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Corruption and International Valuation: Does Virtue Pay?

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Abstract

Using firm-level data from 44 countries, we investigate the relation between corruption and international corporate values. Our analysis shows that firms from more corrupt countries trade at significantly lower market multiples. The effect is both economically and statistically significant. Furthermore, using a two-stage estimation procedure, we show that corruption impacts firm value primarily through lower expected future cash flows, most directly captured by firms' profitability forecasts. Collectively, our evidence shows corruption has significant economic consequences for shareholder value.

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1. Introduction

Corruption, defined as the *misuse of public office for private gain,* has emerged as a major issue in the global economy. As international markets become more integrated, interest in (and awareness of) the effects of corruption is on the rise.[1] 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]

While presumption of the damaging effects of corruption is widespread, direct evidence on its economic consequences has been relatively scarce. At a macro level, corruption has been linked to economic growth. The economic literature contains both theoretical and empirical evidence linking higher corruption with slower GDP growth.[4] At a micro level, however, little is known about the economic consequences of corruption on the value of individual firms.

In this study, we examine the empirical relation between the level of corruption within a country and the valuation of its corporations. Using firm-level data from 44 countries, we evaluate the extent to which corruption, as measured by Transparency International's Corruption Perception Index (CPI), is related to the market value of publicly traded firms.

Our analysis focuses on two specific questions: (a) Does corruption affect the value of the *average* firm, and (b) If the answer to the first question is affirmative, *how* does corruption affect valuation (i.e., through what specific channels)? Our research strategy is to exploit the increased power of firm-level analysis to

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[1] 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 Bank. On the efforts of the World Bank and IMF to combat corruption, see Rose-Ackerman (1997, page 93).

[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] For instance, in a multi-period endogenous growth model, Ehrlich and Lui (2001) demonstrate the negative impact corruption can have on long-term growth. In an empirical study, Mauro (1995) uses country-level data to show that corrupt countries have lower economic growth, even after controlling for many other factors. In the same spirit, Murphy, Shleifer and Vishny (1991) argue that corruption distorts the allocation of talent away from entrepreneurship and innovation, leading to lower economic growth. More generally, Krueger (1974) focuses on the efficiency losses that come from rent-seeking behavior.

examine this phenomenon, and apply valuation theory to explore the channels through which corruption might affect firm value.

We find that firms from more corrupt countries trade at significantly lower market multiples (both Price-to-book and Tobin's Q ratios).[5] Dividing countries into tertiles (high, medium, and low) by their corruption score, we find a difference of 37 basis-points (approximately 18%) in the average PB ratio between low and high corruption countries. Similarly, we find a difference of 25 basis-points (around 15%) in the average Tobin's Q between low and high corruption countries. Interestingly, the effect is asymmetric and largely driven by low valuations in highly corrupt countries. On average, a one standard-deviation decrease in the corruption index is associated with an 11 basis-point (approximately 5%) increase in the average price-to-book ratio. Similarly, a one standard-deviation drop in corruption results in an 8 basis-point (almost 5%) increase in the average Tobin's Q.

Further analyses using firm-level data show that the effect of corruption on valuation is robust to the inclusion of a variety of control variables, including: a firm's own historical profitability (ROE or ROA), profit margin, the level of R&D expense, and dividend payout. In addition, corruption continues to be negatively correlated with firm valuation even after including country level controls such as: Country Beta, Currency Beta, GDP growth, and Inflation. Cluster-corrected t-statistics, as well as bootstrapped results, indicate that these findings are statistically as well as economically significant.

To address the second question, we employ a two-stage estimation procedure. In the first-stage, we build forecasting models for three key drivers of firm value: future profitability (ROE), earnings growth (g) and expected returns (r). Specifically, we run regression of next-year's ROE, growth, and expected returns on past information set, including corruption. We call these fitted value ROE*, g*, and r*. These are the expected future profitability, growth, and returns. Next, we regress PB on both the corruption index (Corrupt) and ROE*, comparing these results to the case when PB is regressed on corruption alone. We follow a similar procedure for r* and g*. We also repeat these tests using Tobin's Q as the dependent variable, and ROA* rather than ROE* as an explanatory variable.

We find that corruption is no longer a significant explanatory variable once we include forecasted long term growth, expected profitability and expected returns. Specifically, we find this effect derives primarily through the inclusion of the forecasted profitability variable (either ROE* or ROA*). To a lesser extent,

[5] We define Tobin's Q in the traditional manner: that is, as the ratio of total enterprise value (market capitalization of equity plus debt) and book value of debt and equity.

forecasted long-term earnings growth (g*) also plays a role, while expected return (r*) does not. These results hold whether we use clustered standard errors, bootstrapped standard errors, or fixed effect. They are also robust if we limit the sample to only the 300 largest firms in each country (see Table 5).

In sum, our findings support the view that higher levels of corruption are associated with lower corporate values. Furthermore, we show that country-level corruption impacts firm value primarily through lower expected future cash flows, most directly captured by expected profitability (ROE* or ROA*). We conclude corruption has significant economic consequences for shareholder value.

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]

2.2 What gives rise to corruption?

Most studies that explore the determinants of corruption 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, p.77) observed: "[The] existence of corruption requires three elements to co-exist. First, someone must have

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

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."

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. He argues that these findings are broadly consistent with the theory on the expected costs and benefits of committing a corrupt act.[7]

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. These studies imply a link between corruption and agency costs within a country, but do not connect corruption with firm values.

[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.

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.

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 long-term 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.

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

In this study, we used ten annual issues (1994 through 2003) 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]

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).

3. Corruption and Firm Value

The dependent variables for our analysis are the price-to-book (PB) and the Tobin's Q ratios. In this section, we present the valuation theory that identifies the economic determinants of these ratios. We also discuss the link of corruption to shareholder value. Finally, we motivate the empirical constructs used to estimate our valuation model.

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]

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

[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. Kaufmann, Kraay, and Zoido-Lobaton (1999a, 1999b) criticize the Transparency International measure, and advocate an alternative estimation technique. However, their measure is not available for periods before 1997.

[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.

