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Corruption and International Valuation: Does Virtue Pay?

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Comments Welcome

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Abstract

Using firm-level data from 46 countries, we investigate the relation between corruption – the misuse of public office for private gains – and international corporate values. Our analysis shows that firms from more (less) corrupt countries trade at significantly lower (higher) market multiples. This result is robust to the inclusion of many control variables suggested by valuation theory. On average, an increase in the corruption level from that of Singapore to that of Mexico corresponds to a decrease of 18.1 in the PE ratio, and a decrease of 1.17 in the PB ratio. We conclude that corruption has significant economic consequences for shareholder value.

1. Introduction

The laws within a country, and the quality of their enforcement, are potentially important determinants of shareholder value. Investors rely on a country's judicial/legislative system to ensure their claims to an enterprise's future cash flows are honored. A country's legal and regulatory system also affects the ability of its firms' to raise capital, hire employees, and explore new investment opportunities. In all these endeavors, a corporate manager must rely on the stability of the judicial/legislative system, and the efficacy with which its laws are enforced.[1]

In this study, we investigate the relation between shareholder value and corruption – defined as the *misuse of public office for private gain*. Corruption has emerged as a major issue in the global economy. Recent academic studies have examined the effect of corruption on a wide range of social and economic phenomena, including economic growth, direct foreign investment, and the quality of health care and educational services.[2] A number of international organizations also have an on-going mandate to combat corruption.[3] However, little is known about how the level of corruption in a country might affect the valuation of its corporations to shareholders.

Using firm-level data from 46 countries, we examine the empirical relation between corruption, as measured by Transparency International's Corruption Perception Index (CPI), and international corporate values.[4] Our analysis takes advantage of recent advances in valuation theory and estimation techniques to control for country-, industry-, and firm-level characteristics that affect cross-border valuation. We show that these factors explain a substantial portion of the variations in firm values internationally. Moreover, we document a significant empirical relation between the level of corruption within a country and corporate values.

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[1] For a comprehensive discussion of the relation between law and finance, see La Porta et al. (1998).

[2] For example, Mauro (1995) investigates the effect of corruption on economic growth, Wei (1997) examines the effect of corruption on direct foreign investments, and Gupta et al. (2001) evaluates the association between corruption and the quality of healthcare and educational services.

[3] For example, the International Monetary Fund (IMF; www.imf.org), the World Bank (www.worldbank.org), the Organization for Economic Co-operation and Development (OECD; www.oecdwash.org), Transparency International (www.transparency.org) and Community Information, Empowerment and Transparency (CIET; www.ciet.org).

[4] We discuss the composition of the CPI and the robustness of the results in detail later in the paper.

Specifically, our analysis shows that firms from more (less) corrupt countries trade at significantly lower (higher) market multiples. This result is robust to the inclusion of many control variables suggested by valuation theory – i.e., cross-sectional variations associated with profitability, expected growth, risk, and R&D expenditures. In addition, we control for country-level variations in inflation, real GDP growth, GDP per capita, as well as proxies for shareholder rights and corporate governance. Even after controlling for these variables, we find that an increase in the corruption level from that of Singapore to that of Mexico results in a decrease of 18.1 in the price-to-earnings ratio (PE), and a decrease of 1.17 in the price-to-book ratio (PB).

Our study builds on, and extends, two main streams of research. First, we extend the valuation research on the relative pricing of firms using market multiples to an international arena. Specifically, our results show that a set of economic drivers of firm value that was successful in explaining market multiples in the United States (e.g., Bhojraj and Lee (2001)) can be adapted to explain global valuations with the addition of certain country-level factors. In fact, our results demonstrate the relative importance of country-, industry-, and firm-level variables in explaining variations in P/E and P/B multiples across countries.

Second, we extend the evidence on the economic consequences of corruption. In an increasingly integrated global economy, interest in (and awareness of) the effects of corruption is on the rise.[5] While presumption of the damaging effects of corruption is widespread, direct evidence on its economic consequences has been scarce. Contributing to the problem is the pervasive nature of corruption. Because corruption is associated with a variety of other social and economic ills – including anemic economic growth, reduced foreign investment, reduced shareholder protection, lower healthcare and education spending – its direct impact on corporate values can be difficult to isolate.

Our study tackles this empirical challenge in several ways. First, we use firm- and industry-level data to increase the power of the tests. Second, we use numerous control variables to proxy for a

[5] The international press is rife with coverage about corruption, ranging from drug-enforcement problems in Mexico, to Russia's vast gray economy. Corruption has been the subject of recent speeches by numerous world leaders, including Chinese Prime Minister Li Peng, South Korea's Kim Young Sam, and the president of the World

variety of other country-level factors that are correlated with corruption. Third, we use an instrumental variable approach to parse out the effect of corruption. After controlling for other factors, we document a significant empirical relation between country-level corruption and cross-national corporate valuation. While these results likely understate the total effect of corruption, they do provide support for the view that corruption has significant economic consequences.

The remainder of the paper is organized as follows. In Section 2, we briefly review the vast literature on corruption, and discuss the theoretical link between corruption and shareholder value. In Section 3, we address issues in international valuation and the theory that underpins our empirical tests. This section also describes our sample, and motivates the various explanatory characteristics used in the study. Section 4 reports our empirical findings. Finally, in Section 5 we conclude with a discussion of the implications of our findings.

2. Corruption and Shareholder Value

In this section, we define the concept of corruption, discuss prior research on the determinants of corruption, and address measurement issues. We also discuss how the level of corruption in a country might affect corporate values.

2.1 What is Corruption?

Corruption is most commonly defined as the *misuse of public office for private gain* ((Klitgaard (1991; page 221), Transparency International (1995; pages 57-58), and Shleifer and Vishny (1993; page 599)). It is a concept that extends beyond the act of bribery to encompass a wide range of behavior associated with the exercise of discretionary power in the public sector. Because every government in the world spends money, collects taxes, and otherwise regulates its citizens, all are susceptible to corruption. However, the incidence of corruption, and the prominent forms that it takes, varies across countries.[6]

Bank. For information on the efforts of the World Bank and IMF to combat corruption, see Rose-Ackerman (1997, page 93).

[6] Elliott (1997) highlights the prominence of corruption in the global economy, and provides many examples.

2.2 What gives rise to corruption?

What gives rise to corruption? Most studies that address this subject frame the discussion in terms of a balancing act between the expected cost of a corrupt act and its expected benefits. For example, Jain (2001, 77) observed:

> [The] existence of corruption requires three elements to co-exist. First, someone must have discretionary power. Broadly defined, this power would include authority to design regulations, as well as to administer them. Second, there must be economic rent associated with this power…Third, the legal/judicial system must offer sufficiently low probability of detection and/or penalty for the wrongdoing. In an extension of Becker's (1968) 'crime and punishment' argument, the first two elements combine to create incentives for corruption and the third acts as a deterrent. Corruption occurs when higher rents are associated with misuse of the discretionary powers, net of any illegal payments and penalties associated with such a misuse.

In one of the most comprehensive studies on the subject, Treisman (2000) argues that this cost-benefit analysis should consider social and psychological, as well as financial, factors. He examines the relation between indices of "perceived corruption" (discussed in the next subsection) and a country's historical, cultural, economic, and political characteristics.

He finds that countries with lower corruption tend to be largely Protestant, former British colonies, have higher per capita income, a common law (versus civil law) legal system, a high ratio of imports to GDP, long exposure to democracy, and a unitary form of government. The direction of causality on economic development (per capita income) runs both ways. Treisman (2000) argues that these findings are broadly consistent with the theory on the expected costs and benefits of committing a corrupt act.[7]

[7] Treisman (2000) also tests and finds a number of factors nominated by theory to be insignificant in explaining corruption. Among these are: the relative salaries of the public sector, the degree of political stability, the endowment of natural resources, the degree of state intervention in the economy (in the form of regulation or taxation), and the level of ethnic diversity.

Treisman's findings corroborate well with results from other studies. For example, La Porta et al. (1999) find that less developed countries, countries with higher Catholic or Muslim populations, and countries with French or socialist laws (in contrast to common laws), tend to have inferior measures of government performance, including higher corruption. Similarly, Rose-Ackerman (2001) shows that while the current degree of democracy is unimportant in explaining corruption, corruption does decrease after longer exposure to a democratic structure.

In sum, prior studies find that the level of corruption in a country is a function of its historical, religious, and cultural roots, and that corruption is also related to the level of economic development in the country, as well as its legal and governmental system. Taken individually, these variables do not appear to be prime candidates in explaining international equity values. However, we include a number of these measures as controls or instrumental variables in our tests.

2.3 How is Corruption measured?

Most recent studies on corruption have used indices of "perceived" corruption prepared by business risk analysts and polling organizations, based on survey responses of businessmen and local residences. Among the most comprehensive indices are the Business International (BI) ratings, the International Country Risk Guide (ICRG) index, and the Transparency International (TI) composite corruption score.[8]

While these ratings are by definition "subjective", there are compelling reasons to take the patterns they reveal seriously. First, the ratings tend to be highly correlated with each other. Different organizations using different techniques derive ratings that are similar and do not change much from year to year. As Treisman (2000) observed, indices of relative corruption constructed from the surveys of business people operating in specific countries turn out to be highly correlated with cross-national polls of the inhabitants of these countries. This reduces the chances that the results reflect the biases of a particular monitoring organization.

[8] See Jain (2000), pages 76-77 for a more complete listing.

Second, empirical work confirms that these subjective ratings are correlated with a wide variety of economic and social phenomena. However subjective these evaluations might be, they appear to have explanatory power in many contexts. For example, Mauro (1995) shows that corruption lowers investment and impedes economic growth. Wei (1997) finds that an increase in corruption lowers the amount of direct foreign investment. Corruption also reduces government tax revenue (Ul Haque and Sahay (1996), Tanzi and Davoodi (1997)), Johnson et al. (1999)) and decreases spending on operations and maintenance, such as medicine and textbooks (Tanzi and Davoodi (1997)).

In more recent studies, measures of relative corruption have been linked to other social and economic phenomena. For example, higher corruption is associated with rising military spending (Gupta, de Mello, and Sharan (2000)), higher child mortality rates and higher student dropout rates (Gupta et al. (2001)). Higher corruption also increases the size of the unofficial economy (Johnson et al. (1998)), and is related to higher relative spread on sovereign bonds (Ciocchini, Durbin and Ng (2002)) and Hall and Yago (2000)).

In short, although these corruption indices are subjective measures of individuals' perception, they appear to capture an important conceptual construct, which manifests itself in a variety of other forms in society. The picture that emerges from this literature is that the social and economic effects of corruption are significant, pervasive and generally negative.

In this study, we used four annual issues (1995 through 1998) of the Corruption Perception Index (CPI) prepared by Transparency International. The CPI is a "poll of polls", reflecting composite information from up to 12 individual surveys and ratings. The respondents are business people, risk analysts, and the general public. A country must be covered by at least three surveys to be included in the CPI. We chose this index because of its comprehensive coverage, and because it incorporates the results of other major indices. A copy of the index, as well as details on how it is constructed can be obtained from the Transparency International web site (www.transparency.org).[9]

[9] As a robustness check, we replicated our tests using the corruption rankings from the International Country Risk Guide (ICRG) and obtained very similar results. The ICRG index is among the surveys included in the CPI.

The Transparency International CPI index is scaled so that it can range from 1 to 10. This index is a measure of "cleanness" rather than "corruption," because more corrupt countries receive a lower CPI score. Throughout this study, we reverse the coding by subtracting the CPI from 10, so that our measure of corruption ranges from 9 (extremely corrupt) to 0 (extremely clean).

