International Corporate Governance and Corporate Cash Holdings

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Abstract

Agency problems are an important determinant of corporate cash holdings. For a sample of more than 11,000 firms from 45 countries, we find that corporations in countries where shareholders rights are not well protected hold up to twice as much cash as corporations in countries with good shareholder protection. In addition, when shareholder protection is poor, factors that generally drive the need for cash holdings, such as investment opportunities and asymmetric information, actually become less important. These results are stronger after controlling for capital market development. Indeed, consistent with the importance of agency costs, we find that firms hold larger cash balances when access to funds is easier. Our evidence is consistent with the conjecture that investors in countries with poor shareholder protection cannot force managers to disgorge excessive cash balances.

I.   Introduction

At the end of 1998, the largest corporations around the world (as listed on the Global Vantage database) held $1.5 trillion of cash and cash equivalents, which is almost 9% of the book value of their assets and slightly above 9% of the market value of their equity. These numbers indicate that investments in cash are important for corporations. Until recently, however, scholars paid relatively little direct attention to the causes and consequences of corporate cash holdings. Instead, transactions costs were assumed to be the major determinant of cash levels and firms with a higher marginal cost of cash shortfalls were expected to hold more cash (see, for example, Miller and Orr (1966), Meltzer (1993), and Mulligan (1997)). With few exceptions, discussions of other factors that could affect cash holdings were not the central theme of research.

Opler, Pinkowitz, Stulz, and Williamson (1999) considerably expand the evidence on the determinants of corporate cash holdings. They consider two broad explanations for cash holdings, which have their antecedents in the capital structure literature: the tradeoff theory and the financing hierarchy theory. The tradeoff theory suggests that firms trade off the costs and benefits of holding cash to derive optimal cash levels. In this context, they do not only consider the transaction costs motive described earlier, but also the effect of asymmetric information, and the agency costs of outside financing on the demand for cash holdings. The financing hierarchy theory suggests that there is no optimal amount of cash, based on arguments similar to the pecking order theory of capital structure. Levels of debt decrease and cash increase as the firm becomes more profitable and does not demand external financing.

Opler et al. (1999) examine the tradeoff and hierarchy views of corporate cash holdings for all firms on the Compustat database over the period 1952–1994. They find substantial support for the tradeoff model. Firms hold more cash when they are smaller, have higher investment and R&D expenditures, better investment opportunities, when they have higher and more volatile cash flows and lower net working capital. These are all characteristics that either increase the cost of cash shortfalls or increase the cost of raising funds. Both transactions costs and costs due to asymmetric information are important factors in this tradeoff model. However, there is little evidence in their data to suggest that agency costs of managerial discretion matter because managers who are more likely to be entrenched do not hold more cash. Consistent with this finding, Mikkelson and Partch (2003) find no differences between the ownership structures of firms that consistently hold large cash reserves and those with normal cash levels. This contrasts with Harford's (1999) work, which focuses on the impact of cash holdings on the acquisitions made by companies. He finds that cash rich firms are more likely to attempt acquisitions. In addition, these cash rich bidders are also more likely to overpay in acquisitions, and their post-acquisition operating performance is worse than for other acquirers, which suggests that agency costs matter when managers decide to use the built-up cash.[1]

One possible reason why the current evidence in support of the agency cost motive for cash holdings is weak is that the literature focuses on the U.S. and shareholders in the U.S. enjoy good protection. Thus, shareholders in the U.S. can force managers to return excess funds to them (see La Porta, Lopez-de-Silanes, Shleifer, and Vishny (LLSV) (2000) for supporting evidence). The primary motivation for this paper is to shed additional light on the role of corporate governance in the determination of corporate cash holdings through the use of international data. To do this, we employ data for approximately 11,000 companies from 45

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[1]Lang, Stulz, and Walkling (1991) also provide some support for this hypothesis. They find that firms with high cash flows and low q ratios are more likely to overpay in acquisitions; of course, they look at cash flow, rather than the level of cash, so their evidence is merely indirect. Blanchard, Lopez-de-Silanes, and Shleifer (1994) also have evidence that large cash holdings affect firm behavior. They look at 11 firms that received cash windfalls over the period 1980–1986 without affecting their investment opportunity set. Generally, they find that these firms do not return the funds to equityholders or debtholders, but use it for endeavors that are not value creating, on average. In a recent paper, Almeida, Campello, and Weisbach (2002) provide indirect evidence on the importance of agency costs for the cash holdings of U.S. firms. They find that managers with low ownership build up cash when cash flows are plentiful, even when their firms do not appear to be financially constrained.

countries. The main reason for taking the arguments to international data is that the variation in agency costs of equity across countries is likely to be at least as substantial as the variation across companies within a particular country. In addition, differences across countries in capital market development allow us to construct several tests of the importance of agency problems, which cannot be developed on data from one country. We focus our analysis on 1998, which is the most recent year for which comprehensive data were available on the Global Vantage database.

Our results provide strong support for the importance of corporate governance in determining corporate cash levels. After controlling for industry effects, firms in countries with the lowest level of shareholder protection hold almost 25% more cash than firms in countries with the highest level of shareholder protection. This difference increases to 70% when we control for capital market development. Interestingly, after controlling for shareholder rights, firms hold more cash when debt markets are more developed, which is consistent with the agency cost hypothesis: firms raise and hold more cash when they have the ability to do so.

When we also include the other firm characteristics that are expected to affect cash levels, the effect of shareholder protection strengthens further. Firms in countries with the lowest level of shareholder protection hold more than twice the amount of cash than firms in countries with the highest level of shareholder protection. The sign and significance of the other variables is consistent with prior evidence. In particular, we find that firms hold more cash when they have higher market-to-book ratios and higher R&D expenditures, which provides further support for the tradeoff theory. In addition, larger firms hold less cash while more profitable firms hold more cash. Finally, firms with higher net working capital, which can easily be converted to cash, also hold less cash. Thus, working capital and cash appear to be substitutes. We also verify that our results persist after controlling for dividend payments to ensure that our findings are not merely the flip side of LLSV (2000) who report that dividends are higher in countries with good shareholder protection.

Two other tests confirm that corporate governance is significantly correlated with cash holdings, and that this is caused by increased managerial discretion and is, therefore, likely to be detrimental to shareholders. First, we examine whether the sensitivity of corporate cash holdings to investment opportunities depends on shareholder rights. This allows us to consider (and reject) a more nuanced interpretation of the relation between governance and cash holdings. One interpretation of our findings is that managers hold more cash because shareholders cannot force them to disgorge the funds. This allows managers to make more decisions ignoring the interests of shareholders. There is an alternative interpretation of this result, however. In countries with low shareholder protection, it may be more costly to raise external funds. Managers are therefore more inclined to hoard cash in case good opportunities come along. This interpretation of the result is much more benign. However, if this is the case, we would expect firms with good investment opportunities to hold more cash in countries with low shareholder protection, because the inability to raise financing is more costly for these firms. On the other hand, if the cash holdings are an outcome of the agency conflict, we would expect managers to pay less attention to investment opportunities

when shareholders have little protection since this transactions cost motive is not the primary determinant of cash holdings. This interpretation implies that the relationship between investment opportunities and cash is strongest in countries with fewer agency problems. Consistent with the latter interpretation, we find that the effect of the market-to-book ratio is much weaker in countries with few shareholder rights.

The second test is related to the work of Rajan and Zingales (1998) on financial dependence and growth. They show that manufacturing firms from industrial sectors that need more outside financing grow more in countries with more developed capital markets. We employ their measure of outside financing in our analysis of the determinants of cash holdings to further distinguish between the transaction cost and agency cost explanations of our findings. We find that firms in industries with more dependence on external finance have more cash. Interestingly, this effect weakens significantly in countries with poor shareholder protection. This lack of concern for external financing needs is further evidence of the agency motive for cash holdings. If firms simply hold cash because it is costlier to raise outside financing when shareholder protection is weak, we would have expected the importance of financing needs to become stronger, not weaker.