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) and its cost-of-capital (r). Firms that have higher expected ROE and lower r will trade at higher price-to-book ratios. In other words, the primary drivers of the P/B ratio should be its expected ROE and its cost of capital (r). A related construct that could also be relevant is a company's expected rate of long-term earnings growth (g). This growth term is implicit in the above model, but can be empirically estimated separately using I/B/E/S analyst earnings forecasts.[11]

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.[12] In an analogous process, it is straightforward to derive Tobin's Q ratio in terms of a firm's expected ROA, expected growth rates (g), and the cost of capital (r).

3.2 Corruption and Firm Value

As valuation theory illustrates, the price investors are willing to pay for a firm's book value (or net operating asset) is primarily driven by the firm's expected profitability (ROE, or in the case of the Tobin's Q, ROA), its cost of capital (r), and future growth rate (g). In this subsection we discuss means through which corruption can affect these economic drivers of firm value.

First, corruption reduces long-term economic growth. A substantial literature provides theoretical and empirical support for the view that higher corruption is associated with lower economic growth (Krueger (1977), Mauro (1998), Murphy et al. (1991), and Ehrlich and Lui (2001)).[13] Future long-term growth is, of course, one of the key drivers of corporate values. To the extent that corruption lowers expected long-term

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[11] In the residual-income model, a company's book value will grow at a rate equal to its return-on-equity times the expected plowback rate (i.e. ROE (1-k), where k is the dividend payout ratio). Therefore, a company's expected earnings growth rate (g) will be highly correlated with its future expected profitability measure (ROE).

[12] 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.

[13] Wei (1997) shows that corruption also lowers direct foreign investment.

growth (g), we would expect firms in more corrupt countries will trade at lower valuation multiples. Empirically we use the long-term expected earnings growth rate derived from I/B/E/S analyst forecasts to proxy for g.

Second, corruption can negatively impact firms' expected cash flows, as captured by firms' forecasted future profitability. As the residual income valuation model demonstrates, a firm's future profitability is the primary driver of its internal growth rate. In the absence of additional external financing, lower profitability leads directly to lower book value growth. Therefore, to the extent that firms operating in more corrupt regimes are expected to be relatively less profitable in the future, these firms will trade at lower valuation multiples.

The impact of corruption on expected profitability could derive directly, through "tunneling" activities in which controlling shareholders divert resources of the firm (e.g., Johnson et al. (2000), Jiang et al. (2005)), or indirectly, through a broad range of agency costs associated with managerial misconducts – e.g., perquisite consumption, empire building, or outright stealing at the expense of the shareholders (e.g. Stulz 1990, Jensen and Meckling 1974). In countries with healthy court systems, the legal actions offer investor protection from such abuse (La Porta et al. 1998). In more corrupt regimes, corporate insiders and block shareholders operate with much greater impunity.[14]

Third, it is possible that corruption can increase the required cost of capital (r). 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) and Albuquerque and Wang (2006a, b) show that firms from countries with better investor protection laws enjoy higher Tobin's Q.[15]

Not all literature are in favor of the idea that corruption is welfare reducing. An early stream of theoretical work suggests that corruption might serve to "grease the wheels of commerce," thus reducing transaction cost and lowering the cost of capital (e.g., see Leff (1964) and Lui (1985); Kaufman and Wei (1999) and

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[14] Johnson et al. (2000) and Jiang et al. (2005) contain good discussions of the tunneling phenomenon. More broadly, Shleifer and Vishny (1993) argue that corruption drives up price and lower the level and quality of government output and services, including those services that directly impact shareholder rights.

[15] Doidge, Karolyi and Stulz (2004) show that country characteristics can explain a large portion of firm-level corporate governance in those countries.

Aidt (2003) offer rebuttals). However, this efficiency-enhancing view of corruption has found little empirical support and has largely fallen out of favor (Aidt (2003)).

In short, prior studies suggest several channels through which corruption might affect firm values. While the weight of the evidence suggests corruption will negatively impact corporate values, an opposing view also exists. In the tests that follow, we evaluate the evidence on the association between corruption and equity valuation, and examine the specific channels through which such an association might manifest itself.

3.3 Sample Selection

Our initial sample of firms is derived from the Worldscope database. To complement the corruption index data from Transparency International, we focus our analysis on the time period from 1994 to 2003. To be included in the sample, we require 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 be included in the Transparency International CPI rankings. We include American Depository Receipts (ADRs), but all our results hold when the ADRs are excluded.

We obtained the total market capitalization for each firm based on closing market prices as of June 30th of each year. In addition, we require 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 expenditures, fiscal year-end date, and currency denomination.[16] We require each firm to have consensus earnings forecasts in the I/B/E/S International database as of the June statistical period for each year. We require that a sufficient number of firms from each country have earnings forecasts when we derive the country-level growth variable (see Appendix B for details).[17] In creating Future ROE, we use one-year-ahead ROE for the firms. We also require that a sufficient number of firms from each country have future ROE when we derive the country-level future ROE variable.

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

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[16] 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.

[17] In computing the country-level long-term growth rate, we require that at least 30% of the firms within a country have available data (i.e., some long-term earnings forecasts), and at least 30 firms per country.

price-to-book, price-earning, leverage, return-on-equity, and forecasted growth rates. After these filters, we obtained 58,766 firm-year observations.

3.4 Model Estimation

Our research design involves the use of regression models that attempt to explain cross-national variations in P/B and Tobin's Q ratios. For this purpose, we compute four firm-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:

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.

ROA – Return on asset. This variable is operating profit scaled by the end-of-period total asset. This variable measures the firm-level profitability regardless of the capital structure of the firm. We expect this profitability measure to be a key driver of cross-sectional variations in the Tobin's Q ratio. It is only used in the Tobin's Q regression.

Profit Margin – Net income before extraordinary items scaled by sales. To the extent that firms with higher current profit margins earn greater future accounting rates of return, we would expect profit margin to be positively correlated with current PB and Tobin's Q ratios.

R&D – Total research and development expenditures divided by sales. Firms with higher R&D expenditures tend to understate current earning relative to future earning. To the extent that this variable captures expected earnings growth beyond forecast earning growth, we expect it to be positively correlated with the PB and Tobin's Q ratios.