2.4 Corruption and Shareholder Value

The dependent variables for our analysis are the price-to-book (PB) and price-to-earnings (PE) ratios of individual firms. Valuation theory provides guidance on the economic determinants of these ratios. In the next section, we develop this theory in much greater detail. However, it might be useful to first assess how corruption might affect shareholder value in broad terms.

As we will show in the next section, the price investors are willing to pay for a firm's earnings (or book value) is primarily driven by the firm's expected profitability, future growth (g) and level of risk (i.e., its cost of capital (r)). The theoretical literature identifies at least three channels through which corruption can affect these economic drivers of firm value.

First, corruption can drive up price and lower the level and quality of government output and services (Shleifer and Vishny (1993)), including those services that have a direct effect on corporate activities. As we show later, higher corruption is indeed associated with higher inflation. Presumably in such environments investors will demand a higher expected return on their capital. A higher cost of capital has the effect of lowering the price paid per unit of earnings or asset, thus lowering P/E and P/B ratios.

Second, corruption can reduce investment and retard economic growth. The empirical evidence shows that higher corruption is associated with lower investments and economic development (Mauro (1998), Kaufmann et al. (1999b)) and lower direct foreign investment (Wei (1997)). Growth is, of course, one of the key drivers of corporate values. To the extent that corruption lowers expected growth (g), we would anticipate that firms in more corrupt countries will trade at lower P/E and P/B multiples.

Kaufmann, Kraay, and Zoido-Lobaton (1999a, 1999b) criticize the Transparency International measure, and

Third, corruption can reduce legal protection of shareholders, particularly minority shareholders. In many countries, large publicly traded firms are not widely held, but have controlling shareholders. These shareholders have the power to expropriate minority shareholders and creditors, within the constraints imposed by law. Corruption reduces the effectiveness of regulatory oversight against this type of expropriation, which can lower the value of a firm to shareholders.

Consistent with this scenario, La Porta et al. (LLSV, 2001) show that firms from countries with better investor protection laws have higher Tobin's q. Their study uses the origin of a country's laws (Common versus Civil) and the index of specific legal rules as indicators of shareholder protection. As we have seen earlier, the origin of a country's law is also correlated with corruption. It is difficult to distinguish whether corruption per se, or shareholder protection, is the primary theoretical construct that accounts for the results in La Porta et al. (2001).

Our sense is that corruption encompasses a broader set of social behavior than is captured by shareholder protection. For example, public corruption is likely to be mirrored by similar behavior in the private sector. To the extent that unethical behavior in general increases contracting and monitoring costs, the adverse effect of corruption on corporate values can extend beyond legal protection of shareholders. In later tests, we evaluate the incremental effect of corruption by including such variables as the LLSV index of shareholder protection (Antidir), the efficiency of the judicial system (Judsys), and the level of Accounting Standards (Accstand) as control variables.

As discussed earlier, the pervasive nature of corruption and the insidious nature of its effect on other economic variables, can pose a significant challenge to empirical researchers. In addition to the three control variables just described, we include a large number of other related country-level measures: Inflation, real GDP growth (GDPg), import as a percentage of GDP (Import/GDP), GDP per capita (GDP/cap), the country's stock market beta (Beta), as well as its

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advocate an alternative estimation technique. However, their measure is not available for periods before 1997.

currency exchange beta (Ex_beta). To the extent that these variables are affected by corruption, our results will understate the total effect of corruption on firm valuation.

3. Valuation Theory and Model Estimation

The dependent variables for our analysis are the price-to-book (PB) and price-to-earnings (PE) ratios of individual firms. In this section, we present the valuation theory that identifies the economic determinants of these ratios. We also motivate the empirical constructs used to estimate our valuation model. Our discussion extends the multiple-based valuation approach in Bhojraj and Lee (2001) to an international setting.

3.1 Theoretical Determinants of Market Multiples

Valuation theory shows that explicit expressions can be derived for many market multiples using little more than the dividend discount model (DDM) and a few additional assumptions. For example, the residual income formula allows us to re-express the discounted dividend model in terms of the price-to-book ratio:[10]

$$\frac{P_t^*}{B_t} = 1 + \sum_{i=1}^{\infty} \frac{\left(ROE_{t+i} - r\right) B_{t+i-1}}{\left(1+r\right)^i \quad B_t} \qquad , \qquad (1)$$

where P_t^* is the present value of expected dividends at time t, B_{t+i} = expected book value at time t+i; r = cost of equity capital; and ROE_{t+i} = return-on-equity, the expected after-tax return on book equity for period $t+i$.

This equation shows that a firm's price-to-book ratio is a function of its expected return-on-equity (ROE), its cost-of-capital (r), and its future growth rate in book value (B_{t+i}/B_t). Firms that have higher expected ROE, lower r, and higher growth rates, will trade at higher price-to-book ratios. In other words, the primary drivers of the P/B ratio should be its expected ROE, its cost of capital, and its expected rate of growth.

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[10] This equation can be derived from the DDM with the additional assumption of the "clean surplus relation" ($B_t = B_{t-1} + NI_t - DIV_t$). The resulting formula, often referred to as a "residual income" valuation model, has been the subject of considerable recent interest in the accounting literature. See Feltham and Ohlson (1995) or Lee (1999) and the references therein for details.

Accounting diversity problems across countries are minimized by the complementary nature of P/B and ROE. In brief, firms in countries with more conservative accounting practices will have lower book values (relative to their economic value). This results in higher P/B ratios, but also higher ROE measures. Therefore, at least in theory, this model is robust to differences in accounting practices across countries.[11]

In the same spirit, it is not difficult to derive the price-to-earnings ratio in terms of expected growth rates, the dividend payout ratio, and the cost of capital. In the case of a stable growth firm, the price-to-earnings ratio can be expressed as:

$$\frac{P_t^*}{E_t} = \frac{k\ (1+g)}{(r-g)} \qquad , \qquad (2)$$

where P_t^* is the present value of future dividends at time t, E_t = earnings at time t; k is a constant dividend payout ratio (dividends as a percentage of earnings); r = cost of equity capital; and g is the expected earnings growth rate.

In the more general case, we can model the firm's growth in terms of an initial period (say n years) of high growth, followed by a period of more stable growth in perpetuity. Under this assumption, a firm's price-to-earnings ratio can be expressed as:

$$\frac{P_t^*}{E_t} = k\left[\frac{(1+g_1)(1-((1+g_1)^n/(1+r)^n))}{r-g_1} + \frac{(1+g_1)^n(1+g_2)}{(1+r)^n(r-g_2)}\right] \quad , \qquad (3)$$

where P_t^* is the present value of future dividends at time t, E_t = earnings at time t; k is a constant payout ratio; r = cost of equity capital; g_1 is the initial earnings growth rate, which is applied for n years; and g_2 is the constant growth rate applicable from period n+1 onwards.

[11] The theoretical model features an infinite horizon forecast of future cash flows. In practice, valuation models involve finite horizon forecasts, which introduce estimation errors that could be a function of a country's accounting practices. See Frankel and Lee (1999) for more details.

Equation (3) shows that a firm's P/E ratio should be a function of its dividend payout ratio (k), expected growth rates (g_1 and g_2), and cost of capital (r). If the market value of equity approximates the present value of expected cash flows, these variables should explain a significant portion of the cross-sectional variation in the P/E ratio. In the tests that follow, we employ a multiple regression model to explain cross-national P/B and P/E ratios. The explanatory variables we use in the model are empirical proxies for the key elements in the right-hand-side of Equations (1) and (3).

3.2 Sample Selection

Our initial sample of firms is derived from the Worldscope database. To complement the corruption index data from Transparency International, we focused our analysis on the 1995 to 1998 time period.[12] We required that each firm's home country (both country of origin and country of domicile) be clearly identified in the Worldscope database, and that the country is included in the Transparency International CPI rankings.[13]

We obtained the total market capitalization for each firm based on closing market prices as of June 30th of each year. In addition, we required the availability of the following data items, measured as of the most recent fiscal year end: total common equity, total long-term and short-term debt, operating income, total assets, research and development expenditure, fiscal year-end date, and currency denomination.[14] In addition, we required each firm to have a one-year-ahead and a two-year-ahead consensus earnings forecast in the I/B/E/S International database as of the June statistical period each year. We derive a forecasted growth rate from these two earnings forecasts (see Appendix B for details).[15]

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[12] We also had 1999 data. However, the introduction of the Euro in January 1999 complicated the computation of P/B and P/E ratios (accounting variables and prices were not always in the same currency). To avoid these problems, we limited our analysis to pre-1999 data.

[13] Because of their peculiar status, American Deposit Receipts (ADR's) are excluded. There are three ways by which we identify the ADR's. First, Worldscope marks some firms with an ADR indicator. Second, the names of some firms are clearly labeled as ADR's. Third, some firms have a country of origin that is different from their country of domicile. We exclude all three.

[14] To ensure that the accounting variables are available to the public and are reflected in firm price, the market price in June is matched to accounting data from a fiscal year that ended in the prior January or earlier.

[15] In an earlier draft, we also used a separate sample based on historical growth rates to proxy for expected growth. Firms in the historical growth sample were required to have three past years of operating income available from

We exclude firms with negative common equity, negative current earnings, negative one-year-ahead forecasted earnings and negative earnings in year t+2. In addition, to facilitate the estimation of a robust model, we rank firms annually on various attributes and exclude observations in the top and bottom 3% by price-to-book, price-earning, leverage, return-on-equity, and forecasted growth rates. After these filters, we obtained 19,979 firm-year observations.

3.3 Model Estimation

Our research design involves the use of regression models that attempt to explain cross-national variations in P/E and P/B ratios. For this purpose, we compute four firm-level, and two industry-level, explanatory variables. We are guided in the choice of these variables by the valuation equations discussed earlier. Following the methodology developed by Bhojraj and Lee (2001), we attempt to estimate relatively simple models that capture the key theoretical constructs of growth, risk, and profitability.

Specifically, our model includes the following variables, which are also summarized and described in more detail in Appendix B:

Indpb – The harmonic mean of the price-to-book multiple for all the firms with the same two-digit SIC code for a given year.[16] This variable controls for industry-wide factors, such as growth rates and level of risk, and we expect it to be positively correlated with current year firm-specific PB ratios. It is used only in the PB regressions.

Indpe – The harmonic mean of the price-to-earnings multiple for all firms with the same two-digit SIC code for a given year. It controls for industry-wide factors and is only used in the PE regressions.

Worldscope. Since the number of observations was similar and the key results are unaffected, we do not report these results separately.

[16] We use the harmonic means of industry PB and PE ratios, that is, the inverse of the average of inversed ratios, because they are more robust results than industry medians in these applications (See Baker and Ruback (1999)).

Roe – Return on equity. This variable is net income before extraordinary items scaled by the end of period common equity. We expect this profitability measure to be a key driver of cross-sectional variations in the PB ratio. It is only used in the PB regression.

Forecastg – Forecasted earnings growth based on I/B/E/S estimates. This variable is computed as the percentage increase implicit in the two-year-ahead forecast relative to the one-year-ahead forecast. Higher growth firms merit higher PE and PB ratios.

Lev – Book leverage. This variable is computed as total debt expressed as a percentage of total book equity. Firms with no reported debt are assigned a value of zero. Levered firms are riskier, ceteris paribus. Moreover, Gebhardt et al. (2001) suggest this measure is correlated with a firm's implied cost of capital. We therefore expect this variable to be negatively correlated with the two dependent variables.

R&D – Total research and development expenditures divided by sales. Firms with higher R&D expenditures tend to understate current profitability relative to future profitability. To the extent that this variable captures expected earnings growth (and profitability) beyond Forecastg (and current ROE), we expect it to be positively correlated with the PE and PB ratios.