Overall, the evidence in this paper indicates that shareholder rights, and therefore agency costs, are important in determining corporate cash holdings throughout the world. There is little other systematic evidence on the determinants of corporate cash holdings outside the U.S. Rajan and Zingales (1995) present some descriptive statistics of cash holdings in the G-7 countries for 1991. What stands out in their data is that Japanese firms had almost twice as much cash and equivalents in 1991 as the companies in the other countries. Pinkowitz and Williamson (2001) focus on the large cash holdings in Japan. They argue that these holdings derive from the power exerted by the strong Japanese banks and they find that corporate cash holdings decline as bank power weakened over time. Love (2000) concentrates on the relation between a country's financial development and the investment cash flow sensitivity of its firms. Part of her research also analyzes the determinants of cash holdings internationally, but a shareholder rights variable is not included in her analysis. She does find that firms hold more cash in countries with a lower level of financial market development.

The remainder of this paper is organized as follows. Section II discusses the various determinants of corporate cash holdings in greater detail. Section III describes our data collection procedure. Section IV contains our results, and Section V concludes.

II.   Corporate Cash Holdings and Corporate Governance

Opler et al. (1999) develop a useful framework for thinking about the determinants of cash holdings by firms. As mentioned previously, they discuss two views of cash holdings: the tradeoff model, which hypothesizes that firms trade off various costs and benefits of debt financing when they decide how much cash to keep and the financing hierarchy model, which suggests that cash balances are the outcome of firm profitability and financing needs. We now discuss both views

in more detail and the variables that can be employed as proxies to test these views.

A.   The Tradeoff Model of Corporate Cash Holdings

We can identify two costs of holding cash and cash equivalents. If we assume that managers maximize shareholder wealth, the only cost of holding cash is the lower return earned on it, relative to other investments of the same risk. This cost is often called the cost-of-carry: the difference between the return on cash and the interest that would have to be paid to finance an additional dollar of cash. If we relax the assumption of shareholder wealth maximization, the costs of holding cash increase since managers now have the opportunity to engage in wasteful capital spending and acquisitions or, in some countries, outright theft.

The benefits of holding cash balances stem from two motives. According to the transaction costs motive, firms hold more cash when the costs of raising it and the opportunity costs of shortfalls are higher. The current literature employs several variables to proxy for these costs. Given the substantial fixed costs involved in raising outside financing, small firms are likely to find it costlier to raise outside funds. In addition, there may be economies of scale in cash management, which also suggest that small firms hold more cash. Firms with better investment opportunities are expected to hold more cash because the opportunity cost of lost investment is larger for these companies; similarly, we expect firms with more volatile cash flows to hold more cash to protect against the higher likelihood of cash shortfalls. The level of capital spending, itself, should also be positively related with cash levels if it captures investment demands. In contrast, when cash flows are higher, firms need to hold less cash to meet future investment needs. Finally, firms that pay dividends can always cut them to raise more funds, and they are therefore expected to hold less cash. Kim, Mauer, and Sherman (1998) develop a tradeoff model of optimal cash holdings. Many of the predictions that follow from their model are similar to those highlighted above. They also argue that optimal cash holdings are decreasing in the rate of return on current investment opportunities.

The precautionary motive for holding cash is based on the impact of asymmetric information on the ability to raise funds. In particular, even when firms have access to capital markets to raise financing, they may not want to do so at a particular point in time because the securities they are planning to issue are undervalued. Myers and Majluf (1984) argue that firms can overcome this problem by building up financial slack, which they define as cash, cash equivalents, and unused risk-free borrowing capacity. Since firms with high R&D expenses are more opaque, the level of R&D to sales is a reasonable proxy for asymmetric information. We already employ the market-to-book ratio of the firm because it captures growth opportunities, which are important in the transactions cost motive. Of course, there is generally more uncertainty about the value of growth opportunities than about assets in place. As such, the market-to-book ratio can also be employed as a proxy for asymmetric information.

In a recent paper, Almeida, Campello, and Weisbach (2002) focus on the importance of financial constraints in determining the optimal cash level. Finan-

cially constrained firms cannot raise sufficient funds to finance all future expected investment needs and may decide to hoard cash today to fund future investment. For unconstrained firms, cash holdings are irrelevant. Because of this irrelevance, Almeida et al. (2002) focus on the sensitivity of annual changes in cash holdings to cash flows and not on cash levels. Consistent with their model, they find that this sensitivity is only positive for constrained firms. The irrelevance proposition of Almeida et al. (2002) suggests that including unconstrained firms in an analysis of cash levels may make the estimation noisier. As mentioned previously, they also find that unconstrained firms with low managerial ownership build up cash when cash flows are high, which is consistent with the agency motive, but not the precautionary motive.

B.   The Financing Hierarchy View of Corporate Cash Holdings

The financing hierarchy view suggests that there is no optimal level of cash, just as there is no optimal level of debt. Cash balances are simply the outcome of the investment and financing decisions made by the firm as suggested by the pecking order theory of financing. Firms with high cash flows pay dividends, pay off their debts, and accumulate cash. Firms with low cash flows draw down their cash and issue debt to finance investment, but they refrain from issuing equity because it is too costly. Unfortunately, many of the variables that are correlated with cash flows can also be employed as proxies in the tradeoff theory. The major difference between the two views is that the tradeoff theory predicts a positive relationship between investment (in capital expenditures and R&D) and cash levels, while the hierarchy view predicts a negative sign. Additionally, the hierarchy view sees debt and cash merely as opposite sides of the same coin.

C.   Shareholder Protection and Cash Holdings

As discussed in Section II.A, the agency cost view of corporate cash holdings suggests that managers who are less concerned with shareholder wealth hoard cash and invest it in negative NPV projects or use it to overpay in acquisitions. Of course, simply holding too much cash destroys value because of the cost of carry. In addition, if these cash holdings reduce the discipline imposed on management, corporate decision making may be affected, resulting in reduced firm earnings. One of the issues in the well-known 1995 Chrysler case was not that holding onto cash was wasteful per se or that management would spend it on negative NPV projects, but that management would not take much action in case the U.S. economy went into a recession. Management had basically informed shareholders that the $7.5 billion cash hoard would be needed (i.e., used up) to weather a recession. Consistent with this view, Opler et al. (1999) show that firms that move from high to low cash holdings are loss-making firms.

Overall, however, there is little support for the agency cost motive because ownership structure and cash levels are not strongly related. An alternative interpretation of this evidence is that in the U.S. shareholders enjoy good legal protection and can therefore force companies to disgorge the cash. LLSV (2000) report evidence on dividend policy consistent with this interpretation. They find

that firms pay out more of their earnings in the form of dividends in countries with good legal protection for shareholders. We therefore take the question to international data and see whether cash holdings are higher in countries where shareholders have fewer rights. In addition, we study whether the variables that measure the transactions costs and precautionary motives for holding cash are less important when shareholder rights are weak. This is a corollary to the earlier tests: if cash holdings are partly the outcome of weak shareholder protection, the other determinants should be less important. An alternative explanation for high cash holdings in countries with weak shareholder protection is that firms simply hold more cash because capital markets are not receptive to new financing. This would make the precautionary and transactions costs motives for cash holdings more important. We examine this possibility in three ways. First, we determine whether the development of the equity and debt markets affects cash holdings or whether these effects are dominated by shareholder protection. Second, we determine whether the importance of proxies for the precautionary and transactions costs motives is larger in countries with more shareholder protection. Third, we analyze whether firms with greater need for outside financing hold more cash and whether these holdings are affected by the level of shareholder protection.

There is also another interpretation of the relation between shareholder rights and cash holdings. We know from the work by LLSV that ownership is more concentrated in countries with few shareholder rights. It is possible that controlling families force firms to hold more cash as a store of wealth because the taxes that need to be paid when taking the funds out are higher. To study the merits of this interpretation, we include dummies for family control and dividend taxation in some specifications.