Dividend Payout – Dividend scaled by net income. Under Miller and Modigliani, financing activities (including the payment of dividends) should not affect firm value. However, in developing countries with imperfect capital markets, firms fund their own growth internally (e.g. Demirgüç-Kunt and Maksimovic (1998)). In such cases, high dividend payout could reduce growth in the future and may negatively affect valuation.

In addition to these firm-level variables, we create country-level variables. We first compute the Country ROE, Country ROA, Country R&D and Country PM as the average values of firm-ROE, ROA, R&D and Profit Margin, respectively, for that year. We also include five other country-level aggregate 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 in the previous year. To ensure these measures are available to the public as of June for each year, we use the prior year's numbers. We expect inflation to be negatively correlated with firm values (see, for example, Nissim and Penman, 2001). We expect real GDP growth to be positively correlated. However, as Easterly et al. (1993) and Hausmann et al. (2004) point out, real GDP growth is usually not sustainable over time. Hence, a previous year's real GDP growth may predict short-term GDP growth but not long-term GDP growth.

Growth – Forecasted country earnings growth based on I/B/E/S estimates. We first calculate each firm's long-term growth and then aggregate across firms within the country to compute growth. Each firm's long-term earning growth is computed as the arithmetic mean of the annual forecasted earning growth rate between year t+1 and year t+5. We then take the average of firm-level long-term growth rates in each country. Higher growth merit higher PB and Tobin's Q ratios.

Country ROE – Country aggregate equal-weighted average of firm ROE. We use next year's country ROE (i.e. Future ROE) in our first-stage regression to create the expected profitability. Higher expected ROE are associated with higher PB ratios.

Country ROA – Country aggregate equal-weighted average of firm ROA. We use next year's country ROA (i.e. Future ROA) in our first-stage regression to create the expected profitability. Higher expected ROA are associated with higher Tobin's Q ratios.

Country Returns – MSCI country-index local-currency rate of returns in percentages. We use next year's country returns (i.e. Future Returns) in our first-stage regression to create the expected returns. Higher expected returns are associated with lower PB and Tobin's Q ratios.

Log Credit Rating – Log of Country Credit Rating from *Institutional Investor* magazine. *Institutional Investor* ranks different countries' creditworthiness twice a year, in March and September. We use the March credit rating. Country credit ratings range from 0 to 100, with higher ratings representing better creditworthiness. Following Erb, Harvey and Viskanta (1996), we use the log of *Institutional Investor*'s country credit ratings as the measure. Higher log credit ratings are associated with lower PB and Tobin's Q ratios through higher expected returns.

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 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 as in Ferson and Harvey (1993):

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

The dependent variable is the monthly dollar rate of 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 rate of return of the value-weighted MSCI world market portfolio, and (ii) the currency factor (Δe), which is the rate of 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 that the US dollar has depreciated against the basket of currencies. The rolling 60-month index rate of return is used; Beta and Ex_beta are the estimated coefficients from this regression. Higher systematic risks imply higher expected returns and lower valuations.

4. Empirical Results

4.1 Descriptive Statistics

Table 1 provides summary statistics for several key variables used in our analyses. Panel A provides yearly means and the number of observations per year; Panel B reports similar statistics by country. All accounting variables are from the most recent fiscal year end. Market values are as of June 30th each year. The sample represents ten years, from 6/1994 to 6/2003. Note that the corruption variable (Corrupt) and the long-term growth forecast (Growth) are country-level measures, and are common across firms in the same country.

In Panel B, the countries are sorted in ascending order by its average corruption score. Transparency International releases its annual CPI result around July of each year. This measure ranges between 9 (highly corrupt) and 0 (highly clean). The countries are listed in rank order by their average corruption score over the ten annual surveys. The average corruption across countries is 3.9, while the standard deviation is 2.41. Also reported in this table is the average number of firms per year and the within-country standard deviation of valuation ratios. Over our sample period, Denmark, Finland, and New Zealand received the best corruption rankings while Venezuela, Pakistan, and Indonesia received the worst. The average number of firms per year ranged from 3 (Venezuela) to 1,905 (United States).

In the following two sections, we examine the two main questions in the paper: (a) what is the effect of corruption on the average firm? and (b) how (i.e., through what specific channels) does corruption affect firm valuation? Our results are structured to focus on these two points. Tables 2 and 3 address the first question, while tables 4 and 5 address the second question.

4.2 Effect of corruption on the average firm

Table 2 presents country-level evidence on the relation between corruption and firm valuation. Panel A reports the result of pooled regressions, in which the country mean PB and Tobin's Q ratios are regressed on each country's corruption index (Corrupt). Panel B reports the mean PB and Tobin's Q when countries are sorted annually into three equal-sized tertiles (low, mid, and high) on the basis of their corruption index. The number of observations for Panel B is the number of country-years in the sample. Panel C reports a comparison of the time-series average of each country's PB and Tobin's Q. To construct this panel, countries are first sorted into three equal-sized tertiles (low, mid, and high) on the basis of their average corruption indices over the years. Table values represent the mean value for the countries in each tertile.

Panel A shows that both country mean PB and Tobin's Q are higher for countries with lower corruption levels. The first regression shows that a unit increase in the corruption index corresponds to approximately a 0.047 decrease in the PB ratio. The second regression shows that a unit increase in the corruption index corresponds to approximately a decrease of 0.035 in the Tobin's Q ratio. On average, a one standard-deviation decrease in the corruption index is associated with an 11 basis-point (approximately 5%) increase in the average price-to-book ratio. Similarly, a one standard-deviation drop in corruption results in an 8 basis-point (almost 5%) increase in the average Tobin's Q.

Panel B again shows that more corrupt countries have lower country mean PB and Tobin's Q. Dividing countries into tertiles (high, mid, and low) by their corruption score, we find a significant difference in the average PB ratio between low and high corruption countries. Interestingly, the effect is asymmetric and largely driven by low valuations in highly corrupt countries.

In computing the values in Panel B, we implicitly assume that each country-year is an independent observation. In fact, individual countries' corruption levels evolve slowly over time, so test statistics could be inflated. In Panel C, we take the other extreme, and compute country-level averages of the PB and Tobin's Q ratios over time. We then sort these countries into three equal-sized tertiles (low, mid, and high) on the basis of their average corruption indices over the years.[18] This procedure results in having just one observation for each country.