In addition to these industry and firm level variables, we also include seven country-level metrics as control variables:

Inflation and **GDPg** – These two macro-economic variables are suggested by valuation theory as potential factors in international valuation. Inflation is the annual inflation rate and GDPg is the annual real growth rate for each country. We expect inflation to be negatively correlated with firm values (see, for example, Nissim and Penman, 2001) and real GDP growth to be positively correlated. To ensure these measures were available to the public as of June each year, we used the prior year's numbers.

Judsys, Antidir, Acctstand – These three variables were featured in La Porta et al. (1998) as measures of the level of corporate governance and protection of minority shareholder rights.

Judsys is a measure of the efficacy of the judicial system, ranging from 0 (least efficient) to 10 (most efficient). Antidir is an aggregate index developed by La Porta et al. (1998) to capture shareholder rights within a country. Acctstand is a crude measure of the quality of financial reporting in a country, based on the inclusion or omission of 90 items in seven categories.

Import/GDP and **GDP/cap** – We also include two variables identified by past studies to be correlated with corruption. Import/GDP is the proportion of annual country imports divided by the annual country GDP, which prior studies found is positively correlated with corruption at the country level (Treisman (2000), Gupta et al. (2001)). GDP/cap, a measure of the wealth level of a country, is also correlated with corruption (Treisman (2000)). To ensure these measures are publicly available as of June 30th, we used measures that pertain to the prior calendar year. Although these two variables are not nominated by valuation, we include them as control variables in our regression. We also use them as instrumental variables in our two-stage least square regression.

Beta and Ex_Beta – Finally, we include two measures of country-level systematic risk. Market Beta (Beta) refers to the beta of the country stock index relative to the Morgan Stanley Capital Index (MSCI) world stock index. Exchange rate beta (Ex_beta) refers to the beta of the country stock index relative to an exchange rate index of the US dollar. To compute Beta and Ex_beta, we use the two-factor model:

$$r_{i,t} - r_f = a + b\,(r_{m,t} - r_f) + b^{e}\Delta e + m_{i,t}$$

The dependent variable is the monthly dollar return on the stock market index where the firm is located. We use returns on Morgan Stanley Capital Index (International Financial Corporation) country indices as proxies for country stock returns in industrial (developing) countries. The two factors on the right hand side of the regression are (i) the market factor ($r_m - r_f$), which is the excess dollar return of the value-weighted MSCI world market portfolio, and (ii) the currency factor (Δe), which is the return on the US dollar vis-à-vis the other six countries in the G7 (weighted by the relative stock-market capitalization). An increase in the index implies US dollar depreciated against the basket of currencies. The rolling 60-month index returns is used; Beta and the Ex_beta are the estimated coefficients from this regression.

To recap, our research design involves estimating a series of regressions of either the PB or PE ratio on these control variables, together with the corruption variable (Corrupt), based on the reported CPI figure. Transparency International releases its annual CPI result around July of each year. This measure ranges between 9 (highly corrupt) and 0 (highly clean). Appendix B contains further details on how each of these variables is calculated.

4. Empirical Results

4.1 Descriptive Statistics

Appendix A presents descriptive statistics on the Transparency International data for our sample of 46 countries. The countries are listed in rank order by their average corruption score over the four annual surveys. Also reported in this table is the average number of firms per year, the standard deviation of the corruption score across different years, the number of surveys used to compile that country's CPI (based on 1998 data) and the standard deviation of the corruption score from the different surveys (again based on 1998 data).

Over our sample period, Denmark, New Zealand, and Finland received the best corruption rankings while Pakistan, Indonesia, and Venezuela received the worse. Most of the countries were ranked for four years. Only five countries were ranked for two years or fewer. The average number of firms per year ranged from 1 (Brazil and Venezuela) to 1,690 (United States). The number of surveys used to compile a country's composite CPI score ranged from 3 to 12. The standard deviation of the scores from these surveys ranges from 0.4 (Malaysia) to 1.7 (Greece). These standard deviation statistics provide some indication of the degree of agreement among surveys as to a country's relative ranking.

Table 1 presents summary statistics on the two dependent and sixteen explanatory variables. Table values represent the means, standard deviations and various percentiles. We include one observation per firm-year, sampled as of June 30th. The sample is from 6/1995 to 6/1998. Notice that the country-level variables (Corrupt, GDPg, Inflation, GDP/cap, Import/GDP, Acctstand, Antidir, Judsys, Beta, and Ex_beta) are common across firms in the same country, and the industry-level variables (Indpb and Indpe) are common across firms in the same industry.

Overall these statistics appear reasonable, with no indication that data errors are likely to be a serious problem.

4.2 Pairwise Correlations

Tables 2 reports the pairwise correlations among firm and industry level variables. Table values in the upper triangle are Spearman rank correlation coefficients, table values in the lower triangle are Pearson correlation coefficients. We compute the correlation table annually and report the time-series mean of the annual correlations. We report statistical significance on the basis of the consistency of the cross-sectional correlations over the four sample years.

The price-to-book ratio (PB) is correlated with all the other variables in the expected direction. In particular, ROE is highly positively correlated with PB. PB is also positively correlated with both industry-level variables (Indpe and Indpb). Consistent with theory, PB is negatively correlated with Lev and positively correlated with R&D as well as forecasted growth.

The price-to-earnings (PE) ratio is also generally correlated with the other variables in the direction predicted by theory. In particular, as expected, firms with higher forecasted growth trade at higher PE multiples. PE is also positively correlated with R&D expense and industrial multiples (Indpb and Indpe). PE is negatively correlated with ROE, but some of the correlation is spurious (current earning appears in the numerator for the ROE calculation). Overall, Table 2 shows that most of the explanatory variables nominated by valuation theory operate as expected in the international setting.[17]

Table 3 reports the pairwise correlations among the country-level variables. This table illustrates the difficulty confronted by researchers seeking to isolate the effect of corruption. Four variables are significantly correlated with Corrupt: GDP/cap, Judsys, and Acctstand are negatively correlated, and Inflation is positively correlated. A fifth variable, Import/GDP, also exhibits

[17] To check the robustness of these relationships (and to ensure that our results are not driven entirely by firms from the United States), we also examined the correlation coefficients for the three countries with the largest number of firms in the sample: the United States, the United Kingdom, and Japan. The results (not reported) generally confirm the findings in the overall sample. In each country, forecasted growth and industry multiples are positively correlated with firm level PE and PB ratios. ROE is always positively correlated with PB and R&D is always positively correlated with both dependent variables. The only exception is book leverage, which is positively correlated with PE and PB among Japanese firms.

marginal negative correlation with corruption. In short, more corrupt regimes tend to have weaker judicial systems, less transparent accounting standards, higher inflation, lower GDP per capita, and lower import as a ratio of GDP. Our challenge will be to disentangle, as much as possible, the effect of corruption on corporate values.

4.3 Regression Analysis

Table 4 reports the results of a series of pooled time-series cross-sectional regressions estimated using data available as of June of each year. The dependent variable in these regressions is either the PB ratio (Panel A) or the PE ratio (Panel B). The independent variables are as described in the previous section. Table values represent estimated coefficients, based on a model with annual dummies and random country effects. T-statistics are reported in parentheses. Reported in the bottom rows are adjusted R-squares, the Hausman Chi-square statistic, and the number of observations per year.

We begin with a random effect model because it allows us to estimate the correlation matrix taking into account the country-level cross-correlations. The main advantage of this approach is that it produces a more efficient estimate than a fixed effect model. The main disadvantage is that the estimates are likely to be inconsistent. The random effect model maintains the severe assumption that any unobserved country effects in the error term are uncorrelated to the explanatory variables. In our case, the Hausman test statistics for these regressions show that the inconsistency introduced by the random effect model is severe for all four models. Therefore, for the remainder of our study, we use a fixed effect model with a separate dummy for each country.

Despite the known inconsistencies, Table 4 results are suggestive of a negative relation between Corrupt and firm values. In Models 1 and 3, we include only firm and industry control variables; in Models 2 and 4 we also include Inflation and GDPg. The results show that the estimated coefficient on Corrupt is significantly negative in all four models. Collectively, these variables explain around 40% of the variation in PB, and 10.5% of the variation in PE. The coefficients on the control variables are generally in the expected direction, with the exception of leverage, which is not significant for the PB regressions and positive for the PE regressions. Models 2 and

4 show that, consistent with valuation theory, GDPg is positively correlated with the market multiples, while Inflation is negatively correlated with these multiples. The correlation of Corrupt with firm values is lower in the presence of GDPg and Inflation, but it remains negative and significant in both models.

Table 5 presents the main results for this paper. In this table, we examine PE and PB ratios using a pooled regression with fixed annual and country effects. For each ratio, we estimate five models. Models 1 and 2 are benchmark estimations, which document the explanatory power of firm and industry variables, with and without country and yearly fixed effects. Model 3 illustrates the incremental effect of the corruption variable; models 4 and 5 further introduce various additional country-level control variables.

Panel A shows that all the firm and industry level variables have the predicted sign. Even without country and annual dummy variables, over 39% of the variation in P/B ratios can be explained by Indpb, ROE, R&D, Forecastg, and Lev. With the addition of country and yearly fixed effects, the adjusted r-square increases to 42.5%. Model 3 shows that Corrupt is incrementally important after controlling for the other variables. Model 4 shows that the addition of GDPg and Inflation has little effect on the Corrupt variable. Finally, Model 5 shows that Corrupt survives even with the inclusion of two variables known to be highly correlated with country-level corruption (Import/GDP and GDP/cap). It is worthwhile to note that neither of these latter variables is nominated by valuation theory and their explanatory power is probably attributable, to a large extent, to Corrupt. We address this issue later with an instrumental variable regression.

Panel B shows that Corrupt is also important in explaining PE ratios. As expected, PE is positively correlated with R&D, forecasted growth, and Indpe. Somewhat surprisingly, higher levered firms also receive higher PE multiples. This reversal of the univariate relation is perhaps due to the fact that forecastg does not fully incorporate the value of expected growth firm values. More importantly, the corruption measure is negative and significant in all three models in which it appears. Apparently firms from less corrupt countries earn higher PE multiples, controlling for the other factors.

It might be useful to consider the economic magnitude of these estimated coefficients. Panel A shows that a one unit increase in the corruption index corresponds to approximately a 0.20 decrease in the PB ratio. Panel B shows that a one unit increase in the corruption index corresponds to approximately a decrease of 3.1 in the PE ratio. In other words, an increase in the corruption level from that of Singapore (Corrupt score of 1.05) to that of Mexico (Corrupt score of 6.89) corresponds to a decrease of 18.1 in the PE ratio, and a decrease of 1.17 in the PB ratio.

4.4 Further Robustness Checks

Since Corrupt is a country-level measure, its ability to explain firm-level variations in PE and PB is likely to be affected by the inclusion of other country-level variables. The models we estimated already include country-level indicator variables, which control for unidentified variation at the country level. In addition, we have included country-level variables such as: Inflation, GDPg, GDP/cap, and Import/GDP. However, it is still possible that Corrupt is serving as a proxy for another omitted country-level variable. Obviously, we run the risk of over controlling and thus eliminating the underlying theoretical construct of interest. Nevertheless, in this section, we explore variations in the basic model.

In Table 5, we did not include the three corporate control and shareholder right variables (Judsys, Antidir, and Acctstand), because these measures do not change from year-to-year. As a result, their explanatory power is subsumed by the country-level fixed effect variables. However, it is possible that these variables have differential effects on firm value across the four years in our sample. In Table 6, we conduct additional robustness checks that consider this possibility, as well as several instrumental variable regressions that attempt to disentangle the effect of corruption from that of GDP/cap and Import/GDP.