III.   Data Collection and Variable Construction

We gather data from the Global Vantage database for 1998. The database contains financial information for 16,157 companies from 80 countries. To measure shareholders rights, we employ the shareholder rights measure developed by LLSV (1998). This is an index formed by adding one when each of six criteria relating to the extent to which minority shareholders have a say in corporate governance is met. LLSV construct this measure for 49 countries; firms from other countries are excluded from our analysis. These excluded countries are mainly current and former Communist countries and African countries. In addition, four countries for which LLSV have shareholder rights data are not included in Global Vantage: Ecuador, Nigeria, Sri Lanka, and Uruguay. Thus, corporations from 45 countries are included in this article.

We further remove the following sets of firms from the sample: i) firms with operations in financial services (SIC codes starting with 6); ii) firms that are considered governmental or quasi governmental (SIC codes starting with 9); iii) firms for which cash and equivalents and/or assets are missing; and iv) firms that do not present consolidated financial statements.[2] The remaining sample consists of 11,591 companies from 45 countries.

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[2]The majority of the firms in each country report consolidated financial statements, except for India and South Korea. To see whether our results are affected when we eliminate countries in which

We define the cash ratio as the ratio of cash and cash equivalents to net assets, where net assets are computed as assets less cash and equivalents. The main reason for netting out cash from assets is that a firm's profitability is mainly related to assets in place and cash should be measured relative to this base. We also report robustness checks where we use the ratio of cash to sales.

Table 1 presents a first look at the data. In this table, we divide the countries into two groups based on LLSV's shareholder rights variable. Twenty-nine countries are in the high shareholder rights group (shareholder rights variable equal to three, four, or five) and 16 are in the low shareholder rights group (shareholder rights variable equal to zero, one, or two). The U.S., Japan, and the U.K. are the countries with the largest representation in the sample. There is substantial variation in firm size as measured by book value of assets. The median firm in Mexico has a book value of $1.16 billion, while the median firm in Pakistan has a book value of only $72 million.

Our key ratio, cash to net assets, is displayed in the third column of Table 1. There is tremendous cross-country variation in this ratio. The overall median is 6.6%, but many countries have median cash to net assets of over 10%. Egypt with cash to net assets of 29.57% and Israel with cash to net assets of 20.93% stand out. Japanese firms have a median cash to net assets ratio of 15.49%, which is the highest of the countries with developed capital markets. In fact, this ratio is twice as high as for the U.K. and more than double the level of the U.S. and Germany. Our figures for Germany, Japan, and the U.S. broadly correspond to those reported by Pinkowitz and Williamson (2001).

Firms in the high shareholder rights group have median cash to net assets of 6.30%, compared to 8.60% in countries with low shareholder rights, consistent with the view that firms hold more cash when shareholder protection is weak.[3] For example, the median U.S. firm is close in size to the median Swiss firm, but median U.S. cash holdings are only $19.5 million vs. $31.7 million in Switzerland (median cash holdings are not reported in the table).

Table 1 also reports country medians for some of the other variables employed in our analysis. We do not have the same number of observations for these variables because they are not available on Global Vantage or because they require data to be available for prior years. In addition to size, investment opportunities are important for both the transaction costs and the precautionary motive. The market-to-book ratio of the firm, computed as (market value equity + book value liabilities) / total assets is employed as a proxy for investment opportunities.[4] Note that the U.S. has the highest median market-to-book ratio of the countries

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many firms choose not to consolidate their financial statements, we apply the following procedure: we remove countries when more than x% of the firms do not consolidate, where x varies between 90% and 10%. We then re-estimate all regressions for each subset of countries. Our findings persist for all cutoffs.

  [3]Brazil, Chile, Colombia, and Greece require their companies to pay out a certain fraction of income as dividends, which may lower these firms' cash balances; all our results continue to hold when we control for this minimum payout level. As expected, firms from countries with minimum payouts have lower cash balances.

  [4]We have repeated all our tests using a modified market-to-book ratio where we subtract cash and cash equivalents from both the numerator and the denominator of the ratio. Our results are virtually unchanged. The correlation between the original and modified market-to-book ratio is 0.83 at the firm level.

with developed capital markets at 1.51. We also report median book leverage, the ratio of net working capital to net assets, the ratio of cash flow to net assets, and the level of capital expenditures to net assets. Cash flow is defined as EBITDA – interest payments – taxes – dividends. Unlike for the U.S., capital expenditures data are not consistently available for most countries. We therefore proxy for capital spending by taking the difference in net fixed assets compared to the previous year and adding depreciation. The other variables included in the main analysis but not reported in the table are: i) a dummy variable, equal to one if the firm

pays a dividend and zero otherwise; and ii) the ratio of R&D expenses to sales as a measure of opaqueness.

We include leverage in some specifications to see whether firms simply finance additional cash holdings with more debt. The ratio of net working capital to net assets is included as a control variable. Net working capital is normally computed as current assets minus current liabilities, but we remove cash from the current assets computation. This ratio captures additional liquid assets held by the firm and our goal is to determine whether this additional source of liquidity acts as a complement or substitute for cash and equivalents. All of the ratios included in the analysis show substantial variability across countries.

IV. Results

This section contains the findings of our investigation of the determinants of cash holdings across the countries in our sample. In subsection A, we present our main results. Subsection B contains a number of additional tests, including an analysis at the country level and subsection C explores the relation between cash holdings and interactions between shareholder rights and firm characteristics.

A. Explaining Firm Cash Holdings

Table 2 contains the analysis of firm-level cash levels. We employ the log of the ratio of cash to net assets as the dependent variable (as do Opler et al. (1999)). All variables are winsorized at their 1st and 99th percentiles to avoid problems with outliers. Significance levels are adjusted to reflect White's heteroskedasticity correction of the standard errors.

Model (i) of Table 2 contains a regression model with only the level of the shareholder rights variable and industry dummies, defined at the two-digit SIC code level, as explanatory variables. Consistent with the agency motive for cash holdings, the coefficient on shareholder rights is negative and highly significant. The economic significance of the result is also substantial. Increasing shareholder rights from zero to five leads to a decrease in cash holdings of 18%.

As LLSV (1998) demonstrate, shareholder rights are correlated with the legal origin of a country, where the main distinction is between countries with a common law tradition vs. those with a civil law tradition. We investigate in column (ii) whether our results also hold when we include a common law dummy in the regression instead of the shareholder rights level. The coefficient on the common law dummy is indeed negative and significant. The coefficient of −0.44