[18] In a few cases, a country is not present for the entire 10-year sample period. As a result, the average valuation ratios across the three groups are slightly different from those reported in Panel B.

Panel C confirms the results in Panel B that more corrupt countries have lower country mean valuation ratios. On average, there is a difference of 37 basis-points (almost 18%) in the average PB ratio between low and high corruption countries. This difference is 25 basis-points (around 15%) for the average Tobin's Q ratios.

While country level analysis indicates that higher corruption is associated with lower stock valuation, there is limited power at the country level to discriminate between potential drivers of this result. In subsequent analyses, we use firm-level data to gain further insights on the association between corruption and valuation.

To set the stage, Table 3 reports the firm-level relation between corruption and firm valuation in the presence of a number of control variables. Specifically, we examine PB and Tobin's Q ratios using a pooled regression and with standard errors clustered by countries. For each ratio, we estimate five models. Model 1 illustrates the effect of the corruption variable. Model 2 introduces *firm-level* control variables that may affect valuations. Models 3 and 4 introduce *country-level* control variables. Model 5 contains all the control variables.

We acknowledge from the outset that the set of explanatory variables in Table 3 is somewhat ad hoc. Our main point is simply to show that the corruption effect is robust to the inclusion of a number of control variables. These results provide a base case, or benchmark, for our main analysis (presented in Tables 4 and 5), which features a two-stage DCF-based decomposition of the effect of corruption on valuation.

Model 1 shows that corruption is important in explaining the firm level PB ratios. Model 2 shows that corruption is still significant after controlling for: past ROE, profit margin, R&D, and the dividend payout ratio. As expected, PB is positively correlated with ROE, R&D, and negatively correlated with dividend payout. Somewhat surprisingly, firms with higher profit margins also receive lower PB multiples. This relation is likely due to the fact that ROE and profit margin are highly correlated. Model 3 shows that corruption is incrementally important after controlling for systematic risks of country and currency betas. Model 4 shows that the addition of GDPg and Inflation has little effect on the corruption variable. Finally, Model 5 shows that the impact of corruption is still significant after controlling for all the previous firm-level and macroeconomic factors.

Panel B repeat the same tests using Tobin's Q ratios as the dependent variable (and replacing ROE with ROA as an independent variable). We find that the corruption measure is negative and significant in all five models. Evidently firms from less corrupt countries earn higher Tobin's Q multiples, even after controlling for the other factors.

To calculate standard errors for the regressions in this paper, we adjust for country clusters using a technique developed by Huber-White and tested in financial settings in Petersen (2006). Petersen shows (using a large number of simulations) that the clustered standard error estimations are unbiased and more robust than either the fixed effect approach or Fama-MacBeth techniques. Consequently, we adjust the standard errors based on country clustering.[19] Firms within a country may be correlated through country clusters, and the independence assumptions in OLS no longer hold. This correlation of the residuals within a cluster is the problem that the clustered standard errors are designed to correct. In the clustered standard error method, the covariance between residuals within a cluster is estimated, and the correlation can be of any form; no parametric structure is assumed. The standard errors are consistent as the number of clusters grows.

To ensure that the standard error is robust, we also re-estimate all of the equations and compute standard errors using the bootstrap method. Specifically, to account for the correlation within country clusters, we draw bootstrap samples with replacement from country clusters, rather than individual firms. We then run the regression 100 times and use the variability in the slope coefficients as an estimate of the standard error. Our results are robust to all of these different specifications of standard errors. Collectively, these findings suggest that corruption is indeed associated with lower firm valuation. It also shows that the result is not due to model misspecification.

4.2 Channels through which corruption affects valuation

Table 4 investigates the channel through which corruption affects firm valuation. Specifically, Table 4 shows how corruption affects valuation through expected growth, expected profitability and expected returns. To construct this table, we first build forecasting models for expected growth, expected profitability, and expected returns as functions of some exogenous variables in the information set, including corruption. We call the fitted values g*, ROE* and r*. We then regress PB on corruption alone, and compare the results to a series of regressions of PB on corruption as well as on ROE*, r*, and g*. If

[19] In finance panel data sets, the residuals may be correlated across firms and time, and the OLS standard errors can be biased. After running many simulations, Petersen (2006) finds that clustered standard errors are unbiased and the most robust to different methods. While Petersen (2006) focuses on firm clusters, the problem in a country cluster is similar. Firms within a country are allowed to be correlated through country clusters, and the independence assumptions in OLS no longer hold. The clustered standard error is described in Wooldridge (2004). It was first attributed to Huber (1967), White (1980), Diggle et al. (1994) and Rogers (1993).

corruption impacts PB through its effect on expected profitability (ROE*), for example, then the addition of ROE* should eliminate the significance of corruption in explaining PB. The same applies to g* and r*.[20]

Appendix II shows the specifications and results from the first-stage regressions. In the first stage, long-term earning growth is regressed upon past GDP growth, inflation and R&D. One-year-ahead ROE is regressed upon current ROE and profit margin for the PB regression, while the one-year-ahead ROA is regressed upon current ROA and profit margin for the Tobin's Q regression. One-year-ahead country returns are regressed upon betas and currency betas and the log of institutional investors' country ratings, following Ferson and Harvey (1993) and Erb, Harvey and Viskanta (1996).[21] We call these fitted value expected growth (g*), expected ROE (ROE*), expected ROA (ROA*) and expected return (r*). Table 4 reports the second-stage model where PB and Tobin's Q are regressed upon expected growth, expected profitability and expected returns.

Table 4 presents the main evidence on the channels through which corruption affects growth. In this table, we examine PB and Tobin's Q ratios using a regression with country clustered standard errors. These three variables are from the first stage regressions as described above. Aside from corruption, the explanatory variables include expected earnings growth rate (g*), expected profitability (ROE* or ROA*) and expected returns (r*). For each dependent variable, we estimate five models. Model 1 is the benchmark estimation, which documents the explanatory power of corruption variables. Models 2, 3, and 4 illustrate the separate effects of growth, profitability and expected returns on the corruption variable. Model 5 examines the three effects together.