In Table 6, we introduce interaction variables created by multiplying the year dummies with the three corporate control and shareholder rights variables: Judsys, Acctstand, and Antidir. The F-statistics and P-values on these variables show that introducing a time-varying component modestly improves the overall fit. More importantly, Model 1 shows that the effect of corruption on PB (Panel A) and PE (Panel B) is unaffected by these perturbations. In fact, compared to Table 5, the estimated coefficients on Corrupt are slightly more negative for both PE and PB.

Model 2 of Table 6 includes Import/GDP and GDP/cap in the regression. Neither variable is nominated by valuation theory per se, but both have been identified with corruption in past studies. We find that firms in countries with higher GDP/cap and higher Import/GDP have higher valuation multiples. The estimated coefficient on the corruption variable is smaller after adding these measures, but it remains significant for both the PB and the PE regression.

In Models 3 and 4, we attempt to parse out the effect of Corrupt using Import/GDP and GDP/cap as instrumental variables. The first-stage results show a high degree of fit (the adjusted r-square, reported in the table, is over 0.97), and the second stage results show that the fitted variable for corruption is strongly correlated with both PE and PB. If we believe that corruption has some effect on both GDP/cap and Import/GDP, then these results suggest that our earlier findings likely understate the effect of corruption on firm values.

As a further robustness check, we examine the effect of including proxies of country-level systematic risk in our analysis. Table 7 reports the results when we include a country's market beta (Beta) and currency exchange beta (Ex_beta). However, a country's market beta (Beta) has no significant incremental power in explaining PB ratios, and, contrary to theory, it exhibits a positive correlation with the PE ratio. We find that Ex_beta is negatively correlated with market multiples. More importantly, the coefficient on Corrupt remains significantly negative even with the inclusion of Beta and Ex_beta, as well as GDPg and Inflation.

4.5 Additional Analyses

So far, our findings show that the Corrupt variable is negatively correlated with market multiples after controlling for a wide set of other variables. In this subsection, we attempt to shed more light on the source of the correlation.

Table 8 examines *how* corruption affects firm valuation. In this table, we introduce interaction terms between corruption and several firm-level value drivers. Specifically, we define HiCorr = 1 if a firm is from a country that received a Corrupt score of above 5.5 on average over time, and 0 otherwise. Similarly, we define LoCorr = 1 if a firm is from a country that received on average

a Corrupt score of below 2.5, and 0 otherwise. These cutoff values partition our sample into roughly 3 equal-sized sets of countries: 15 low-, 16 medium-, and 15 high-corruption countries.

We are interested in understanding how corruption affects the usefulness of current profitability (ROE), R&D expenditures (R&D), and forecasted growth (Forecastg) as drivers of firm value. For example, if current profitability erodes quickly in highly corrupt regimes, we would expect a negative relation between HiCorr*ROE and PB. Similarly, if the benefits of current R&D or forecasted growth is lower for highly corrupt countries, we would expect negative coefficients on HiCorr*R&D and HiCorr*Forecastg, respectively. Conversely, if most of the effect derives from low corruption regimes, we would expect positive coefficients on the LoCorr interaction terms.

Table 8 shows that expected erosion in ROE and forecasted growth in high corruption regimes are important in explaining the relation between PB and corruption. In Panel A, both HiCorr*ROE and HiCorr*Forecastg are significantly negative. The coefficient on CorrLo*R&D and CorrLo*Forecastg are also marginally positive, suggesting that per unit of R&D expense and forecasted growth is worth more in low corruption countries. These results are consistent with the view that the greater uncertainty (or contracting costs) associated with higher corruption reduces the corporate value of R&D expenditures, current ROE, and forecasted growth. The results for the PE ratio (Panel B) are generally not significant. ROE is not included in the model but we find some evidence (in Model 2) that HiCorr*Forecastg is significantly negative.

Table 9 conducts separate regressions for industrial and developing countries. Because corruption is correlated with per capita GDP, we know that this test will weaken the explanatory power of the corruption variable in both sub-samples. However, we are interested in understanding the robustness of the results in both types of economies. To construct this table, we use the World Bank's International Financial Corporation (IFC) classification of Industrial and Developing countries. 21 (25) out of 46 of the countries in our sample were deemed by the IFC to be an Industrial (Developing) country.

As expected, Table 9 shows that the effect is weaker in both parts of the split sample. Corruption continues to be negatively correlated with both PB and PE in industrial countries, but has no incremental explanatory power for market multiples in the emerging country sub-sample. Part of the result is due to a lack of power in the developing country sub-sample, as we have only 3,268 to 3,418 observations. Moreover, the relative corruption in these countries tends to be similar, further reducing the power of this variable. In any event, it is clear from this table that our result is not driven by firms from a handful of developing countries.

Finally, Table 10 reports the results of estimations based on a maximum of 100 firms per country. One concern is that our results might be driven by a preponderance of firms from a few large countries. To construct this table, we limited our sample to the top 100 firms from each country by market capitalization. As expected, this restriction severely curtailed our sample (the total sample size decreases by more than 50%). Nevertheless, Table 10 shows that even in this highly restrictive sample, corruption is negatively correlated with firm values. As expected, both the statistical significance and the estimated coefficients are substantially lower than reported earlier, but the key inferences remain similar.

5. Conclusion

This study integrates the valuation literature in finance with a vast literature in political science and economics on corruption. Valuation theory demonstrates that the key economic drivers of firm value are growth, profitability and risk. However, little is known about how these drivers are affected by country-level factors in cross-national settings. In particular, we have no evidence on how corruption might affect international valuation.

As we demonstrate, the theoretical literature on corruption identifies at least three channels through which corruption might affect these economic drivers. First, corruption can drive up price and lower the level and quality of government output and services (Shleifer and Vishny (1993)), including those services that have a direct effect on corporate activities. Second, corruption can reduce investment and retard economic growth (Mauro (1998), Wei (1997), Kaufmann et al. (1999)). Finally, corruption can reduce legal protection of shareholders,

particularly minority shareholders (LaPorta et al. (2001)). Shareholders will demand a higher rate of return, on average, to compensate for this risk.

These arguments suggest that firms from more corrupt countries will trade at lower PE and PB multiples. Using firm-level data from 46 countries, we test this conjecture. Our tests show that firms from more (less) corrupt countries trade at significantly lower (higher) market multiples. This result is robust to the inclusion of many control variables suggested by valuation theory. In our primary estimations, we find that, on average, an increase in the corruption level from that of Singapore to that of Mexico corresponds to a decrease of 18.1 in the PE ratio, and a decrease of 1.17 in the PB ratio.

Although our corruption measures relate to a public sector phenomenon, this behavior is likely to be mirrored in private sector dealings as well. To our knowledge, the extent to which corruption in the public sector reflects corruption in the private sector has not been studied. However, if these two forms of corruption are positively correlated, it seems likely that both will affect contracting and monitoring costs within a country. The robustness of the corruption measure as an explanatory variable for international valuation, after controlling for many other variables, suggests to us that it might capture something beyond public sector misconduct. It is possible that our results reflect a broader phenomenon related to the cost of unethical conduct in general, both public and private. In essence, when trust cannot be assumed, contracting is more costly, and firm valuations are adversely affected. We regard this as in interesting area for further research.

As a minimum, our results suggest that a country's level of corruption has significant economic consequences for the shareholder value of its firms. These findings add to the growing literature on the effects of corruption. They also demonstrate how valuation techniques developed using data from the United States might be extended to an international setting. Given the number of country-level control variables included in this analysis, it is unlikely that the empirical relation we report is due to correlated omitted variables. In fact, we believe it is more likely that the effect we document understates the true impact of corruption on corporate values across international boundaries.

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Appendix A: Sample countries ranked by corruption score

	Country	Sample Period	Average no. of firms per year	Average Corruption Score	Standard Deviation of Corruption Across Years	No. of surveys used in CPI (1998)	Standard Deviation across surveys (1998)
1	Denmark	1995-1998	77	0.35	0.32	9	0.7
2	New Zealand	1995-1998	33	0.60	0.11	8	0.7
3	Finland	1995-1998	42	0.69	0.23	9	0.5
4	Sweden	1995-1998	95	0.80	0.24	9	0.5
5	Canada	1997-1998	105	0.97	0.13	9	0.5
6	Singapore	1995-1998	90	1.05	0.24	10	1.0
7	Netherlands	1995-1998	95	1.14	0.16	9	0.7
8	Norway	1995-1998	40	1.15	0.15	9	0.7
9	Switzerland	1995-1998	81	1.24	0.10	10	0.6
10	Australia	1995-1998	117	1.26	0.10	8	0.7
11	United Kingdom	1995-1998	598	1.52	0.18	10	0.5
12	Ireland	1995-1998	25	1.63	0.14	10	1.4
13	Germany	1995-1998	164	1.87	0.14	10	0.4
14	United States	1995-1998	1690	2.36	0.10	8	0.9
15	Israel	1996-1998	6	2.41	0.36	9	1.4
16	Austria	1995-1998	37	2.54	0.19	9	0.8
17	Hong Kong	1995-1998	64	2.70	0.30	12	1.1
18	Chile	1995-1998	27	3.10	0.68	9	0.9
19	France	1995-1998	234	3.17	0.15	9	0.6
20	Japan	1995-1998	356	3.47	0.46	11	1.6
21	Portugal	1995-1998	27	3.61	0.51	10	1.0
22	Belgium	1995-1998	53	3.92	0.76	9	1.4
23	South Africa	1995-1998	65	4.64	0.30	10	0.8
24	Malaysia	1995-1998	142	4.77	0.13	11	0.4
25	Spain	1995-1998	75	4.84	0.84	10	1.3
26	Taiwan	1995-1998	111	4.91	0.12	11	0.7
27	Poland	1996-1998	40	4.92	0.40	8	1.6
28	Czech Republic	1997-1998	25	5.00	0.20	9	0.8
29	Greece	1995-1998	79	5.18	0.48	9	1.7
30	Hungary	1995-1998	10	5.21	0.40	9	1.2
31	Peru	1998	10	5.50	--	6	0.8
32	South Korea	1995-1998	83	5.55	0.33	12	1.2
33	Italy	1995-1998	72	5.99	0.83	10	0.8
34	Brazil	1998	1	6.00	--	9	0.4
35	Slovakia	1998	3	6.10	--	5	1.6
36	Argentina	1995-1998	13	6.39	0.96	9	0.6
37	Turkey	1995-1998	22	6.44	0.33	10	1.0
38	Mexico	1995-1998	15	6.89	0.26	9	0.6
39	Thailand	1995-1998	56	6.96	0.19	11	0.7
40	Philippines	1995-1998	38	7.05	0.24	10	1.1
41	India	1995-1998	17	7.24	0.10	12	0.6
42	China	1995-1998	31	7.26	0.51	10	0.7
43	Colombia	1995-1998	6	7.35	0.50	9	0.8
44	Venezuela	1996-1998	1	7.48	0.19	9	0.8
45	Indonesia	1995-1998	50	7.67	0.36	10	0.9
46	Pakistan	1995-1998	15	7.88	0.67	3	1.4