TABLE 1

Summary Statistics

Country	No. of Firms	Cash & Equivalents/ Net Assets	Firm Size	Market-to-Book	Book Leverage	Net Work. Cap./Net Assets	Cash Flow/ Net Assets	ICAPX/ Net Assets
High Shareholder Rights								
Argentina	24	1.7%	828	0.99	35.8%	0.4%	7.2%	7.0%
Australia	324	5.7%	130	1.19	19.8%	−0.3%	2.5%	6.0%
Brazil	131	7.3%	594	NA	28.6%	−7.7%	1.5%	6.2%
Canada	471	4.5%	220	1.20	26.0%	3.4%	6.2%	9.5%
Chile	87	3.1%	261	0.92	22.9%	2.1%	6.6%	8.6%
Colombia	13	1.5%	416	0.66	13.7%	−0.2%	1.0%	13.0%
Finland	95	7.6%	268	1.11	21.9%	8.2%	8.3%	6.8%
France	535	11.1%	116	1.22	19.9%	7.3%	9.0%	5.9%
Hong Kong	133	13.1%	192	0.82	18.9%	−3.7%	−0.7%	0.7%
India	8	3.4%	107	1.16	19.3%	11.3%	6.3%	5.2%
Ireland	59	7.9%	133	1.45	21.8%	−3.4%	6.0%	8.2%
Israel	37	20.9%	214	1.17	18.3%	3.1%	6.2%	7.2%
Japan	1853	15.5%	476	1.02	29.8%	−3.5%	4.0%	3.4%
Kenya	1	0.3%	45	1.13	12.0%	−2.6%	5.3%	9.6%
Malaysia	379	6.3%	101	0.99	26.7%	−1.9%	2.2%	3.3%
New Zealand	67	1.7%	117	1.07	28.8%	−0.2%	6.6%	10.0%
Norway	127	12.7%	140	1.04	24.0%	0.1%	4.3%	5.3%
Pakistan	30	5.3%	72	0.89	37.2%	−2.3%	7.3%	5.8%
Peru	15	3.1%	224	0.57	21.2%	3.9%	9.2%	10.8%
Philippines	75	4.9%	146	0.81	27.1%	−2.6%	1.9%	7.2%
Portugal	43	3.6%	286	1.12	24.2%	−3.0%	7.5%	10.6%
Singapore	247	10.2%	116	0.93	24.2%	−3.0%	3.8%	3.8%
South Africa	98	8.6%	494	1.21	10.2%	4.7%	7.4%	9.7%
Spain	110	5.3%	388	1.46	17.0%	0.8%	8.0%	6.7%
Sweden	222	9.4%	109	1.21	19.1%	12.9%	7.2%	7.6%
Taiwan	95	11.6%	656	1.43	29.3%	−1.9%	3.3%	8.2%
U.K.	1164	8.1%	117	1.39	18.9%	0.4%	6.5%	6.8%
U.S.	3429	6.4%	319	1.51	23.6%	5.9%	7.2%	8.3%
Zimbabwe	5	2.9%	134	0.93	21.0%	−5.4%	7.4%	13.3%
Median	95	6.3%	192	1.11	21.9%	−0.2%	6.3%	7.2%
Low Shareholder Rights								
Austria	73	8.4%	217	1.12	26.3%	7.0%	6.9%	8.1%
Belgium	81	10.3%	215	1.42	25.0%	2.2%	9.0%	5.8%
Denmark	118	12.7%	160	1.07	23.4%	8.1%	7.3%	7.4%
Egypt	6	29.6%	284	2.11	17.5%	−12.9%	0.1%	19.8%
Germany	449	7.3%	212	1.25	16.8%	16.1%	8.2%	7.0%
Greece	55	5.0%	153	1.94	22.1%	15.3%	8.8%	8.3%
Indonesia	112	10.3%	206	1.03	64.0%	−20.0%	5.4%	8.8%
Italy	151	6.8%	444	1.14	21.2%	6.4%	6.7%	4.6%
Jordan	1	2.6%	256	1.51	27.6%	1.7%	11.8%	NA
Mexico	77	5.6%	1164	0.85	29.6%	1.7%	6.9%	16.4%
Netherlands	186	5.0%	217	1.43	18.5%	10.1%	9.4%	7.1%
South Korea	8	8.9%	746	0.95	36.6%	−8.6%	3.2%	19.1%
Switzerland	166	11.4%	311	1.17	24.4%	8.5%	8.1%	4.7%
Thailand	189	3.8%	94	0.92	46.0%	−11.5%	1.6%	3.1%
Turkey	34	13.4%	173	1.32	18.5%	3.8%	4.7%	23.2%
Venezuela	9	6.6%	523	0.47	17.1%	2.4%	5.3%	9.8%
Median	79	8.6%	217	1.15	23.9%	3.1%	6.9%	8.1%
Overall Median	95	6.6%	214	1.12	22.1%	0.8%	6.6%	7.3%

All numbers except for No. of Firms are country medians. Net Assets are total assets minus cash and equivalents. Firm Size is the book value of total assets in $U.S. (millions). Market-to-Book is the market value of equity plus the book value of liabilities divided by the book value of total assets. Book Leverage is short-term plus long-term debt divided by the book value of total assets. Net Work. Cap. is current assets minus current liabilities minus cash and equivalents. Cash Flow is operating income plus depreciation and amortization minus interest minus taxes minus dividends. ICAPX is the year-on-year change in net fixed assets plus depreciation.

indicates that firms in common law countries hold 35% less cash than those in civil law countries.

Our interpretation of the result in column (i) is that managers like to hold a lot of cash because it reduces pressures to perform and allows them to spend these funds on projects that increase their non-pecuniary benefits, but have a negative impact on shareholder wealth. There is an alternative interpretation for this result,

TABLE 2

Pooled Cross-Country Regression

Variable	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Shareholder Rights (level)	−0.04 (0.00)		−0.11 (0.00)	−0.10 (0.00)		−0.18 (0.00)
Common Law		−0.44 (0.00)			−0.61 (0.00)	
External Capital/GNP			−0.00 (0.98)			0.11 (0.06)
Private Credit/GDP			0.45 (0.00)			0.45 (0.00)
Market-to-Book				0.13 (0.00)	0.14 (0.00)	0.13 (0.00)
Size				−0.04 (0.00)	−0.06 (0.00)	−0.06 (0.00)
NWC/Net Assets				−0.80 (0.00)	−0.75 (0.00)	−0.74 (0.00)
Cash Flow/Net Assets				0.22 (0.01)	0.22 (0.01)	0.24 (0.00)
R&D/Sales				1.30 (0.00)	1.35 (0.00)	1.33 (0.00)
Constant	0.04 (0.38)	0.32 (0.00)	−0.14 (0.02)	−0.59 (0.03)	−0.48 (0.35)	−0.91 (0.00)
Adj. R^2	0.12	0.14	0.14	0.18	0.20	0.20
N	11413	11414	11411	8447	8447	8445

The dependent variable is the log of cash and equivalents divided by net assets. Net Assets are total assets minus cash and equivalents. The Shareholder Rights variable goes from zero to five. The Common Law variable is a dummy equal to one for common law countries, and zero otherwise. External Capital is the stock market capitalization held by minority shareholders. Private Credit is the credit provided by deposit money banks and other financial institutions to non-government owned firms. Market-to-Book is the market value of equity plus the book value of liabilities divided by the book value of total assets. Size is the log of the book value of total assets in $U.S. NWC is current assets minus current liabilities minus cash and equivalents. Cash Flow is operating income plus depreciation and amortization minus interest minus taxes minus dividends. All regressions include industry dummy variables, defined at the two-digit SIC code level. The numbers in parentheses are p-values based on robust standard errors.

however, which is much more benign. We know from LLSV (1997) that capital markets are not well developed in countries with poor shareholder protection. This implies that the transactions costs of raising additional funds are higher, and firms may respond to this by holding higher cash balances.

In regression (iii) of Table 2, we include two measures of capital market development to investigate whether this alternative interpretation is more consistent with the data. The first measure is the ratio of the external capital market to GNP and is discussed in greater detail in LLSV (1997). This ratio employs the stock market capitalization held by minority shareholders as the numerator. This may be a better measure of the size of capital markets than stock market capitalization in countries where shareholdings are highly concentrated. The second measure captures the size of the credit market. It is the ratio of "private credit by deposit money banks and other financial institutions" to GDP. This measures the total amount of debt finance to private firms from all financial institutions, except central banks. We obtain this ratio from Levine, Loayza, and Beck (2000). After controlling for the development of the capital market, we continue to find that shareholder rights are important. In fact, the coefficient on shareholder rights more than doubles relative to model (i). In addition, the sign on the size of the debt market is positive and highly significant. This result suggests that, if anything, firms hold more cash when capital markets are large, and does not support

the view that cash holdings are driven by the inability of corporations to raise funds. Instead, the easier it is to raise funds, the more cash companies hold, which is supportive of the agency view. Of course, this interpretation of the regression is only partially supported, given the lack of significance of the coefficient on equity market development.

Models (iv) through (vi) of Table 2 repeat the previous analyses, but they include firm-specific characteristics in addition to the industry dummies to make sure that shareholder rights are not simply proxying for differences in firms across countries. If anything, the results are stronger after controlling for firm-specific characteristics. The coefficient on shareholder rights increases from -0.04 in model (i) to -0.10 in model (iv) and from -0.11 in model (iii) to -0.18 in model (vi). Based on model (vi), moving from zero to five in the shareholder rights category reduces the level of cash and cash equivalents by 61%. Also note that many of the control variables are significant and have the expected sign. Thus, controlling for industry alone is not sufficient to capture the dispersion in the cash ratios. Consistent with prior evidence, we find that firms with higher market-to-book ratios and higher levels of R&D expenses relative to sales have higher cash holdings, which supports both the transactions costs and precautionary motives. We also find an important size effect: larger firms hold less cash. There is also a positive relation between cash holdings and cash flows, which is consistent with both the tradeoff and financing hierarchy models. Finally, the negative coefficient on the ratio of net working capital to net assets suggests that cash holdings and net working capital are substitutes. The other determinants of cash holdings are also important economically. For instance, increasing firm size from its 25th percentile ($92 million) to its 75th percentile ($985 million) reduces cash holdings by 13%, based on model (vi); increasing the market-to-book ratio from its 25th percentile (0.96) to its 75th percentile (1.75), leads to an increase in cash holdings of 11%.