Panel A shows that corruption lowers PB ratios through the valuation drivers. Model 1 shows that corruption lowers valuation significantly. Model 2 shows that higher expected growth (g*) is associated with a significant increase in PB, as valuation theory predicts. However, corruption still significantly lowers PB after controlling for expected growth. This shows that expected growth is not the primary channel through which corruption affects valuation.

Model 3 shows that firms with higher expected profitability (ROE*) have higher PB, as expected. ROE* comes in with a positive coefficient and a t-statistic of 3.63. Importantly, after controlling for ROE*,

[20] Although we refer to this as a two-stage procedure, the two stages are actually run simultaneously to ensure the standard errors are calculated correctly.

[21] Ferson and Harvey (1993) find that a multi-beta model including a currency beta works well for industrial countries. Erb, Harvey, and Viskanta (1996) compare different models for predictability, including beta and volatility models and conclude that the country credit rating model works best when emerging markets are included.

corruption is no longer significant. This result demonstrates that corruption affects PB through expected profitability. Specifically, firms operating in more corrupt regimes have lower expected profitability (conditional on current profitability), and this lower future profitability is an important reason for the correlation between corruption and firm values.

Model 4 shows the results for expected return (r*). Introduction of the expected return variable also reduces the significance of the corruption variable. However, expected return does not come into the regression significantly. Once again, this result suggests that firms operating in more corrupt regimes Model 5 shows the results when all three value drivers are included. Corruption no longer lowers valuation after controlling for growth, profitability and expected returns, even though the three drivers are not individually significant.

Panel B shows that corruption also lowers Tobin's Q ratios through the valuation drivers, especially profitability. Model 1 shows that corruption lowers Tobin's Q significantly. Model 2 shows that higher expected growth (g*) is associated with a significant increase in Tobin's Q, but it only slightly reduces the statistical significance of corruption. Model 3 shows that firms with higher ROA* have higher valuation, as ROA* comes in significantly with a t-statistic of 6.59. Once again, corruption is no longer significant after controlling for ROA*. Model 4 shows that expected return (r*) does not come in significantly, although it does marginally reduce the significance of the corruption variable. Model 5 shows that corruption is no longer significantly correlated with firm valuation after controlling for all three forecasted value drivers.

Overall, Table 4 shows that expected profitability (ROE* or ROA*) is the major driver through which corruption lowers valuation, followed by a limited role played by expected growth (g*). We find no consistent evidence that corruption lowers valuation through expected returns (r*). In short, our evidence shows corruption impacts firm value primarily through lower expected future cash flows, most directly captured by firms' profitability forecasts.

One concern with our results is that they might be driven by a preponderance of firms from the US—which make up almost a third of the sample. To address this concern, we repeated the Table 4 analyses using a sample consisting of just the largest 300 firms from each country by market capitalization. The results, reported in Table 5, show that the key findings in Table 4 are essentially unchanged. Corruption affects valuation through the three value drivers and is no longer significant after controlling for the three control variables. Among the three, expected profitability is the most significant driver through which corruption lowers valuation. We also repeated these tests with the top 100 firms from each country. The t-statistics are lower but the findings are again qualitatively unchanged.

In sum, our results show that corruption leads to lower valuation mainly through lower future cash flows, most directly captured by forecasted profitability. We also find some, weaker, evidence that expected growth is a channel through which corruption affects valuation. As we discuss earlier, agency problems related to the managers (who are sometimes also the majority shareholders) may lead to lower expected cash flows, including forecasted growth and profitability on the firm level.

Our results are related to and consistent with papers in the international corporate finance literature. In an agency-based model, Albuquerque and Wang (2006a) predict that countries with weaker investor protection have greater incentives to over-invest, leading to lower Tobin's Q. In another recent study, Doidge, Karolyi and Stulz (2006) show that almost all the variation in governance ratings across firms in less developed countries is attributable to country characteristics rather than firm characteristics. To the extent that both highlight the importance of country-level characteristics, our findings are consistent with their results.

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, higher corruption is associated with lower long-term economic growth (Krueger (1977), Mauro (1998), Murphy et al. (1991), and Ehrlich and Lui (2001)). Second, corruption can reduce regulatory oversight against agency problems in firms, such as managerial perquisite consumption, stealing or empire building. Such agency problems lead to a decline in firm value through lower profitability (La Porta et al. (1998)). 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 PB and Tobin's Q multiples. Using firm-level data from 44 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.

On closer analyses, the effect of corruption does not appear to derive from lower expected returns (r*). Rather, consistent with our main proposition, corruption leads to a decline in firm value through lower cash flows, primarily captured by forecasted profitability (ROE* or ROA*). To a lesser extent, the lower valuation also seem attributable to lower growth (g*) for firms in more corrupt regimes.

The robustness of the corruption measure as an explanatory variable for international valuation, after controlling for many other variables, suggests to us that it captures something beyond public sector misconduct. Although our corruption measures relate to a public sector phenomenon, this behavior is likely to be mirrored in private sector dealings. To our knowledge, the extent to which corruption in the public sector reflects ethical problems in the private sector has not been studied. However, if these two forms of ethical behavior are correlated, it seems likely that both will affect agency costs within a country. We regard this as an interesting area for further research.

At 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 theory can be used to disentangle the channels through which corruption ultimately affect firm value.

