50	11.72	[6,476]
Poor protection	(0.157)	(1.225)	{7}	(0.113)	(1.093)	{7}
p-value difference of coefficients	0.0000	0.0000		0.0000	0.0000	

(continued)

Table VI—*Continued*

	(5) Corruption			(6) Anti-director Rights		
	Cash	Dividends	*N*	Cash	Dividends	*N*
Low leverage	1.31	5.35	[34,187]	1.27	5.44	[33,822]
Good protection	(0.098)	(0.911)	{varies}	(0.115)	(1.143)	{varies}
Low leverage	0.27	7.51	[5,092]	0.51	9.50	[5,457]
Poor protection	(0.123)	(0.824)	{varies}	(0.115)	(1.143)	{varies}
p-value difference of coefficients	0.0000	0.0044		0.0000	0.0192	
High leverage	0.81	2.82	[30,720]	0.79	2.49	[30,705]
Good protection	(0.160)	(1.400)	{varies}	(0.173)	(1.253)	{varies}
High leverage	0.04	4.62	[5,888]	0.02	6.73	[5,903]
Poor protection	(0.116)	(1.372)	{varies}	(0.111)	(1.120)	{varies}
p-value difference of coefficients	0.0000	0.3710		0.0001	0.0417	
	(7) Corruption			(8) Anti-director Rights		
	Cash	Dividends	*N*	Cash	Dividends	*N*
Low GDP per capita	0.39	6.52	[2,137]	0.93	5.84	[6,283]
Good protection	(0.266)	(1.411)	{4}	(0.183)	(1.306)	{11/12}
Low GDP per capita	0.63	5.72	[7,399]	−0.03	4.55	[3,253]
Poor protection	(0.158)	(1.147)	{13}	(0.483)	(1.187)	{5/6}
p-value difference of coefficients	0.4438	0.4783		0.0529	0.2916	
High GDP per capita	1.18	4.80	[62,774]	1.18	4.51	[58,244]
Good protection	(0.100)	(1.026)	{14}	(0.114)	(0.980)	{11/12}
High GDP per capita	0.05	8.33	[3,581]	0.24	11.20	[8,107]
Poor protection	(0.115)	(1.151)	{4}	(0.067)	(0.848)	{6/7}
p-value difference of coefficients	0.0000	0.0416		0.0000	0.0000	

The third possible explanation we investigate is that there might be a positive relation between cash holdings and the value of debt for highly levered firms. In this case, an increase in cash would not benefit shareholders as much for highly levered firms as for less levered firms. However, because we do not use the market value of debt, the relation between cash holdings and firm value would be attenuated. If a firm in our sample is more likely to have low leverage in a country with better investor protection, this could explain our result. In regressions (5) and (6), we proceed as we did for regressions (1) and (2) but instead of splitting the sample according to accounting quality, we split it according to leverage. We define leverage as short-term debt plus long-term debt divided by total assets. We find that with low leverage, firms in countries with low corruption have a much higher coefficient on cash holdings than do firms with low leverage in countries with high corruption. For firms with high leverage, the coefficient is significantly higher in countries with low corruption in the regression that uses the level of cash but not in the one that uses the change in cash. When we use the anti-director index, we get nearly identical results, except that almost all differences are significant. The results for dividends are equally supportive of our hypothesis.

The fourth possible explanation we consider is that our results may simply reflect differences in economic development. We therefore split the sample into high and low GDP per capita countries as well as high corruption and low corruption countries. Regression (7) shows that the difference in the

relation between value and cash holdings appears to hold only in highly developed economies. In low GDP per capita countries, there is no difference in the value of cash holdings based on corruption. However, as regression (8) shows, when we divide the sample according to the anti-director index instead of corruption, we see that cash is more highly valued in countries with good investor protection regardless of the degree of economic development when we use the level of cash. For dividends, however, there are no significant differences for low GDP countries, but there are significant differences for high GDP countries.

The regression results in Table VI generally support our hypotheses. However, it is also clear that the evidence is stronger for the anti-director index than it is for corruption. This result does not appear to be due to the obvious limitation of the exercise we conduct in Table VI, which is that countries with poor investor protection have fewer firms and thus some of the subsets we investigate have fewer firm-years compared to others.

B. Robustness of the Results

While we have already examined the robustness of our results in a number of ways, we discuss statistical issues in this subsection. As Fama and French (1998) point out, there are many good reasons to use the Fama and MacBeth (1973) approach to estimate regressions such as ours. This approach addresses the pervasive problem that there are clusters of observations within cross-sections and across time. However, one can also take clustering into account by estimating a pooled time-series cross-section regression and allowing for clustering. Such an approach requires assumptions about the variance–covariance matrix of the error terms. Here, we reestimate the regressions of Tables III and IV using three different assumptions about the variance–covariance matrix. First, we allow for serial correlation with one lag in the error terms using the Newey–West (1987) correction. Second, we allow for clustering by country and year, where the error terms for firms in the same country but different years are assumed to be independent. Finally, we allow for clustering within a country across all years.