The model estimated in Table 2 is called the reduced form model, because we do not include dividends, capital structure, or capital expenditures as explanatory variables. These variables are excluded because the tradeoff theory would argue that leverage, cash holdings, and investment policy are jointly determined. However, in robustness checks we verify that this omission does not drive our results. In addition, we do not include industry cash flow volatility in our models because the industry dummies capture this effect. Finally, we do not include a regulation dummy because regulation varies dramatically across countries.[5]

B.   Additional Tests

In this subsection, we perform a variety of tests to investigate whether our findings are robust. In particular, we focus on four sets of issues: i) the lack of

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[5]We have also estimated models using a firm's excess cash level relative to two "optimal cash" level benchmarks as the dependent variable. Both make use of U.S. data to determine what the base-case level of cash holdings should be, assuming that a benchmark based on U.S. data provides a good indication of what cash levels should be when shareholder rights are strong (see also Pinkowitz and Williamson (2001) who use a similar approach). The first benchmark is the median cash level in the same U.S. two-digit SIC code industry. To compute the second benchmark we estimate the reduced form cash regression model for U.S. firms and use the estimated coefficients to predict cash levels for the other firms in our sample. All results using *excess* cash levels are consistent with those using *raw* cash levels reported in the paper.

independence of observations within a country and within an industry; ii) construction of the variables: iii) omitted variables; and iv) robustness over time and across subsamples.

The regression models reported in Table 2 are estimated using OLS, which assumes independence of the observations. It is possible that there are interdependencies of observations within an industry and within a country. To make sure that our findings persist after controlling for these interdependencies, we estimate a random effects model with random effects for each country/industry pair. This allows for different industry effects per country, as well as for country effects. In fact, a Breusch-Pagan test rejects the null hypothesis that the error terms are independent across countries and industries. The results of this analysis are reported in Table 3, using the same structure as in Table 2. The coefficient on shareholder rights remains highly significant in all models. It is somewhat smaller in absolute magnitude in the models that include firm characteristics, but it remains economically important. For example, based on regression (vi) of Table 3, moving from countries with high shareholder rights to countries with low shareholder rights increases cash holdings by more than 80%, after controlling for industry and firm characteristics. The coefficients on the other explanatory variables are also similar in magnitude and significance to those reported in Table 2.

TABLE 3

Pooled Cross-Country Regression with Country and Industry Random Effects

Variable	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Shareholder Rights (level)	−0.04 (0.02)		−0.09 (0.00)	−0.06 (0.00)		−0.12 (0.00)
Common Law		−0.36 (0.00)			−0.43 (0.00)	
External Capital/GNP			0.04 (0.61)			0.09 (0.26)
Private Credit/GDP			0.35 (0.00)			0.37 (0.00)
Market-to-Book				0.17 (0.00)	0.17 (0.00)	0.17 (0.00)
Size				−0.07 (0.00)	−0.07 (0.00)	−0.07 (0.00)
NWC/Net Assets				−0.47 (0.00)	−0.49 (0.00)	−0.47 (0.00)
Cash Flow/Net Assets				0.21 (0.00)	0.20 (0.00)	0.22 (0.00)
R&D/Sales				1.35 (0.00)	1.34 (0.00)	1.35 (0.00)
Constant	−2.54 (0.00)	−2.52 (0.00)	−2.77 (0.00)	−2.43 (0.00)	−2.41 (0.00)	−2.65 (0.00)
R^2	0.01	0.01	0.02	0.12	0.14	0.14
N	11413	11414	11411	8447	8447	8445

The dependent variable is the log of cash and equivalents divided by net assets. Net Assets are total assets minus cash and equivalents. The Shareholder Rights variable goes from zero to five. The Common Law variable is a dummy equal to one for common law countries, and zero otherwise. External Capital is the stock market capitalization held by minority shareholders. Private Credit is the credit provided by deposit money banks and other financial institutions to non-government owned firms. Market-to-Book is the market value of equity plus the book value of liabilities divided by the book value of total assets. Size is the log of the book value of total assets in $U.S. NWC is current assets minus current liabilities minus cash and equivalents. Cash Flow is operating income plus depreciation and amortization minus interest minus taxes minus dividends. Industry is defined at the two-digit SIC code level. The numbers in parentheses are p-values.

An alternative way of dealing with the lack of independence of observations is to estimate regressions on countries' means. These findings are reported in Table 4.[6] Regression (i) is the basic regression model estimated previously at the firm level, but we now have only one observation per country, namely the country average. The coefficient on the shareholder rights variable is significant and similar in magnitude to that estimated at the firm level. However, these models have no industry controls. This problem is remedied in model (ii) where we first adjust all firm-level variables by their two-digit SIC code industry average, prior to the computation of the country mean. Again, we find that the shareholder rights variable is significantly negative.

TABLE 4
Regression of Country Means

Variable	Raw Data (I)	Industry-Adjusted (II)
Shareholder Rights (level)	−0.15 (0.08)	−0.12 (0.09)
External Capital/GNP	0.18 (0.63)	0.04 (0.89)
Private Credit/GDP	0.33 (0.22)	0.27 (0.19)
Market-to-Book	0.43 (0.10)	0.40 (0.53)
Size	−0.07 (0.62)	0.02 (0.87)
NWC/Net Assets	−1.27 (0.18)	−1.70 (0.10)
Cash Flow/Net Assets	−0.21 (0.93)	0.24 (0.91)
R&D/Sales	3.01 (0.44)	−0.45 (0.88)
Constant	−2.90 (0.05)	−0.06 (0.81)
Adj. R^2	0.18	0.05
N	42	42

All variables are country means. The regression model in column (I) is based on raw data and the regression model in column (II) is based on industry-adjusted data, where industry is defined at the two-digit SIC code level. The dependent variable is the log of cash and equivalents divided by net assets. Net Assets are total assets minus cash and equivalents. The Shareholder Rights (level) variable goes from zero to five. External Capital is the stock market capitalization held by minority shareholders. Private Credit is the credit provided by deposit money banks and other financial institutions to non-government-owned firms. Market-to-Book is the market value of equity plus the book value of liabilities divided by the book value of total assets. Size is the log of the book value of total assets in $U.S. NWC is current assets minus current liabilities minus cash and equivalents. Cash Flow is operating income plus depreciation and amortization minus interest expenses minus taxes minus dividends. The numbers in parentheses are p-values based on robust standard errors.

The next set of robustness tests, reported in panel A of Table 5, focuses on the construction of both the dependent and explanatory variables. In model (i), we divide countries into two groups based on shareholder rights, where countries with high shareholder rights have a shareholder rights index of three and higher. This shareholder rights dummy is employed as the explanatory variable instead of the rights level. We continue to find that firms in countries with better shareholder protection hold more cash. In model (ii), we employ the ratio of cash to sales as the dependent variable instead of cash to net assets. While we use net

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[6]Green (1993) argues that estimating OLS at the group means level could lead to heteroskedasticity; we therefore report p-values based on White-adjusted standard errors.

assets to deflate cash levels to maintain consistency with other studies, there are substantial cross-country differences in accounting conservatism, which may affect book assets (see, for example, Flower and Ebbers (2002)). Sales figures are less likely to be affected by conservatism than assets, which justifies employing a sales deflator. The coefficient on shareholder rights remains negative and significant in this specification, and it is actually larger than in the base case where cash holdings are divided by net assets. In column (iii), panel A of Table 5, we use the shareholder rights dummy while scaling cash by sales. If anything, the shareholder rights variable becomes more important in explaining cash levels. In column (iv), we use sales to deflate the level of cash as well as all the independent variables, with similar results.