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Appendix I: Descriptions of Firm and Country Specific Variables

Variables	Description	Calculation
Firm Level Variables:		
PB	Price-to-Book ratio	PB = Market value of equity/Total common equity.
Tobin's Q	Tobin's Q ratio	Tobin's Q = (market capitalization + total debt)/(book equity + total debt)
ROE	Return on Equity	ROE= Net Income before extraordinary items*100/Total common equity.
ROA	Return on Asset	ROA= Operating Profit*100/End-of-period total assets.
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.
Profit Margin	Profit Margin	Profit Margin = Net Income*100/Net Sales.
Dividend Payout	Dividend Payout	Dividend Payout = Dividend*100/Net Income
Country Level Variables:		
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.
Country Beta	Country stock beta	The 5-year rolling beta for returns on country stock indices vis-à-vis the MSCI world stock returns.
Currency 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.
Growth	Country aggregate forecasted long-term earnings growth rate (from I/B/E/S)	Country aggregate equal-weighted average of firm-level long-term growth rate. Firm-level long-term growth rate is computed as the arithmetic mean of the annual forecasted growth rate between year t+1 and year t+5. Each annual forecast growth rate from t+n to t+n+1 year is computed as (Forecasted earnings$_{t+n+1}$ – Forecasted earnings$_{t+n}$) *100/Forecasted earnings$_{t+n}$. If less than four years of forecasts is available, we use the mean of the available years.
Country ROE	Country aggregate ROE	Country aggregate equal-weighted average of firm ROE
Country ROA	Country aggregate ROA	Country aggregate equal-weighted average of firm ROA
Country R&D	Country aggregate Research & Development-to-Net Sales	Country aggregate equal-weighted average of firm R&D-to-net sales.
Country PM	Country aggregate profit margin	Country aggregate equal-weighted average of firm profit margin.
Country Returns	Country-level stock returns	MSCI country-index local-currency rate of returns in percentage
Log(Credit Rating)	Log of Country Credit Rating	Log of Country Credit Rating, from Institutional Investor magazine.
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.

Appendix II

First-stage Regression To Generate Expected Growth (g*), Expected Profitability (ROE*/ROA*) and Expected Returns (r*)

This table presents the first-stage regression to generate expected growth, expected profitability and expected returns. Specifically, we report the results of a pooled regression of the form:

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

where V_{it} are country aggregate IBES 1-5 year forecast earning growth (Growth), country aggregate of firms' one-year ahead ROE (Future ROE), country aggregate of firms' one-year ahead ROA (Future ROA) and one-year ahead MSCI country returns (Future return). The explanatory variables include Transparency International corruption perception index (Corrupt), real GDP growth (GDPg), annual percentage inflation rate (Inflation), country aggregate R&D-to-Net-Sales (Country R&D), Country ROE for the Price-to-book regressions or Country ROA for the Tobin's Q regressions, country aggregate profit margin (Country PM), Log(Credit Rating), Country Beta and Currency Beta. Appendix I contains details on how these variables are computed. These are the first-stage regressions to generate expected country earning growth rates (g*), expected country ROE (ROE*), expected country ROA (ROA*) and expected country returns (r*). The two stages of regressions are run simultaneously.

We report cluster-corrected t-statistics that adjust for country-level correlations using a Huber-White estimation procedure. All models include indicator variables for each year. The number of observations is reported for each model. The sample period is from 6/1994 to 6/2003, inclusive.

	Growth	Future ROE	Future ROA	Future Returns
Intercept	2.843	3.776	0.671	96.326
	(9.10)	(7.51)	(4.88)	(3.07)
Corrupt	0.011	-0.188	-0.004	-2.626
	(0.02)	(-2.33)	(-0.15)	(-3.04)
GDPg	0.133			
	(0.32)			
Inflation	0.481			
	(2.03)			
Country R&D	2.241			
	(6.83)			
Country ROE/ROA		0.718	0.888	
		(23.73)	(45.15)	
Country PM		0.006	-0.003	
		(2.23)	(-1.93)	
Log(Credit Rating)				-15.667
				(-2.17)
Country Beta				-10.719
				(-0.94)
Currency Beta				-0.152
				(-0.11)
Adj R-sq	0.0751	0.6848	0.8782	0.0337
Observations	56845	50499	50499	57137

Table 1
Summary Statistics of Estimation Variables

This table provides summary statistics for the key variables used in our analyses. Panel A provides yearly means and the number of observations per year; Panel B reports mean values by country. All accounting variables are from the most recent fiscal year end. Market values are as of June 30th each year. PB is the price to book ratio. Tobin's Q is defined as market capitalization plus total deb divided by book equity plus total debt. ROE is the net income before extraordinary income as a percentage of end-of-period book value of stockholders equity. ROA is operating profit scaled by end-of-period total assets, in percentage. Corrupt is the level of corruption for each country as reported annually by Transparency International. Growth is the long-term country earning growth forecast in percentage. For each firm, we compute the arithmetic mean of the annual forecasted growth rate between year t+1 and year t+5, as provided by IBES analysts (if less than four years of forecasts is available, we use the mean of the available years). The Growth variable is then computed as the average of firm-level long-term growth rates. In Panel B, the countries are sorted i ascending order by its average corruption score. We also report the within-country standard deviatio

Panel A: Descriptive Statistics by Yea

Year	PB	Tobin's Q	ROE	ROA	Corrupt	Growth	No of obs
1994	2.44	1.99	11.40	6.14	2.69	17.83	4417
1995	2.32	1.93	12.04	6.30	2.73	20.92	5135
1996	2.57	2.10	12.46	6.48	2.80	21.15	5792
1997	2.66	2.14	11.72	5.99	2.86	21.29	6683
1998	2.74	2.19	11.82	6.16	2.79	20.60	6709
1999	2.80	2.20	11.77	5.98	2.78	20.35	6539
2000	3.14	2.49	12.63	6.30	2.71	20.28	6285
2001	2.39	1.93	11.67	5.79	2.82	21.97	6207
2002	2.14	1.76	10.19	5.15	2.76	15.11	5663
2003	2.01	1.68	9.07	4.91	2.69	19.13	5336
Average	2.52	2.04	11.48	5.92	2.76	19.86	58766