Appendix B: Descriptions of Firm and Industry Specific Variables

Variables	Description	Calculation
Firm Level Variables:		
PB	Price-to-Book ratio	PB = Market value of equity/Total common equity.
PE	Price-to-Earnings ratio	PE = Market value of equity/Net Income before extraordinary items.
Roe	Return on Equity	Roe = Net Income before extraordinary items*100/Total common equity.
Forecastg	Forecasted earnings growth rate (from I/B/E/S)	Computed from I/B/E/S. Forecastg = (Forecasted earnings$_{t+2}$-Forecasted earnings$_{t+1}$) *100/Forecasted earnings$_{t+1}$
Lev	Book Leverage	Lev = Total debt*100/(Total assets-Total debt). Firms with no reported total debt are assigned a value of zero.
R&D	Research & Development-to-Net Sales	R&D = Research & development expense *100 / Net Sales. Firms with no reported R&D are assigned a value of zero.
Industry Level Variables:		
Indpb	Industry PB ratio	Harmonic mean of the PB ratio for all firms in the same industry (based on 2-digit SIC code).
Indpe	Industry PE ratio	Harmonic mean of the PE ratio for all firms in the same industry (based on 2-digit SIC code).
Country Level Variables:		
Judsys	Efficiency of the Judicial System	Measure of the "efficiency and integrity of the legal environment as it affects business, particularly foreign firms" produced by the country-risk rating agency *Business International Corporation*. This measure ranges from 0 (less efficient) – 10 (more efficient). La Porta, et. al. (1998)
Antidir	Anti-director rights	Index of the aggregation of shareholders' rights ranging from 0 (less rights) – 5 (more rights). La Porta, et. al. (1998)
Acctstand	Accounting Standard	Index based on the inclusion or omission of 90 items in 7 categories: general information, income statements, balance sheets, funds flow statements, accounting standards, stock data, and special items. La Porta, et. al. (1998)
Imports/GDP	Imports-to-Gross Domestic Product	Annual country imports divided by the annual country gross domestic product. Imports and GDP were collected from International Financial Statistics.
GDP/cap	Gross Domestic Product per capita (in thousands of US dollars)	Annual Gross Domestic Product per capita as compiled from the International Financial Statistics by the PRS group.
GDPg	Annual real GDP Growth Rate (%)	Annual real GDP growth as compiled from the International Financial Statistics by the PRS group.
Inflation	Annual Inflation Rate (%)	Annual inflation rate as compiled from International Financial Statistics data by the PRS group.
Beta	Country stock beta	The 5-year rolling beta for returns on country stock indices vis-à-vis the MSCI world stock returns.
Ex_beta	Country currency beta	The 5-year rolling beta for returns on the country stock indices vis-à-vis a stock wealth-weighted exchange rate index of US dollar.
Corrupt	Transparency International's Corruption Perception Index (CPI).	CPI is a measure of the degree of corruption as perceived by business people, risk analysts and the general public. This measure ranges between 9 (highly corrupt) and 0 (highly clean). Each country receives a composite score based on up to 12 surveys (see Appendix A).

Table 1: Summary Statistics

Variables	Mean	Std Dev	1%	10%	25%	50%	75%	90%	99%
PB	2.72	1.97	0.62	0.99	1.41	2.13	3.36	5.25	10.10
PE	23.33	17.14	5.75	9.58	12.96	18.11	27.53	42.38	94.95
Roe	13.63	7.68	2.05	4.81	7.97	12.42	17.64	23.92	37.58
Lev	30.24	30.14	0.00	0.30	6.18	21.76	45.06	72.67	130.33
R&D	0.99	2.95	0.00	0.00	0.00	0.00	0.00	3.08	14.84
Forecastg	19.07	16.36	-7.89	4.06	9.65	15.38	24.32	38.18	83.72
Indpb	1.92	0.44	1.17	1.42	1.62	1.84	2.11	2.49	3.25
Indpe	16.91	2.97	11.85	13.69	14.88	16.52	18.42	21.30	26.37
Judsys	9.16	1.61	2.50	6.75	9.00	10.00	10.00	10.00	10.00
Antidir	3.52	1.41	0.00	2.00	2.00	4.00	5.00	5.00	5.00
Acctstand	69.63	6.71	50.00	62.00	65.00	71.00	74.00	78.00	83.00
Imports/GDP	0.31	0.51	0.08	0.12	0.12	0.22	0.30	0.46	1.49
GDP/cap	23.36	9.54	0.67	4.91	19.19	26.63	29.46	33.30	40.95
GDPg	0.04	0.02	0.01	0.02	0.03	0.04	0.05	0.07	0.10
Inflation	3.54	6.34	-0.10	1.10	2.00	2.50	3.10	5.80	23.50
Beta	0.87	0.33	0.31	0.63	0.68	0.78	0.96	1.30	1.82
Ex_beta	0.06	0.41	-0.77	-0.45	-0.18	0.03	0.29	0.46	1.17
Corrupt	2.81	1.64	0.40	1.14	1.73	2.39	3.43	5.02	7.37

This table reports the means and various percentiles of the variables used in this study. These variables are described in detail in the appendix, briefly, they are: price-to-book ratio (PB), price-to-earning ratio (PE), return on equity (Roe), forecasted long-term growth (Forecastg), leverage (Lev), R&D-to-Net Sales (R&D), industrial harmonic mean of the price-to-book ratio (Indpb), industrial mean price-to-earnings (Indpe), efficiency of the judicial system (Judsys), anti-director rights (Antidir), accounting standards (Acctstand), annual imports-to-GDP (Imports/GDP), annual GDP per capita in dollars (GDP/cap), annual real GDP growth (GDPg), inflation, country-level stock return beta (Beta), country-level currency return beta (Ex_beta), and the Transparency-International Corruption Index (Corrupt). We include one observation per firm-year, sampled as of June 30th each year. Notice that certain variables (Corruption, Inflation, GDPg, GDP/cap, Imports/GDP, Acctstand, Antidir, Judsys) are common across firms in the same country, and others (Indpb and Indpe) are common for firms in the same industry. The sample period is from 6/1995 to 6/1998, inclusively.

Table 2: Firm-Level Correlations

	PB	PE	Roe	Lev	R&D	Forecastg	Indpb	Indpe
PB		0.47 ***	0.59 ***	-0.15 ***	0.17 ***	0.18 ***	0.35 ***	0.27 ***
PE	0.41 ***		-0.37 ***	-0.02 ***	0.13	0.26 ***	0.23 ***	0.30 ***
Roe	0.55 ***	-0.35 ***		-0.15	0.06 ***	-0.04 ***	0.16 ***	0.01
Lev	-0.13 ***	0.02 ***	-0.13 *		-0.05	0.01 ***	-0.14 ***	-0.06 ***
R&D	0.20 ***	0.16 0.00	0.05 ***	-0.13 0.00		0.11	0.29 ***	0.22
Forecastg	0.13 ***	0.23 ***	-0.06 *	0.04 ***	0.15 ***		0.19 ***	0.17 ***
Indpb	0.35 ***	0.22 ***	0.15 ***	-0.15 ***	0.31 ***	0.14 ***		0.75 ***
Indpe	0.29 ***	0.28 ***	0.02	-0.06 ***	0.24	0.14 ***	0.77 ***	

This table reports the average pair-wise correlation (Pearson\Spearman) for firm-level and industry-level characteristics. The upper triangles reflect the Spearman correlation estimates; the lower triangles reflect the Pearson correlation coefficients. We compute the correlation table annually and report the time-series mean of the annual correlations. The asterisks represent the p-value of the correlation if the result is true in all four sample years. (*** - p-value < |0.005|, ** - p-value < |0.025|, * - p-value < |0.05|)

Table 3: Country-Level Correlations

	Judsys	Antidir	Acctstand	Imports/ GDP	GDP/cap	GDPg	Inflation	Beta	Ex_beta	Corrupt
Judsys		0.16 0.3155	**0.61** **0.0001**	0.20 0.2028	**0.79** **<0.0001**	-0.11 0.4811	**-0.60** **<0.0001**	0.06 0.7117	-0.11 0.4791	**-0.84** **<0.0001**
Antidir	0.13 0.4081		**0.47** **0.0026**	0.04 0.8221	-0.01 0.9672	0.38 0.0146	-0.08 0.6072	0.26 0.0979	0.31 0.0508	-0.24 0.1386
Acctstand	**0.57** **0.0002**	0.35 0.0295		0.31 0.0548	0.46 0.0035	0.07 0.6845	**-0.52** **0.0007**	0.39 0.0147	-0.11 0.5065	**-0.63** **<0.0001**
Imports/GDP	0.14 0.3744	0.09 0.5721	0.32 0.0488		0.19 0.1942	0.16 0.2867	-0.19 0.2183	0.13 0.4026	-0.18 0.2492	-0.33 0.0259
GDP/cap	**0.79** **<0.0001**	0.00 0.9946	**0.50** **0.0016**	0.10 0.5175		**-0.43** **0.0028**	**-0.82** **<0.0001**	0.12 0.4251	-0.13 0.4156	**-0.83** **<0.0001**
GDPg	-0.15 0.3577	0.28 0.0765	0.02 0.9258	0.34 0.0215	**-0.39** **0.0079**		0.23 0.1201	0.03 0.8669	0.24 0.1194	0.18 0.2443
Inflation	-0.39 0.0108	-0.24 0.1391	**-0.42** **0.0084**	-0.10 0.4945	**-0.42** **0.0039**	-0.02 0.8736		-0.19 0.2250	0.07 0.6484	**0.73** **<0.0001**
Beta	0.04 0.8157	0.23 0.1523	0.31 0.0615	0.06 0.7050	0.05 0.7391	-0.12 0.4567	-0.23 0.1283		0.31 0.0411	-0.14 0.3499
Ex_beta	-0.13 0.4224	0.30 0.0556	-0.12 0.4564	0.04 0.8149	-0.08 0.5867	0.16 0.3080	0.04 0.7987	0.31 0.0406		0.06 0.6912
Corrupt	**-0.84** **<0.0001**	-0.25 0.1223	**-0.60** **0.0001**	-0.22 0.1469	**-0.81** **<0.0001**	0.19 0.2127	**0.43** **0.0025**	-0.13 0.4073	0.03 0.8526	

This table reports the average pair-wise correlation (Pearson\Spearman) for country-level variables. The upper triangles reflect the Spearman correlation estimates; the lower triangles reflect the Pearson correlation coefficients. We compute the means of the variables across different years, with one observation per country, and calculate the correlation table of the means. The average p-value of these correlations is also reported.

Table 4: Random-Effect Regressions

	Panel A: Price-to-Book			*Panel B: Price-to-Earnings*	
	Model 1	Model 2		Model 3	Model 4
Intercept	-1.305 (-15.54)	-1.388 (-15.61)	Intercept	-0.414 (-0.38)	-1.615 (-1.40)
Roe	0.137 (90.62)	0.138 (90.60)	Roe		
Lev	-0.00149 (-4.05)	-0.00158 (-4.28)	Lev	0.0140 (3.73)	0.0130 (3.48)
R&D	0.0479 (12.29)	0.0475 (12.21)	R&D	0.336 (8.53)	0.333 (8.47)
Forecastg	0.0153 (22.35)	0.0158 (22.78)	Forecastg	0.232 (33.20)	0.236 (33.66)
Indpb	0.931 (34.68)	0.926 (34.49)	Indpe	1.262 (31.61)	1.255 (31.46)
GDPg		2.487 (2.77)	GDPg		42.864 (4.27)
Inflation		-0.0131 (-4.45)	Inflation		-0.209 (-5.54)
Corrupt	-0.0594 (-4.22)	-0.0394 (-2.54)	Corrupt	-1.221 (-6.67)	-0.904 (-4.44)
Year dummies chi2(3) P-value	 96.60 <0.0001	 91.36 <0.0001	Year dummies chi2(3) P-value	 42.92 <0.0001	 52.60 <0.0001
Overall R-sq	0.3978	0.4013	Overall R-sq	0.1035	0.1156
Hausman chi2(9) p-value	 52.16 <0.0001	 38.94 0.01	Hausman chi2(11) p-value	 128.83 <0.0001	 69.69 <0.0001
Observations	19,979	19,979	Observations	19,979	19,979

This following regression with random country effect is estimated using data as of June each year:

$$V_{i,t} = a_t + \sum_{j=1}^{n} d_{j,t} C_{j,i,t} + m_{i,t}$$

where V_{it} is PB_{it} in panel A and PE_{it} in panel B. PB_{it} (PE_{it}) is the year t price-to-book ratio (price-to-earning ratio) for firm i, and $C_{j,i,t}$ is the j^{th} characteristic of firm i in year t. The n firm-characteristics are: return on equity (ROE), leverage (Lev), R&D-to-Net Sales (R&D), forecasted long-term growth (Forecastg), and the industrial harmonic means of the price-to-book ratio and price-to-earning ratio (Indpb and Indpe). Country-level variables include Inflation, real GDP growth (GDPg) and Corruption. The sample is from 6/1995 to 6/1998, inclusive.