We are also worried that the market-to-book ratio is not a good proxy for investment opportunities for two reasons. First, the market-to-book ratio captures both the value of investment opportunities together with the probability that the firm will take them, and this probability may vary across countries. Second, the market-to-book ratio is also affected by differences in the measurement of book assets across countries. We therefore use past sales growth as a measure of investment opportunities, in line with LLSV (2000). Sales growth is averaged over the prior five years or however many years of data are available on Global Vantage. Model (v) contains the results of this model: past sales growth is positively related to cash holdings, but this does not affect the importance of the shareholder rights variable.

Overall, the results in panel A of Table 5 indicate that the impact of shareholder rights on cash holdings does not depend on how shareholder rights are measured or what deflator is employed in the construction of the variables. The coefficients on the other explanatory variables are generally stable across the different regression models.

In panel B of Table 5, we investigate whether our findings persist after controlling for a number of other potential determinants of corporate cash holdings. In model (i), we include the variables excluded from the reduced form model: leverage, a dividend dummy, and the level of capital expenditures, albeit that these variables are likely to be endogenous. Even after controlling for these effects, we continue to find that firms hold lower cash balances in countries where shareholders are not as well protected.[7] The inclusion of capital expenditures also mitigates another concern: it is possible that the explanatory variables are measured with different errors across countries; this could be particularly troubling for R&D, because in some countries certain development expenditures need to be capitalized, while they are expensed in other countries (see Flower and Ebbers (2002)). Capitalized R&D expenses are accounted for as capital expenditures, which implies that our measure of opaqueness (R&D over sales) is biased. This bias may be correlated with shareholder rights because it is in countries with low

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[7] We also examine whether firms are indifferent between having one more dollar of cash or one less dollar of debt. The specification estimated in Table 2 employs the log of the cash ratio as the dependent variable, but the level of the leverage ratio as one of the explanatory variables, and is therefore not suited to examine this question. Using levels on both sides, we find the coefficient on leverage is always significantly larger than -1. Thus, the decision between holding cash and paying off debt is not a matter of indifference.

TABLE 5
Robustness Tests of Pooled Cross-Country Regression

The dependent variable in models (ii), (iii), and (iv) of panel A is the logarithm of cash and equivalents divided by sales. The dependent variable in all other models is the logarithm of cash and equivalents divided by net assets. Net Assets are total assets minus cash and equivalents. The Shareholder Rights (level) variable goes from zero to five. The Shareholder Rights (dummy) variable is a dummy variable equal to one if shareholder rights are high, and zero otherwise. External Capital is the stock market capitalization held by minority shareholders. Private Credit is the credit provided by deposit money banks and other financial institutions to non-government owned firms. Market-to-Book is the market value of equity plus the book value of liabilities divided by the book value of total assets. Sales Growth is computed as the average sales growth over the previous five years or however many years are available on Global Vantage. Size is the log of the book value of total assets in $U.S., except when sales are employed as the deflator in which case size is the log of sales in $U.S. NWC is current assets minus current liabilities minus cash and equivalents. The dividend dummy is equal to one if the firm pays a dividend and zero otherwise. Cash Flow is operating income plus depreciation and amortization minus interest minus taxes minus dividends. Leverage is short-term plus long-term debt divided by the book value of total assets. ICAPX is the year-on-year change in net fixed assets plus depreciation. All regressions include industry dummy variables. Family Control Dummy is equal to one if more than half of the firms in a country are family controlled based on La Porta, Lopez-de-Silanes, and Shleifer (1999) and zero otherwise. Dividend Preference Dummy is equal to one if the dividend tax preference as computed by LLSV (2002) is larger than the sample median (0.70) and zero otherwise. Columns (i) and (ii) of panel C use data from 1997 and 1999, respectively. Columns (iii) through (vii) of panel C use weighted least squares where the weight is the inverse of the number of observations for each country. The numbers in parentheses are p-values based on robust standard errors.

Panel A. Construction of Variables

	Dependent Variable is the Logarithm of:				
Variable	Cash/ Assets (I)	Cash/ Sales (ii)	Cash/ Sales (iii)	Cash/ Sales (iv)	Cash/ Assets (v)
Shareholder Rights (level)		−0.23 (0.00)		−0.24 (0.00)	−0.15 (0.00)
Shareholder Rights (dummy)	−0.14 (0.00)		−0.23 (0.00)		
External Capital/GNP	−0.13 (0.02)	0.44 (0.00)	−0.14 (0.02)	0.42 (0.00)	0.08 (0.21)
Private Credit/GDP	0.36 (0.00)	0.29 (0.00)	0.18 (0.00)	0.48 (0.00)	0.39 (0.00)
Market-to-Book	0.11 (0.00)	0.05 (0.00)	0.04 (0.00)		
Sales Growth					0.04 (0.04)
Market-to-Sales				0.04 (0.00)	
Size Measured by Assets	−0.07 (0.00)	0.00 (0.97)	−0.01 (0.60)		−0.07 (0.00)
Size Measured by Sales				−0.11 (0.00)	
NWC/Net Assets	−0.84 (0.00)	−0.99 (0.00)	−1.08 (0.00)		−0.75 (0.00)
NWC/Sales				0.43 (0.00)	
Cash Flow/Net Assets	0.24 (0.01)	0.06 (0.46)	0.05 (0.54)		0.16 (0.05)
Cash Flow/Sales				0.12 (0.00)	
R&D/Sales	1.26 (0.00)	1.83 (0.00)	1.72 (0.00)	0.79 (0.00)	1.44 (0.00)
Constant	−2.82 (0.00)	−3.34 (0.00)	−3.42 (0.00)	−1.33 (0.00)	−2.30 (0.00)
Adj. R^2	0.19	0.22	0.20	0.27	0.19
N	8447	8447	8447	8447	8973

TABLE 5 (continued)
Robustness Tests of Pooled Cross-Country Regression

Panel B. Omitted Variables

Variable	(i)	(ii)	(iii)	(iv)
Shareholder Rights (level)	−0.11	−0.18	−0.17	−0.23
	(0.00)	(0.00)	(0.00)	(0.00)
External Capital/GNP	−0.14	0.07	0.07	0.26
	(0.02)	(0.25)	(0.30)	(0.02)
Private Credit/GDP	0.58	0.47	0.48	0.57
	(0.00)	(0.00)	(0.00)	(0.00)
Expropriation			−0.04	
			(0.13)	
Market-to-Book	0.08	0.11	0.12	0.13
	(0.00)	(0.00)	(0.00)	(0.00)
Size Measured by Assets	−0.01	−0.07	−0.06	−0.07
	(0.48)	(0.00)	(0.00)	(0.00)
NWC/Net Assets	−1.66	−0.79	−0.74	−0.97
	(0.00)	(0.00)	(0.00)	(0.00)
Cash Flow/Net Assets	0.02	0.30	0.25	0.22
	(0.84)	(0.00)	(0.01)	(0.02)
R&D/Sales	0.82	1.39	1.35	1.24
	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	−2.75			
	(0.00)			
Dividend Dummy	−0.07			
	(0.06)			
Dividends/Sales		2.68		
		(0.00)		
ICAPX/Net Assets	−0.001			
	(0.00)			
Family Control Dummy				0.16
				(0.15)
Dividend Preference Dummy				0.09
				(0.14)
Constant	−3.19	−2.82	−0.79	−2.92
	(0.00)	(0.00)	(0.00)	(0.00)
Adj. R^2	0.29	0.20	0.18	0.22
N	6689	8447	8420	7429