Table 1 continued on next pag

Table 1 Panel B: Descriptive statistics by country

	Means						Std Dev		No of
	PB	**Tobin's Q**	**ROE**	**ROA**	**Corrupt**	**Growth**	**PB**	**Tobin's Q**	**firms/year**
Denmark	2.12	1.72	13.05	5.18	0.38	6.89	1.80	1.29	66
Finland	2.41	1.93	14.54	6.29	0.38	21.39	2.38	1.57	59
New_Zealand	2.18	1.80	13.33	6.73	0.59	13.10	1.77	1.16	39
Sweden	2.60	2.14	14.47	5.95	0.76	21.57	2.18	1.73	116
Singapore	2.10	1.84	12.02	6.22	0.91	16.04	1.65	1.33	86
Canada	2.44	2.00	10.62	4.61	0.99	25.32	1.77	1.39	135
Netherlands	2.77	2.08	16.79	5.80	1.09	17.73	2.49	1.68	107
Norway	2.08	1.75	12.45	4.14	1.16	14.60	1.57	1.24	56
Switzerland	2.43	1.89	10.41	4.62	1.29	17.33	2.16	1.54	89
Luxembourg	2.48	1.88	10.80	4.21	1.35	1.97	2.58	1.34	3
Australia	2.26	1.86	12.29	5.69	1.39	14.40	1.79	1.28	191
United_Kingdom	2.83	2.28	14.31	6.13	1.49	17.08	2.33	1.70	654
Germany	2.84	2.28	8.33	3.13	2.13	19.41	2.20	1.76	209
Ireland	2.54	1.82	15.94	5.63	2.18	13.04	1.98	1.19	29
Hong_Kong	1.89	1.69	16.18	8.56	2.36	18.10	1.55	1.25	115
United_States	2.88	2.32	11.99	7.89	2.36	23.79	2.12	1.69	1905
Austria	2.12	1.69	10.61	3.44	2.45	16.90	1.48	1.05	44
Israel	1.84	1.51	9.05	3.17	2.80	7.28	1.26	0.73	14
Chile	2.24	1.84	13.65	7.20	3.15	20.81	1.17	0.94	42
France	2.66	2.08	11.15	4.34	3.23	20.57	2.24	1.62	265
Japan	2.10	1.65	5.01	2.49	3.34	18.69	1.70	1.18	725
Portugal	2.29	1.61	11.91	3.28	3.62	18.76	1.77	1.03	27
Belgium	2.53	1.91	11.27	5.06	3.64	16.56	2.13	1.41	59
Spain	2.23	1.78	12.24	4.66	3.88	2.19	1.69	1.28	88
Taiwan	2.56	2.19	11.17	6.45	4.57	14.89	1.87	1.54	152
South_Africa	2.55	2.24	19.12	9.12	4.79	24.10	2.01	1.69	104
Malaysia	2.36	1.97	12.82	6.36	4.89	21.11	1.68	1.26	138
Hungary	1.88	1.68	13.91	8.12	4.91	18.05	1.27	0.99	17
Czech_Republic	1.39	1.30	5.45	4.60	5.23	18.84	0.82	0.69	22
Italy	2.18	1.72	8.28	2.75	5.29	15.99	1.82	1.33	100
Greece	2.97	2.37	12.86	5.83	5.34	18.01	2.49	1.76	92
Poland	2.00	1.75	9.19	4.68	5.48	18.21	1.51	1.27	37
South_Korea	1.33	1.18	8.01	3.21	5.78	19.88	1.08	0.70	140
Turkey	3.33	2.70	22.02	6.05	6.45	126.51	2.85	2.52	6
Argentina	1.50	1.33	7.97	4.45	6.59	10.94	0.98	0.71	21
China	1.47	1.34	10.26	5.72	6.77	7.65	0.94	0.74	53
Mexico	1.90	1.63	12.36	6.06	6.78	30.86	1.21	0.87	32
Thailand	2.10	1.63	15.24	6.52	7.02	31.72	1.40	0.92	51
Colombia	1.12	1.02	8.92	3.80	7.06	36.79	0.54	0.31	7
Philippines	2.24	1.80	13.58	6.46	7.09	21.78	1.72	1.15	35
India	3.33	2.56	18.99	8.69	7.23	23.74	2.73	1.88	22
Venezuela	1.74	1.52	11.70	6.03	7.42	28.09	1.05	0.69	3
Pakistan	2.50	1.87	21.55	7.41	7.83	34.66	2.17	1.28	20
Indonesia	1.95	1.50	11.40	6.28	8.01	21.67	1.48	0.76	22
Average	2.26	1.83	12.44	5.52	3.90	21.07	1.76	1.26	141
Standard deviation	0.49	0.35	3.64	1.64	2.41	17.84			

Table 2
Country-level Analysis of Corruption and Firm Valuation

This table presents country-level evidence on the relation between corruption and firm valuation. Panel A reports the result of pooled regressions, in which the country mean PB and Tobin's Q ratios are regressed on each country's corruption index (Corrupt). Panel B reports the mean PB and Tobin's Q when countries are sorted annually into three equal-sized tertiles (low, mid, and high) on the basis of their corruption index. The number of observations for Panel B is the number of country-years in the sample. Panel C reports a comparison of the time-series average of each country's PB and Tobin's Q. To construct this panel, countries are first sorted into three equal-sized tertiles (low, mid, and high) on the basis of their average corruption indices over the years. Table values represent the mean value for the countries in each tertile. The number of observations for Panel C is the number of countries in the sample. All accounting variables are from the most recent fiscal year end. Market values are as of June 30th each year. PB is the price to book ratio. Tobin's Q is defined as market capitalization plus total debt divided by book equity plus total debt. Corrupt is the level of corruption for each country as reported annually by Transparency International. We report t-statistics in bracket. R-square is reported in Panel A, and the number of observations is reported for each model. The sample period is from 6/1994 to 6/2003, inclusive.

	Panel A: Pooled Regression	
	PB	Tobin's Q
Intercept	2.416	1.953
	(34.29)	(38.76)
Corrupt	-0.047	-0.035
	(-3.01)	(-3.12)
R-sq	0.019	0.020
Observations	424	424

	Panel B: Annual Country Sort	
	PB	Tobin's Q
Low Corrupt	2.358	1.910
Mid Corrupt	2.194	1.771
High Corrupt	1.883	1.559
Difference	0.475	0.351
	(3.50)	(3.53)
Observations	424	424

	Panel C: Country Averages	
	PB	Tobin's Q
Low Corrupt	2.391	1.921
Mid Corrupt	2.309	1.881
High Corrupt	2.022	1.672
Difference	0.369	0.249
	(2.01)	(1.77)
Observations	44	44

Table 3
Regression of PB and Tobin's Q Ratios on Various Explanatory Variables

This table presents firm-level evidence on the relation between corruption and firm valuation. Specifically, we report the results of a pooled regression of the form:

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

where $V_{i,t}$ is the price-to-book ratio (PB) in panel A, and Tobin's Q in panel B. Aside from Transparency International corruption perception index (Corrupt), the explanatory variables include firm characteristics: ROE (for the Price-to-book regressions) or ROA (for the Tobin's Q regressions), profit margin (Profit Margin), R&D-to-Net-Sales (R&D), and the dividend-payout ratio (Dividend Payout) as well as country characteristics: Country Beta, Currency Beta, real GDP growth (GDPg), and annual percentage inflation rate (Inflation). Appendix I contains details on how these variables are computed.