Table 5: Fixed-Effect Regression of PB and PE Ratios on Various Explanatory Variables

	Panel A: Price-to-Book						*Panel B: Price-to-Earnings*				
	Model 1	Model 2	Model 3	Model 4	Model 5		Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-1.242 (-22.50)	-3.041 (-3.53)	-1.716 (-1.92)	-0.885 (-0.90)	-1.735 (-1.15)	Intercept	-4.512 (-6.57)	-22.226 (-2.51)	0.174 (0.02)	35.309 (3.51)	-3.203 (-0.21)
Roe	0.132 (91.53)	0.138 (90.39)	0.138 (90.44)	0.138 (90.41)	0.138 (90.44)						
Lev	-0.002 (-4.55)	-0.002 (-4.14)	-0.002 (-4.13)	-0.002 (-4.16)	-0.002 (-4.19)	Lev	0.023 (6.09)	0.013 (3.51)	0.013 (3.55)	0.013 (3.53)	0.013 (3.50)
R&D	0.057 (14.68)	0.047 (12.15)	0.047 (12.13)	0.047 (12.16)	0.047 (12.19)	R&D	0.463 (11.46)	0.331 (8.41)	0.329 (8.38)	0.330 (8.40)	0.333 (8.50)
Forecastg	0.014 (20.75)	0.016 (22.68)	0.016 (22.78)	0.016 (22.80)	0.016 (22.79)	Forecastg	0.191 (26.91)	0.235 (33.42)	0.236 (33.64)	0.236 (33.66)	0.236 (33.68)
Indpb	0.988 (37.21)	0.925 (34.46)	0.926 (34.51)	0.925 (34.49)	0.924 (34.45)	Indpe	1.362 (34.24)	1.259 (31.53)	1.263 (31.70)	1.262 (31.68)	1.254 (31.54)
GDPg				3.859 (3.43)	2.825 (2.46)	GDPg				44.370 (3.86)	27.577 (2.35)
Inflation				-0.00244 (-0.25)	-0.000816 (-0.09)	Inflation				-0.404 (-4.14)	-0.357 (-3.65)
GDP/cap					0.0000282 (3.19)	GDP/cap					0.000748 (8.28)
Imports/GDP					1.882 (3.57)	Imports/GDP					16.636 (3.09)
Corrupt			-0.220 (-5.78)	-0.198 (-5.04)	-0.173 (-4.23)	Corrupt			-3.723 (-9.58)	-3.148 (-7.86)	-2.247 (-5.37)
Year (F-stat) P-value		67.19 <0.0001	71.76 <0.0001	66.93 <0.0001	27.16 <0.0001	Year (F-stat) P-value		14.61 <0.0001	16.03 <0.0001	17.75 <0.0001	4.43 0.0041
Country (F-stat) P-value		20.21 <0.0001	20.98 <0.0001	17.83 <0.0001	15.5 <0.0001	Country (F-stat) P-value		48.58 <0.0001	50.2 <0.0001	41.09 <0.0001	28.45 <0.0001
Adj R-sq	0.3945	0.4252	0.4262	0.4265	0.427	Adj R-sq	0.1204	0.2083	0.2118	0.2131	0.2158
Observations	19,979	19,979	19,979	19,979	19,979	Observations	19,979	19,979	19,979	19,979	19,979

Table 5 (Continued)

This table reports the results of a pooled time-series cross-sectional regression based on information available as of June each year:

$$V_{i,t} = a_t + \sum_{j=1}^{n} d_{j,t} C_{j,i,t} + m_{i,t}$$

where V_{it} is PB_{it} in panel A and PE_{it} in panel B. The dependent variable PB_{it} (PE_{it}) is the year t price-to-book ratio (price-to-earning ratio) for firm i in year t. The independent variable $C_{j,i,t}$ is the j^{th} characteristic of firm i in year t.

The explanatory variables (firm, industry, and country characteristics) that we used are described in detail in Appendix B. In brief, they include: return on equity (Roe), leverage (Lev), R&D-to-Net-Sales (R&D), forecasted earnings growth rate (Forecastg), the harmonic mean of the industrial price-to-book ratio (Indpb), the harmonic mean of the industrial price-to-earning ratio (Indpe), and corruption (Corrupt). Other control variables in the regression include GDP per capita (GDP/cap), Imports/GDP ratio (Imports/GDP), real GDP growth (GDPg), and inflation. Certain variables (Corrupt, GDP per capita, Imports/GDP ratio, real GDP growth, and Inflation) are common across firms in the same country, while other variables (Indpb and Indpe) are common across firms in the same industry. T-statistics of the coefficients are given in brackets below the estimates. Most models also include indicator variables for each country and year. F-statistics for the year and country dummies are reported, with corresponding p-values below them. The sample is from 6/1995 to 6/1998.

Table 6: Corporate Control, Shareholder Rights, and Instrumental Variable Estimations

	Panel A: Price-to-Book					*Panel B: Price-to-Earnings*			
	Model 1	Model 2	Model 3 (IV)	Model 4 (IV)		Model 1	Model 2	Model 3 (IV)	Model 4 (IV)
Intercept	3.923 (0.00)	11.031 (0.00)	0.241 (0.22)	18.205 (5.40)	Intercept	67.743 (0.00)	131.191 (0.00)	56.849 (4.91)	234.396 (8.95)
Roe	0.139 (88.87)	0.139 (89.04)	0.138 (90.25)	0.139 (86.06)					
Lev	-0.00157 (-4.13)	-0.00159 (-4.22)	-0.00152 (-4.09)	-0.00162 (-4.14)	Lev	0.0130 (3.40)	0.0127 (3.33)	0.0136 (3.58)	0.0132 (3.30)
R&D	0.0467 (11.92)	0.0470 (12.01)	0.0471 (12.08)	0.0465 (11.49)	R&D	0.326 (8.23)	0.329 (8.35)	0.324 (8.13)	0.321 (7.81)
Forecastg	0.016 (22.62)	0.016 (22.51)	0.016 (22.84)	0.016 (22.23)	Forecastg	0.240 (33.34)	0.239 (33.34)	0.239 (33.48)	0.242 (32.32)
Indpb	0.922 (33.76)	0.920 (33.75)	0.927 (34.49)	0.914 (32.41)	Indpe	1.259 (31.07)	1.250 (31.00)	1.273 (31.48)	1.254 (29.77)
GDPg				-2.699 (-1.64)	GDPg				-23.509 (-1.45)
Inflation				0.0435 (3.17)	Inflation				0.0700 (0.50)
GDP/cap		0.000128 (8.98)			GDP/cap		0.00207 (14.29)		
Imports/GDP		6.375 (7.25)			Imports/GDP		61.161 (6.84)		
Corrupt	-0.297 (-6.68)	-0.123 (-2.46)	-0.520 (-4.41)	-1.860 (-12.16)	Corrupt	-4.443 (-9.78)	-1.324 (-2.59)	-13.142 (-10.76)	-22.216 (-16.87)
Judsys*Yr P-value	7.08 <0.0001	9.48 <0.0001		38.97 <0.0001	Judsys*Yr P-value	6.28 <0.0001	4.16 0.0023		71.19 <0.0001
Antidir*Yr P-value	2.41 0.065	19.47 <0.0001		49.32 <0.0001	Antidir*Yr P-value	0.46 0.7095	27.58 <0.0001		52.9 <0.0001
Acctstand*Yr P-value	0.000 0.9999	0.000 0.9998		27.54 <0.0001	Acctstand*Yr P-value	0.000 0.9999	0.000 0.9998		30.73 <0.0001
Year (F-stat) P-value	2.98 0.0301	3.73 0.0108	73.51 <0.0001	21.69 <0.0001	Year (F-stat) P-value	2.12 0.0958	6.03 0.0004	21.16 <0.0001	25.95 <0.0001
Country (F-stat) P-value	20.64 <0.0001	22.43 <0.0001	20.59 <0.0001	21.6 <0.0001	Country (F-stat)	48.24 <0.0001	42.65 <0.0001	49.07 <0.0001	39.49 <0.0001
Adj R-sq	0.4262	0.4292	0.4244	0.3896	Adj R-sq	0.2118	0.2203	0.1886	0.1488
First-stage Adj R-sq			0.9743	0.9801	First-stage Adj R-sq			0.9743	0.9801
Observations	19,289	19,289	19,979	19,289	Observations	19,289	19,289	19,979	19,289

Table 6 (Continued)

This table reports the results of a pooled time-series cross-sectional regression based on information available as of June each year:

$$V_{i,t} = a_t + \sum_{j=1}^{n} d_{j,t} C_{j,i,t} + m_{i,t}$$

where V_{it} is PB_{it} in panel A and PE_{it} in panel B. The dependent variable PB_{it} (PE_{it}) is the year t price-to-book ratio (price-to-earning ratio) for firm i in year t. The independent variable $C_{j,i,t}$ is the j^{th} characteristic of firm i in year t.

The explanatory variables (firm, industry, and country characteristics) that we used are described in detail in Appendix B. In brief, they include: return on equity (Roe), leverage (Lev), R&D-to-Net-Sales (R&D), forecasted earnings growth rate (Forecastg), the harmonic mean of the industrial price-to-book ratio (Indpb), the harmonic mean of the industrial price-to-earning ratio (Indpe), and corruption (Corrupt). Other control variables in the regression include GDP per capita (GDP/cap), Imports/GDP ratio (Imports/GDP), real GDP growth (GDPg), and inflation. Certain variables (Corruption, GDP per capita, Imports/GDP, real GDP growth, and Inflation) are common across firms in the same country, while other variables (Indpb and Indpe) are common across firms in the same industry.

T-statistics of the coefficients are given in brackets below the estimates. All models include indicator variables for each country and year. F-statistics for the year and country dummies are reported, with corresponding p-values below them. Some models also include the interaction variables created by multiplying the year dummies with the following three corporate control and shareholder rights variables: judicial efficiency (Judsys), accounting standard (Acctstand), and anti-director's rights (Antidir). The F-statistics and P-values for these variables are reported.

Models 3 and 4 in both panels are two-stage least squared (2SLS) regressions where GDP/cap and Imports/GDP ratio are used as instrumental variables for Corrupt. For these estimations, we report the first stage adjusted r-square, as well as the estimated coefficients and test-statistics from the second-stage. The number of observations is reported for each model. The sample period is from 6/1995 to 6/1998, inclusive.