Panel C. Robustness over Time and across Subsamples

Variable	1997 (i)	1999 (ii)	WLS (iii)	Exclude Japan & USA (iv)	Civil Law Countries (v)	OECD Countries (vi)	G-7 Countries (vii)
Shareholder Rights (level)	−0.14	−0.30	−0.12	−0.12	−0.15	−0.12	−0.13
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
External Capital/GNP	0.09	0.24	0.15	0.21	−0.32	−0.06	−0.01
	(0.12)	(0.00)	(0.09)	(0.04)	(0.15)	(0.76)	(0.95)
Private Credit/GDP	0.26	0.71	0.16	0.09	0.36	0.18	0.46
	(0.00)	(0.00)	(0.03)	(0.33)	(0.00)	(0.01)	(0.00)
Market-to-Book	0.16	0.18	0.14	0.15	0.14	0.11	0.13
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Size Measured by Assets	−0.03	−0.06	−0.02	−0.01	−0.03	−0.04	−0.02
	(0.00)	(0.00)	(0.44)	(0.59)	(0.31)	(0.07)	(0.26)
NWC/Net Assets	−0.90	−0.50	−0.64	−0.61	−1.00	−0.92	−0.72
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Cash Flow/Net Assets	0.05	0.05	0.30	0.30	−0.03	−0.14	0.10
	(0.56)	(0.55)	(0.06)	(0.07)	(0.88)	(0.28)	(0.57)
R&D/Sales	1.17	1.04	1.36	1.35	1.48	1.01	1.17
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	−4.87	−0.80	−2.80	−3.87	−1.48	−2.42	−0.81
	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Adj. R^2	0.19	0.27	0.16	0.15	0.17	0.16	0.19
N	8069	7665	8447	4825	3325	7188	5785

shareholder rights that firms have more freedom in deciding whether to capitalize R&D expenses. However, the coefficient on capital expenditures is actually negative and significant, while the ratio of R&D to sales continues to have a positive effect on cash holdings.

We know from the work by LLSV (2000) that firms pay lower dividends in countries with little shareholder protection. Our finding indicates that these firms also hold more cash. Are these really independent results or are the cash holdings simply a consequence of the lower payout level? To investigate this possibility, we include the ratio of dividends to sales as an additional explanatory variable.[8] Column (ii), panel B of Table 5 contains the result. Shareholder rights remain important, which indicates that our finding is not merely a consequence of the evidence presented by LLSV on the relation between shareholder rights and dividends. Surprisingly, the coefficient on the dividend-to-sales ratio is actually positive and significant. The economic significance of this finding is quite small, however: increasing the ratio of dividends to sales from its 25th percentile (0) to its 75th percentile (0.0147) increases cash holdings by 3.5% only.

In model (iii), panel B of Table 5, we control for the risk of expropriation, which is the risk of confiscation or forced nationalization as tabulated by LLSV (1998); lower scores represent a higher risk. We would expect lower cash balances in countries with a high risk of expropriation, because it may be easier to confiscate cash than other assets. The sign on expropriation is actually negative, however, which is inconsistent with the expropriation story. It turns out that the risk of expropriation is highly correlated with the measures of capital market development. When we exclude the measures of capital market development, the coefficient on expropriation is 0.05, with a p-value of 0.01, which is consistent with the above argument. The importance of shareholder rights persists.

As mentioned previously, it is possible that controlling families use their companies to store wealth because taking the funds out through dividends is too costly in terms of taxes. We create two dummy variables to study the merits of this explanation. The first dummy is equal to one when more than half of the largest companies in the country are family controlled, based on the work of La Porta, Lopez-de-Silanes, and Shleifer (1999). The second dummy is equal to one when the advantage of dividends over capital gains is larger than the sample median (0.70), based on the dividend tax advantage computed by LLSV (2000). We would expect firms to hold more cash when family control is high and the dividend tax advantage is low. Column (iv) of panel B in Table 5 contains the results. The coefficient on the family control dummy is in the right direction, but not significant, while the coefficient on the dividend tax advantage dummy is in the wrong direction. The inclusion of these dummies has little effect on the magnitude or significance of the coefficients on the shareholder rights variable.[9,10]

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[8]Our findings are very similar if we employ the ratio of dividends to cash flows or dividends to net income.

[9]Both family control and the dividend tax preference are correlated with capital market development. If we re-estimate model (iv), but remove the capital market development variables, both dummies are in the right direction and statistically significant. However, the shareholder rights result remains unchanged.

[10]We perform one additional omitted variable test based on the work of Love (2002). She finds that firms hold more cash in countries with poor financial development. These may also be countries

Panel C of Table 5 explores the results for consistency over time and across various subsamples. Models (i) and (ii) repeat the basic regression analysis for the two years surrounding our sample year with similar results. The coefficient on shareholder rights in 1998 reported in Table 2 (−0.17) is in between those for 1997 and 1999.

Models (iii) through (vii) in Table 5 focus on subsamples. One concern about the firm-level regressions is that the results are caused by observations from large countries. The regressions at the country level reported in Table 4 suggest that this is probably not the case, but we subject this concern to further scrutiny. In model (iii), we estimate a weighted least squares model, where the weight of each observation is the inverse of the number of observations in each country, so that each country receives equal weight in the estimation. The impact of shareholder rights continues to be significant in this model. In model (iv), we exclude the U.S. and Japan, with similar results. In model (v), we examine civil law countries in isolation to determine whether our finding is more about the legal origin of a country or its protection of shareholders. Model (vi) contains the results for OECD countries only. These are countries with more similar capital market development. The coefficient on the shareholder rights dummy is still negative and significant in this specification. The regression indicates that the negative effect of shareholder rights persists within the civil law country subset. Finally, model (vii) shows that the findings also persist for G-7 countries.

We also examine whether our results hold for financially constrained firms, in light of Almeida et al.'s (2002) argument that cash levels are irrelevant for unconstrained firms. When we look at the subset of firms with zero dividends, assuming these firms are financially constrained, we continue to find that shareholder rights are significantly negative (not reported in Table 5).

We have also repeated all models in Table 5 using country and industry random effects. The coefficient on shareholder rights continues to be significantly negative in all specifications.

C.   Interactions between Firm Characteristics and Shareholder Rights

In the previous analysis, we assumed that the impact of firm characteristics on cash holdings is constant across countries. However, this does not need to be the case. In fact, the tradeoff theory of the determinants of corporate cash levels has implications for the effects of these variables across countries.

Let us first consider the transactions cost and precautionary motives. In our previous discussion, we assumed that the cost of raising funds was constant, except for a size effect: large corporations are assumed to be able to raise funds at a lower cost. The expected variation in cash holdings therefore comes from differences in the opportunity cost of lost investment. But, there are substantial differences across countries in the costs of raising funds, as demonstrated by LLSV (1997). This implies that firms should pay more attention to the opportunity cost variables in countries where raising funds is more difficult. The agency

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with poor shareholder protection. When we include the financial development variable constructed by Love (2002) in our regressions, the magnitude and significance of the shareholder rights variable are virtually unchanged.

cost hypothesis, on the other hand, suggests that the ease of raising money may actually lead firms to hold more cash when they have the ability to do so. To examine the validity of these arguments, we divide the countries into two groups according to the median ratio of external capital to GNP (cutoff is 0.25) and also in two groups according to the median ratio of private credit to GDP (cutoff is 0.645). We then create dummy variables equal to one if a firm is in a country with well-developed equity/debt markets. These dummies are then interacted with the two key variables used to capture opportunity costs and asymmetric information: the market-to-book ratio and the ratio of R&D to sales.

Column (i) of Table 6 contains the results of this enquiry. Note that we do not include capital market size itself, because the prior discussion indicates that its importance should only be relevant to the extent that it affects the magnitude of the other explanatory variables. The results are striking and not fully consistent with the transactions cost or precautionary motives for cash holdings. The coefficient on market-to-book itself is positive, but insignificant. The interaction with the large equity market dummy is insignificant, but the interaction with the large debt market dummy is positive and significant. This result implies that the market-to-book ratio is more important in deciding how much cash to hold when debt markets are larger, which is more consistent with an agency cost explanation: firms hold more cash when they have the ability to raise more funds. The results on the R&D interactions are insignificant. Thus, the cash holdings of more opaque firms are not affected by the size of the capital market. Note that shareholder rights continue to have a significant negative impact on a firm's holdings of cash and equivalents.