We do not reproduce the coefficient estimates and their standard errors in a table. Because we pool all observations instead of using the Fama–MacBeth approach, the coefficient estimates change slightly, but these changes have no bearing on our conclusions. When it comes to our various assumptions about the variance–covariance matrix of the residuals, we find that more differences are significant when we only correct for serial correlation in the residuals. It is clearly important to correct for clustering by country. Further, clustering by both year and country leads to more differences being significant than those reported with our Fama–MacBeth estimates for the regressions with changes in cash. For instance, the difference between the coefficients when we use the Polcon V index is not significant with the Fama–MacBeth regressions but is significant with country clustering. Finally, when we use country clustering

across time, some differences that are significant using the Fama–MacBeth regressions lose significance. For changes in cash, the differences using the corruption index, bond market capitalization, and GDP per capita are no longer significant. When we use the level of cash, all differences that are significant using the Fama–MacBeth regressions are significant under all our assumptions about the variance–covariance matrix of residuals. Turning to dividends, the difference in coefficients loses significance when we cluster by countries and time for the corruption index, the expropriation index, and bond market capitalization.

The pooled regressions that allow for clustering within countries across time subject our hypotheses to a test that is a bit extreme since we have few independent clusters compared to the numbers of coefficients we estimate. Nevertheless, with these regressions all of our results using the anti-director index hold. A sensible approach is to reestimate the regressions but force all coefficients to be the same across high and low investor protection countries except for the coefficients on cash and dividends. This approach increases the ratio of the number of independent clusters to the number of estimated coefficients. Using this approach, more differences are significant than using the Fama–MacBeth regressions when we allow for clustering within countries across time.

A concern with respect to the Fama and MacBeth (1973) regressions that Fama and French (1998) raise is that the coefficients in the cross-section regressions may be serially correlated. If that is the case, our estimates of the significance of the average coefficients would be overstated. We investigate the serial correlation of the coefficients on the change in cash and dividends of Table III and on the level of cash and dividends of Table IV. Up to lag five, we find no significant serial correlation. Our approach has power in that we find, for instance, that the coefficient on R&D has significant serial correlation at lag one. Nonetheless, for completeness, we recompute the Fama–MacBeth standard errors assuming that there is serial correlation, up to lag three, in the time series of coefficients.[8] With this assumption, our standard errors are virtually identical to the ones reported in the tables that correspond to the Fama–MacBeth regressions. We therefore conclude that our significance levels are unlikely to be overstated because of serial correlation in the coefficient estimates in the cross-section.

VI. Conclusion

In this paper, we examine how the ease with which controlling shareholders can extract private benefits from the firms they control affects firm valuation across 35 countries over 11 years. We test two hypotheses. The first hypothesis is that minority shareholders value cash holdings less in countries with weaker investor protection than in other countries. The second hypothesis is

[8] To operationalize this, we take the time series of coefficients and estimate a regression of those coefficients on a constant allowing for Newey–West (1987) standard errors.

that minority shareholders value dividends more in countries with worse investor protection than in other countries. Both hypotheses follow from agency theories that state that controlling shareholders will extract more private benefits from the firm they control if investor protection is weak. We investigate both hypotheses using various specifications of Fama and French's (1998) valuation regressions. Since our evidence is strongly supportive of these hypotheses, it implies that differences in the intensity of agency problems across countries play an important role in differences in the valuations of firms across countries.

Appendix
Variable, Definitions, and Sources

Variable	Definition	Source
Inflation	Consumer price index	World Bank's World Development Indicators
Stock market capitalization	Total stock market value normalized by GDP	World Bank's World Development Indicators
Stock market volatility	Standard deviation of prior 60 months of country stock market index	Datastream
Stock market turnover	Total stock value traded divided by stock market capitalization normalized by GDP	World Bank's World Development Indicators
Bond market capitalization to GDP	Total debt outstanding, excluding government debt normalized by GDP	Bank for International Settlements
Log (GDP per capita)	Log of country gross domestic product	World Bank's World Development Indicators
ICRGP	Measure of political stability based on a specific list of country risk factors	*International Country Risk Guide*
Polcon	Measure of political concentration of power within a country	Polcon V from Henisz (2000)
Corruption	Assessment of corruption within a country that threatens development	*International Country Risk Guide*
Law and order	Assessment of the strength and impartiality of the legal system and observance of the law	*International Country Risk Guide*
Anti-director index	Index that measures the degree to which shareholder rights are protected	LLSV (1998)
Expropriation risk	Threat of outright confiscation or forced nationalization	LLSV (1998)
Civil law	Measure of legal tradition in a country	LLSV (1998)

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