Table 7: Fixed-Effect Models with Country-level Market and Currency Betas

	Panel A: Price-to-Book					*Panel B: Price-to-Earnings*			
	Model 1	Model 2	Model 3	Model 4 (IV)		Model 1	Model 2	Model 3	Model 4 (IV)
Intercept	-1.716 (-1.92)	-1.047 (-1.29)	-1.241 (-1.20)	-0.588 (-0.58)	Intercept	0.174 (0.02)	10.460 (1.27)	38.494 (3.64)	62.721 (5.85)
Roe	0.138 (90.44)	0.138 (90.13)	0.138 (90.08)	0.138 (89.88)					
Lev	-0.00153 (-4.13)	-0.00156 (-4.21)	-0.00158 (-4.24)	-0.00157 (-4.21)	Lev	0.0133 (3.55)	0.0124 (3.30)	0.0123 (3.29)	0.0126 (3.31)
R&D	0.0472 (12.13)	0.0468 (12.02)	0.0469 (12.04)	0.0468 (11.99)	R&D	0.3293 (8.38)	0.3286 (8.36)	0.3288 (8.37)	0.3241 (8.13)
Forecastg	0.0158 (22.78)	0.0159 (22.81)	0.0159 (22.84)	0.0161 (22.91)	Forecastg	0.236 (33.64)	0.237 (33.53)	0.237 (33.56)	0.240 (33.45)
Indpb	0.926 (34.51)	0.931 (34.52)	0.931 (34.52)	0.931 (34.47)	Indpe	1.263 (31.70)	1.260 (31.52)	1.260 (31.52)	1.267 (31.26)
Beta		0.070 (1.02)	0.041 (0.59)	-0.055 (-0.70)	Beta		3.338 (4.75)	3.352 (4.72)	0.439 (0.50)
Ex_beta		-0.188 (-3.73)	-0.201 (-3.98)	-0.113 (-1.84)	Ex_beta		-1.120 (-2.18)	-1.411 (-2.73)	1.257 (1.89)
GDPg			4.348 (3.75)	3.077 (2.44)	GDPg			36.042 (3.05)	0.000 (0.71)
Inflation			-0.00288 (-0.27)	0.0132 (1.07)	Inflation			-0.525 (-4.84)	-0.0469 (-0.35)
Corrupt	-0.220 (-5.78)	-0.189 (-4.80)	-0.164 (-4.03)	-0.507 (-3.63)	Corrupt	-3.723 (-9.58)	-3.326 (-8.26)	-2.738 (-6.61)	-12.699 (-8.98)
Year (F-stat)	71.76 <0.0001	65.94 <0.0001	62.53 <0.0001	62.88 <0.0001	Year (F-stat)	16.03 <0.0001	16.89 <0.0001	18.76 <0.0001	19.22 <0.0001
Country (F-stat)	20.98 <0.0001	20.94 <0.0001	17.89 <0.0001	17.58 <0.0001	Country (F-stat)	50.2 <0.0001	49.16 <0.0001	40.58 <0.0001	35.32 <0.0001
Adj R-sq	0.4262	0.4257	0.4261	0.424	Adj R-sq	0.2118	0.2121	0.2135	0.1905
First-stage Adj R-sq				0.9762					0.9761
Observations	19,979	19,829	19,829	19,829	Observations	19,979	19,829	19,829	19,829

Table 7 (Continued)

Table 7 reports the results of a pooled time-series cross-sectional regression based on information available as of June each year:

$$V_{i,t} = a_t + \sum_{j=1}^{n} d_{j,t} C_{j,i,t} + m_{i,t}$$

where V_{it} is PB_{it} in panel A and PE_{it} in panel B. The dependent variable PB_{it} (PE_{it}) is the year t price-to-book ratio (price-to-earning ratio) for firm i in year t. The independent variable $C_{j,i,t}$ is the j^{th} characteristic of firm i in year t.

The explanatory variables (firm, industry, and country characteristics) that we used are described in detail in Appendix B. In brief, they include: return on equity (Roe), leverage (Lev), R&D-to-Net-Sales (R&D), forecasted earnings growth rate (Forecastg), the harmonic mean of the industrial price-to-book ratio (Indpb), the harmonic mean of the industrial price-to-earning ratio (Indpe), and corruption (Corrupt). Other control variables in the regression include country beta (Beta), exchange rate beta (Ex_beta), (see the following description), real GDP growth (GDPg), and inflation. Certain variables (Corruption, GDP per capita, Import/GDP ratio, real GDP growth, Inflation, Ex_Beta, and Beta) are common across firms in the same country, while other variables (Indpb and Indpe) are common across firms in the same industry. T-statistics of the coefficients are given in brackets below the estimates. Most models also include indicator variables for each country and year. F-statistics for the year and country dummies are reported, with corresponding p-values below them. The sample is from 6/1995 to 6/1998.

Country beta (Beta) refers to the beta of the country stock index relative to the MSCI world stock index. Exchange rate beta (Ex_beta) refers to the beta of the country stock index relative to an exchange rate index of the US dollar. To compute Beta and Ex_beta, we use the two-factor model:

$$r_{i,t} - r_f = a + b\,(r_{m,t} - r_f) + b^{e}\Delta e + m_{i,t}$$

The dependent variable is the monthly dollar return on the stock market index where the firm is located. The two factors on the right hand side of the regression are (i) the market factor ($r_m - r_f$), which is the excess dollar return of the value-weighted MSCI world market portfolio, and (ii) the currency factor which is the return on the US dollar vis-à-vis the other six countries in the G7 (weighted by the relative stock-market capitalization). An increase in the index implies US dollar depreciates against the basket of currencies. The rolling 60-month return of the indices are used, and the regression coefficients are the Beta and the Ex_beta.

Models 4 in both panels are two-stage least squared (2SLS) regressions where GDP/cap and Imports/GDP ratio are used as instrumental variables for Corrupt. For these estimations, we report the first stage adjusted r-square, as well as the estimated coefficients and test-statistics from the second-stage. The number of observations is reported for each model. The sample period is from 6/1995 to 6/1998, inclusive.

Table 8: The Differential Effect of Current ROE, R&D Expense, and Forecasted Growth in High and Low Corruption Countries

	Panel A: Price-to-Book					*Panel B: Price-to-Earnings*			
	Model 1	Model 2	Model 3	Model 4		Model 1	Model 2	Model 3	Model 4
Intercept	-2.571 (-2.97)	-1.599 (-1.57)	-2.989 (-3.46)	-1.979 (-1.94)	Intercept	-19.326 (-2.18)	29.175 (2.80)	-21.895 (-2.48)	25.718 (2.47)
Roe	0.140 (88.64)	0.140 (88.31)	0.137 (49.03)	0.138 (48.84)					
Lev	-0.00159 (-4.28)	-0.00163 (-4.38)	-0.00155 (-4.19)	-0.00160 (-4.30)	Lev	0.0131 (0.004)	0.0122 (3.25)	0.0136 (3.60)	0.0126 (3.36)
R&D	0.0466 (11.96)	0.0463 (11.88)	0.0453 (11.43)	0.0452 (11.36)	R&D	0.324 (0.04)	0.323 (8.20)	0.340 (8.46)	0.339 (8.44)
Forecastg	0.0166 (22.63)	0.0167 (22.64)	0.0143 (13.11)	0.0146 (13.25)	Forecastg	0.246 (0.01)	0.247 (33.20)	0.226 (20.39)	0.227 (20.29)
Indpb	0.920 (34.26)	0.926 (34.31)	0.925 (34.38)	0.930 (34.43)	Indpe	1.253 (0.04)	1.252 (31.30)	1.256 (31.38)	1.254 (31.30)
GDPg		4.978 (4.33)		4.935 (4.29)	GDPg		45.075 (3.84)		46.054 (3.92)
Inflation		-0.0103 (-0.99)		-0.0108 (-1.04)	Inflation		-0.672 (-6.28)		-0.655 (-6.13)
Beta		0.0906 (1.32)		0.0871 (1.27)	Beta		4.142 (5.91)		4.122 (5.88)
Ex_beta		-0.240 (-4.85)		-0.243 (-4.92)	Ex_beta		-2.080 (-4.12)		-2.117 (-4.19)
CorrHi*ROE	-0.0301 (-5.21)	-0.0291 (-4.97)							
CorrHi* R&D	0.000 (-0.70)	0.000 (-0.84)			CorrHi* R&D	0.000 (0.00)	0.000 (-0.58)		
CorrHi* Forecastg	-0.00761 (-3.34)	-0.00726 (-3.16)			CorrHi* Forecastg	-0.107 (0.02)	-0.110 (-4.70)		
CorrLo*ROE			0.000860 (0.26)	-0.000383 (-0.11)					
CorrLo* R&D			0.000131 (1.83)	0.000132 (1.85)	CorrLo* RandD			-0.00125 (-1.71)	-0.00124 (-1.71)
CorrLo* Forecastg			0.00259 (1.85)	0.00226 (1.60)	CorrLo* Forecastg			0.0150 (1.06)	0.0142 (0.99)
Year (F-stat)	66.81 <0.0001	58.88 <0.0001	67.05 <0.0001	59.01 <0.0001	Year (F-stat)	14.42 <0.0001	21.36 <0.0001	14.53 <0.0001	21.65 <0.0001
Country (F-stat)	18.07 <0.0001	17.91 <0.0001	20.09 <0.0001	17.9 <0.0001	Country (F-stat)	46.46 <0.0001	43.91 <0.0001	47.56 <0.0001	40.1 <0.0001
Adj R-sq	0.4262	0.4265	0.4254	0.4257	Adj R-sq	0.209	0.2126	0.2083	0.2119
Observations	19,979	19,829	19,979	19,829	Observations	19,979	19,829	19,979	19,829

Table 8 (continued)

This table provides evidence on the differential effect of ROE, R&D, and Forecast Growth on PB and PE in high-corruption and low-corruption countries. To construct this table, we estimated the following pooled time-series cross-sectional regression using data publicly available as of June each year:

$$V_{i,t} = a_t + \sum_{j=1}^{n} d_{j,t} C_{j,i,t} + m_{i,t}$$

where V_{it} is PB_{it} in panel A and PE_{it} in panel B. PB_{it} (PE_{it}) is the year t price-to-book ratio (price-to-earning ratio) for firm i, and $C_{j,i,t}$ is the j^{th} characteristic of firm i in year t. The n firm-characteristics are: return on equity (ROE), leverage (Lev), R&D-to-Net Sales (R&D), forecasted long-term growth (Forecastg), the harmonic mean of the industrial price-to-book ratio (Indpb), and the harmonic mean of the industrial price-to-earning ratio (Indpe). Other control variables in the regression include country beta (Beta), exchange rate beta (Ex_beta), (see the following description), real GDP growth (GDPg), and inflation. Certain variables (real GDP growth, Inflation, Ex_Beta, and Beta) are common across firms in the same country, while other variables (Indpb and Indpe) are common across firms in the same industry.

HiCorr is an indicator variable that equals one in a country with high corruption (a score above 5.5 on average across years) and zero otherwise. LoCorr is the corresponding indicator variable for a country with low corruption (an average score below 2.5). HiCorr*ROE refers to the interaction variable formed by multiplying HiCorr with ROE. HiCorr*R&D and HiCorr*Forecastg are the interaction variables formed by multiplying HiCorr with R&D and Forecasted growth. Similarly, LoCorr is also multiplied by ROE, R&D and Forecastg to form the corresponding interaction variables.

The sample period is from 6/1995 to 6/1998. T-statistics of the coefficients are given in brackets below the estimates. Most models include indicator variables for each country and year. F-statistics for the year and country dummies are reported, with corresponding p-values below them.