In column (ii) of Table 6, we interact market-to-book and R&D with a high shareholder rights dummy. The goal here is to determine whether, as predicted by the agency cost motive, managers care more about the variables that affect cash holdings when shareholder rights are high. Our evidence provides some support for this conjecture. The market-to-book ratio has a significant impact on cash holdings in countries with low shareholder rights, but its impact is more substantial in countries with high shareholder rights. Adding up the coefficient on market-to-book and its interaction with the high shareholder rights dummy, we find a coefficient of 0.14, with a p-value of 0.00. To interpret this effect, moving from the 25th percentile of the market-to-book ratio (0.96) to the 75th percentile (1.75), increases cash holdings by about 6% in countries with low shareholder protection and by 12% in countries with high shareholder protection. Thus, managers in countries where shareholders have few rights appear to take into account other factors when considering how much cash to hold. Regarding R&D, we do not find that the impact of the R&D to sales ratio on cash holdings depends on the level of shareholder protection.[11]

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[11]An alternative way of analyzing this issue is to estimate regressions on a country-by-country basis and report average coefficients on the shareholder rights variables by country. The problem with this estimation is that many countries have relatively few data points. If we estimate a model with five explanatory variables plus (up to) 66 industry dummies for each country, we obviously lose a lot of countries/observations. For example, if we limit ourselves to countries with at least 75 observations, we are left with 21 countries. For this sample, the average coefficient on the market-to-book ratio for countries with high shareholder rights is 0.11, while the average coefficient for countries with low shareholder rights is 0.08. The p-value of a difference test is only 0.30, however.

TABLE 6
Pooled Cross-Country Regression: Interactions

Variable	(i)	(ii)	(iii)	(iv)	(v)
Shareholder Rights (level)	−0.11 (0.00)	−0.13 (0.00)	−0.13 (0.00)	−0.06 (0.00)	−0.14 (0.00)
Market-to-Book	0.05 (0.17)	0.07 (0.00)	0.01 (0.78)		
M/B × High Ext. Cap./GNP	−0.03 (0.26)		−0.04 (0.11)		
M/B × High Priv. Cred./GDP	0.10 (0.01)		0.10 (0.01)		
M/B × High Shldr. Rights		0.07 (0.00)	0.07 (0.01)		
Need for External Financing				0.72 (0.00)	0.08 (0.61)
Need for Ext. Fin. × High Shldr. Rights					0.79 (0.00)
Size	−0.04 (0.00)	−0.04 (0.00)	−0.04 (0.01)	−0.02 (0.19)	−0.02 (0.18)
NWC/Net Assets	−0.81 (0.00)	−0.78 (0.00)	−0.79 (0.00)	−0.55 (0.00)	−0.54 (0.00)
Cash Flow/Net Assets	0.23 (0.01)	0.23 (0.01)	0.23 (0.01)	0.19 (0.12)	0.19 (0.12)
R&D/Sales	1.43 (0.00)	1.23 (0.00)	1.41 (0.00)	1.19 (0.00)	1.15 (0.00)
R&D/Sales × High Ext. Cap./GNP	0.44 (0.42)		0.10 (0.83)		
R&D/Sales × High Priv. Cred./GDP	−0.56 (0.31)		−2.76 (0.06)		
R&D/Sales × High Shldr. Rights		0.07 (0.60)	2.56 (0.09)		
Constant	−2.42 (0.00)	−2.18 (0.00)	−2.20 (0.00)	−1.75 (0.00)	−1.48 (0.00)
Adj. R^2	0.18	0.18	0.18	0.19	0.19
N	8445	8447	8445	3904	3904

The dependent variable is the logarithm of cash and equivalents divided by net assets. Net Assets are total assets minus cash and equivalents. All variables and interaction terms preceded by "high" are zero to one dummies (high means above the median). The Shareholder Rights variable goes from zero to five. Market-to-Book is the market value of equity plus the book value of liabilities divided by the book value of total assets. External Capital is the stock market capitalization held by minority shareholders. Private Credit is the credit provided by deposit money banks and other financial institutions to non-government-owned firms. Need for External Financing is the U.S. industry median level of the fraction of capital expenditures not financed with cash flow from operations from 1980–1990 from Rajan and Zingales (1998). Size is the log of the book value of total assets in $U.S. NWC is current assets minus current liabilities minus cash and equivalents. Cash Flow is operating income plus depreciation and amortization minus interest minus taxes minus dividends. All regressions include industry dummy variables, defined at the two-digit SIC code level. The numbers in parentheses are p-values based on robust standard errors.

To make sure that shareholder rights do not proxy for capital market development, model (iii) combines the interactions of models (i) and (ii). The impact of shareholder rights on the effect of the market-to-book ratio persists in this regression. In addition, the interaction between the R&D to sales ratio and the shareholder rights dummy is also positive, which implies that opaqueness is a more important determinant of cash holdings in countries with good shareholder protection.

The last two columns of Table 6 contain the results of our final test on the importance of shareholder rights in different institutional settings. In previous tests, we included the market-to-book ratio to capture investment opportunities. We now consider a more direct measure of the need for external financing, which is a measure of an industry's dependence on external financing developed by Ra-

jan and Zingales (1998). For their study of the impact of financial development on growth, Rajan and Zingales (1998) compute such a measure using U.S. data, based on the view that capital markets are relatively frictionless in the U.S. We employ this data item for two purposes. First, we examine whether firms with greater financing needs hold more cash. One may argue that this variable better captures the transactions cost motive than the market-to-book ratio since it focuses exclusively on financing needs, and not investment opportunities. Second, we interact financing needs with our high shareholder rights dummy to determine whether firms care more about financing needs when shareholder rights are strong.

The regression in column (iv) of Table 6 contains the need variable but not the interaction; as expected, firms hold more cash when they operate in industries with higher needs for external financing. Note that we have fewer observations in this model because Rajan and Zingales (1998) compute the need variable for manufacturing firms only. In column (v), we interact the need variable with a high shareholder rights dummy. The need variable is no longer significant in this model; only the interaction term is relevant. Thus, firms hold more cash when the need for external financing is greater only in countries where shareholders enjoy good protection. This supports the agency costs hypothesis: in countries where shareholders are not well protected, firms hold cash for other reasons; in countries where they are well protected, firms care more about the transactions cost motive.

V. Conclusion

When managers decide how much cash to hold in the firm, do they care only about shareholder wealth or about their personal well being as well? Our evidence indicates the latter: agency problems are of primary importance in determining cash holdings. Using data on more than 11,000 companies from 45 countries, we find significantly higher cash holdings in countries where shareholders enjoy little protection. Moreover, the other determinants of cash holdings appear to be less important in such countries. None of the evidence points to managers holding more cash simply because it is more difficult to access capital markets in countries with poor shareholder protection. If anything, firms hold more cash when it is easier to raise funds. These results remain after controlling for dividend payments, which indicates that our findings are not simply a consequence of LLSV's evidence that dividend payments are lower in countries with low shareholder protection.

We have performed a battery of robustness checks to reduce the possibility that our results are caused by measurement problems due to international differences in accounting data. Nevertheless, it is not possible across a large set of countries to capture the subtleties of differences in the accounting treatment of many of the variables we employ. This is clearly a caveat of this study

What we did not investigate in this paper are the consequences of having "excess cash." The evidence by Harford (1999) suggests that, even in the U.S., where shareholders are well protected, managers with "too much" cash on their hands waste it on poor acquisitions. Opler et al. (1999) find less evidence that excess cash gets wasted, but this may be because this is less likely to happen in the U.S.

Nevertheless, they do find that firms with large amounts of excess cash appear to lose more money in the future. Mikkelson and Partch (2003), on the other hand, find that the operating performance of firms with large cash holdings does not differ from that of a size- and industry-matched control sample. However, they focus on firms who hold their cash balances for at least five years. By definition, these firms have not wasted the resources. Investigating the consequences of high cash holdings in an international setting is clearly an important area of future research.

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