Country beta (Beta) refers to the beta of the country stock index relative to the MSCI world stock index. Exchange rate beta (Ex_beta) refers to the beta of the country stock index relative to an exchange rate index of the US dollar. To compute Beta and Ex_beta, we use the two-factor model:

$$r_{i,t} - r_f = a + b\,(r_{m,t} - r_f) + b^{e}\Delta e + m_{i,t}$$

The dependent variable is the monthly dollar return on the stock market index where the firm is located. The two factors on the right hand side of the regression are (i) the market factor ($r_m - r_f$), which is the excess dollar return of the value-weighted MSCI world market portfolio, and (ii) the currency factor which is the return on the US dollar vis-à-vis the other six countries in the G7 (weighted by the relative stock-market capitalization). An increase in the index implies US dollar depreciates against the basket of currencies. The rolling 60-month return of the indices is used, and the regression coefficients are the Beta and the Ex_beta.

Table 9: Separate Regressions for Industrial and Developing Countries

	Panel A: Price-to-Book					*Panel B: Price-to-Earnings*			
	Industrial Countries		**Developing Countries**			**Industrial Countries**		**Developing Countries**	
	Model 1	Model 2	Model 1	Model 2		Model 1	Model 2	Model 1	Model 2
Intercept	-1.499 (-9.29)	-2.114 (-10.90)	-1.163 (-0.77)	-1.116 (-0.72)	Intercept	-1.761 (-1.05)	-10.796 (-5.39)	-0.910 (-0.06)	0.711 (0.04)
Roe	0.140 (83.50)	0.140 (83.50)	0.126 (35.38)	0.127 (34.73)					
Lev	-0.00187 (-4.55)	-0.00190 (-4.62)	-0.0000516 (-0.06)	-0.000320 (-0.37)	Lev	0.00783 (1.90)	0.00754 (1.83)	0.04190 (4.79)	0.03706 (4.17)
R&D	0.0457 (11.54)	0.0458 (11.59)	0.0658 (2.34)	0.0639 (2.23)	R&D	0.303 (7.62)	0.305 (7.69)	0.682 (2.32)	0.710 (2.38)
Forecastg	0.0166 (21.03)	0.0164 (20.89)	0.0130 (9.10)	0.0135 (9.18)	Forecastg	0.252 (31.80)	0.250 (31.62)	0.176 (11.85)	0.179 (11.72)
Indpb	0.930 (31.99)	0.929 (31.95)	0.803 (11.40)	0.830 (11.44)	Indpe	1.282 (29.90)	1.276 (29.80)	0.931 (8.73)	0.928 (8.51)
GDPg	-0.219 (-0.14)	1.588 (0.89)	3.568 (2.03)	7.351 (3.48)	GDPg	35.149 (2.23)	29.961 (1.65)	17.113 (0.93)	29.243 (1.33)
Inflation	-0.129 (-5.55)	-0.127 (-5.47)	-0.0200 (-1.78)	0.0105 (0.77)	Inflation	-1.911 (-8.11)	-1.874 (-7.96)	-0.414 (-3.51)	-0.283 (-1.98)
Beta		0.701 (6.19)		-0.395 (-3.80)	Beta		9.630 (8.39)		-2.025 (-1.87)
Ex_beta		-0.473 (-5.41)		0.140 (1.63)	Ex_beta		-3.977 (-4.49)		0.430 (0.48)
Corrupt	-0.212 (-4.35)	-0.075 (-1.40)	-0.007 (-0.09)	-0.018 (-0.23)	Corrupt	-3.491 (-7.06)	-2.149 (-3.96)	0.316 (0.40)	0.194 (0.23)
Year (F-stat)	81.92 <0.0001	62.83 <0.0001	7.53 0.0001	4.67 0.0029	Year (F-stat)	29.85 <0.0001	24.46 <0.0001	10.22 <0.0001	7.34 0.0001
Country (F-stat)	16.27 <0.0001	16.83 <0.0001	12.28 <0.0001	12.72 <0.0001	Country (F-stat)	35.56 <0.0001	35.35 <0.0001	9.12 <0.0001	8.7 <0.0001
Adj R-sq	0.4325	0.434	0.4171	0.4157	Adj R-sq	0.2285	0.2317	0.1666	0.1628
Observations	16,561	16,561	3,418	3,268	Observations	16,561	16,561	3,418	3,268

Table 9 (continued)

This following regression is estimated as of June each year:

$$V_{i,t} = a_t + \sum_{j=1}^{n} d_{j,t} C_{j,i,t} + m_{i,t}$$

where V_{it} is PB_{it} in panel A and PE_{it} in panel B. PB_{it} (PE_{it}) is the year t price-to-book ratio (price-to-earning ratio) for firm i, and $C_{j,i,t}$ is the j^{th} characteristic of firm i in year t.

The n firm-characteristics are: return on equity (ROE), leverage (Lev), R&D-to-Net Sales (R&D), forecasted long-term growth (Forecastg), the harmonic mean of the industrial price-to-book ratio (Indpb), the harmonic mean of the industrial price-to-earning ratio (Indpe), and corruption (Corrupt). Other control variables in the regression include country beta (Beta), exchange rate beta (Ex_beta), (see the following description), real GDP growth (GDPg), and inflation. Certain variables (Corruption, real GDP growth, Inflation, Ex_Beta, and Beta) are common across firms in the same country, while other variables (Indpb and Indpe) are common across firms in the same industry. The sample is from 6/1995 to 6/1998.

The first two columns in each panel report results of the regressions for industrial countries, defined by the World Bank's IFC classification in 1998. The last two columns in each panel report the results of the regressions for developing countries, defined by the World Bank's IFC.

Country beta (Beta) refers to the beta of the country stock index relative to the MSCI world stock index. Exchange rate beta (Ex_beta) refers to the beta of the country stock index relative to an exchange rate index of the US dollar. To compute Beta and Ex_beta, we use the two-factor model:

$$r_{i,t} - r_f = a + b\,(r_{m,t} - r_f) + b^{e}\Delta e + m_{i,t}$$

The dependent variable is the monthly dollar return on the stock market index where the firm is located. The two factors on the right hand side of the regression are (i) the market factor ($r_m - r_f$), which is the excess dollar return of the value-weighted MSCI world market portfolio, and (ii) the currency factor which is the return on the US dollar vis-à-vis the other six countries in the G7 (weighted by the relative stock-market capitalization). An increase in the index implies US dollar depreciates against the basket of currencies. The rolling 60-month return of the indices is used, and the regression coefficients are the Beta and the Ex_beta.

Table 10: Regressions Based on Top-100 Firms in Each Country

	Panel A: Price-to-Book				*Panel B: Price-to-Earnings*		
	Model 1	Model 2	Model 3		Model 1	Model 2	Model 3
Intercept	-2.621 (-2.64)	-3.167 (-3.0)	1.379 (2.31)	Intercept	12.944 (1.30)	13.564 (1.28)	24.043 (3.99)
Roe	0.136 (63.07)	0.137 (62.84)	0.138 (60.84)				
Lev	-0.00138 (-2.70)	-0.00146 (-2.84)	-0.00147 (-2.75)	Lev	0.0226 (4.42)	0.0207 (4.03)	0.0221 (4.14)
R&D	0.0639 (7.54)	0.0633 (7.44)	0.0622 (7.24)	R&D	0.0629 (0.74)	0.0626 (0.74)	0.0548 (0.64)
Forecastg	0.0154 (15.55)	0.0157 (15.74)	0.0158 (15.16)	Forecastg	0.2203 (22.26)	0.2226 (22.27)	0.2281 (21.89)
Indpb	0.836 (20.71)	0.849 (20.84)	0.828 (19.76)	Indpe	1.055 (17.62)	1.054 (17.50)	1.040 (16.75)
GDPg	5.188 (3.89)	4.139 (2.97)	1.114 (0.64)	GDPg	41.898 (3.12)	27.972 (2.00)	9.033 (0.52)
Inflation	0.0142 (1.46)	0.0209 (1.90)	0.0048 (0.38)	Inflation	-0.210 (-2.16)	-0.255 (-2.31)	-0.314 (-2.45)
Beta		-0.355 (-4.66)	-0.525 (-5.16)	Beta		-0.702 (-0.91)	-2.182 (-2.13)
Ex_beta		-0.318 (-5.44)	-0.230 (-3.56)	Ex_beta		-2.637 (-4.49)	-1.939 (-2.98)
Corrupt	-0.0824 (-1.91)	-0.0552 (-1.25)	-0.176 (-3.55)	Corrupt	-1.142 (-2.63)	-0.837 (-1.88)	-1.874 (-3.75)
Judsys*Yr P-value			8.27 <0.0001	Judsys*Yr P-value			5.77 0.0001
Antidir*Yr P-value			8.34 <0.0001	Antidir*Yr P-value			7.92 <0.0001
Acctstand*Yr P-value			2.77 0.0258	Acctstand*Yr P-value			2.22 0.0645
Year (F-stat)	50.2 <0.0001	35.99 <0.0001	5.77 0.0006	Year (F-stat)	9.25 <0.0001	7.82 <0.0001	3.78 0.01
Country (F-stat)	20.43 <0.0001	20.48 <0.0001	23.65 <0.0001	Country (F-stat)	30.77 <0.0001	31.95 <0.0001	35.02 <0.0001
Adj R-sq	0.4588	0.4611	0.467	Adj R-sq	0.2122	0.2131	0.2187
Observations	9,344	9,194	8,615	Observations	9,344	9,194	8,615

Table 10 (continued)

Table 10 reports the regression results for the subset of the sample where each country is limited to only the top 100 largest companies. The following pooled time-series cross-sectional regression is estimated using data publicly available as of June each year:

$$V_{i,t} = a_t + \sum_{j=1}^{n} d_{j,t} C_{j,i,t} + m_{i,t}$$

where V_{it} is PB_{it} in panel A and PE_{it} in panel B. PB_{it} (PE_{it}) is the year t price-to-book ratio (price-to-earning ratio) for firm i, and $C_{j,i,t}$ is the j^{th} characteristic of firm i in year t.

The n firm-characteristics are: return on equity (Roe), leverage (Lev), R&D-to-Net Sales (R&D), forecasted long-term growth (Forecastg), industrial harmonic mean of the price-to-book ratio (Indpb), industrial harmonic mean of the price-to-earning ratio (Indpe), and corruption (Corrupt). Other control variables in the regression include country beta (Beta), exchange rate beta (Ex_beta), (see the following description), real GDP growth (GDPg), and inflation.

Certain variables (Corruption, real GDP growth, Inflation, Ex_Beta, and Beta) are common across firms in the same country, while other variables (Indpb and Indpe) are common across firms in the same industry. The sample is from 6/1995 to 6/1998. T-statistics of the coefficients are given in brackets below the estimates. The models include indicator variables for each country and year. F-statistics for the year and country dummies are reported, with corresponding p-values below them.

Country beta (Beta) refers to the beta of the country stock index relative to the MSCI world stock index. Exchange rate beta (Ex_beta) refers to the beta of the country stock index relative to an exchange rate index of the US dollar. To compute Beta and Ex_beta, we use the two-factor model:

$$r_{i,t} - r_f = a + b\,(r_{m,t} - r_f) + b^{e}\Delta e + m_{i,t}$$

The dependent variable is the monthly dollar return on the stock market index where the firm is located. The two factors on the right hand side of the regression are (i) the market factor ($r_m - r_f$), which is the excess dollar return of the value-weighted MSCI world market portfolio, and (ii) the currency factor which is the return on the US dollar vis-à-vis the other six countries in the G7 (weighted by the relative stock-market capitalization). An increase in the index implies US dollar depreciates against the basket of currencies. The rolling 60-month return of the indices is used, and the regression coefficients are the Beta and the Ex_beta.

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