We report cluster-corrected t-statistics tha adjust for country-level correlations using a Huber-White estimation procedure. The number of observations is reported for each model. The sample period is from 6/1994 to 6/2003, inclusive.

	Panel A: Price-to-Book				
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	2.843	2.409	3.125	2.775	2.569
	(16.38)	(17.34)	(20.44)	(16.52)	(12.53)
Corrupt	-0.107	-0.086	-0.101	-0.122	-0.085
	(-2.69)	(-2.43)	(-2.78)	(-2.69)	(-2.36)
ROE		0.021			0.020
		(4.50)			(4.44)
Profit Margin		0.000			0.000
		(-2.17)			(-2.25)
R&D		0.043			0.042
		(1.82)			(1.82)
Dividend Payout		0.000			0.000
		(-4.89)			(-5.17)
Country Beta			-0.303		-0.198
			(-3.15)		(-1.60)
Currency Beta			-0.162		-0.141
			(-3.91)		(-4.54)
GDPg				0.034	0.012
				(1.38)	(0.60)
Inflation				0.011	0.006
				(1.07)	(0.80)
Adj R-sq	0.0065	0.0640	0.0154	0.0081	0.0709
Observations	58766	50112	57239	58766	48878

	Panel B: Tobin's Q				
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	2.279	1.915	2.529	2.224	1.698
	(16.86)	(17.26)	(19.70)	(17.13)	(8.07)
Corrupt	-0.080	-0.059	-0.076	-0.095	-0.051
	(-2.66)	(-2.21)	(-2.78)	(-2.77)	(-2.03)
ROA					0.072
					(7.41)
Profit Margin		0.000			0.000
		(-2.15)			(-1.72)
R&D		0.039			0.036
		(1.82)			(1.87)
Dividend Payout		0.000			0.000
		(-3.77)			(-4.78)
Country Beta			-0.269		-0.070
			(-3.74)		(-0.75)
Currency Beta			-0.099		-0.072
			(-3.39)		(-2.37)
GDPg				0.027	0.007
				(1.50)	(0.48)
Inflation				0.013	0.002
				(1.44)	(0.33)
Adj R-sq	0.0064	0.0666	0.0142	0.0086	0.1589
Observations	58766	50112	57239	58766	48875

Table 4

Regression of PB and Tobin's Q Ratios on Corruption, Expected Growth (g*), Expected ROE (ROE*), and Expected Returns (r*)

This table presents firm-level evidence on the relation between corruption and firm valuation. Specifically, we report the results of a pooled regression of the form:

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

where $V_{i,t}$ is the price-to-book ratio (PB) in panel A, and Tobin's Q in panel B. Aside from Transparency International corruption perception index (Corrupt), the explanatory variables include expected earnings growth rate (g*), expected ROE (ROE*), expected ROA (ROA*) and expected returns (r*). These three variables are calculated from a set of first stage regressions, which are reported in Appendix II.

We report the cluster-corrected t-statistics (t) that adjust for country-level correlations using a Huber-White estimation procedure. The number of observations is reported for each model. The sample period is from 6/1994 to 6/2003, inclusive.

	Panel A: Price-to-Book				
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	2.843	1.835	2.025	2.782	1.370
	(16.37)	(3.87)	(7.57)	(10.23)	(2.37)
Corrupt	-0.107	-0.103	-0.057	-0.111	-0.075
	(-2.69)	(-2.13)	(-1.24)	(-2.70)	(-1.56)
Expected Growth (g*)		0.051			0.053
		(2.27)			(1.95)
Expected ROE (ROE*)			0.064		0.030
			(3.63)		(0.96)
Expected Return (r*)				0.006	0.007
				(0.52)	(0.39)
Adj R-sq	0.0065	0.0107	0.0125	0.0079	0.0147
Observations	58766	56845	50499	57137	49298

	Panel B: Tobin's Q				
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	2.279	1.459	1.575	2.144	1.370
	(16.87)	(4.19)	(10.27)	(8.46)	(5.42)
Corrupt	-0.080	-0.075	-0.042	-0.073	-0.059
	(-2.66)	(-2.02)	(-1.45)	(-2.07)	(-1.99)
Expected Growth (g*)		0.041			0.023
		(2.54)			(1.16)
Expected ROA (ROA*)			0.109		0.069
			(6.59)		(1.38)
Expected Return (r*)				0.011	0.002
				(0.89)	(0.18)
Adj R-sq	0.0064	0.0110	0.0189	0.0083	0.0217
Observations	58766	56845	50499	57137	49298

Table 5
Regression of PB and Tobin's Q Ratios using the largest 300 firms in the country

This table presents firm-level evidence on the relation between corruption and firm valuation. Specifically, we report the results of a pooled regression of the form:

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

where $V_{i,t}$ is the price-to-book ratio (PB) in panel A, and Tobin's Q in panel B. Aside from the corruption perception index (Corrupt), the explanatory variables include expected country earnings growth rate (g*), expected country ROE (ROE*) and expected country returns (r*). The first stage regressions for g*, ROE* and r* are done separately (not reported). The sample is limited to the 300 firms that have the largest market capitalization in each country.

We report cluster-corrected t-statistics that adjust for country-level correlations using a Huber-White estimation procedure. The number of observations is reported for each model. The sample period is from 6/1994 to 6/2003, inclusive.

	Panel A: Price-to-Book				
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	2.847	1.737	2.347	3.919	0.749
	(12.81)	(1.68)	(6.38)	(4.77)	(0.64)
Corrupt	-0.097	-0.099	-0.069	-0.220	-0.125
	(-2.13)	(-1.72)	(-1.32)	(-2.26)	(-1.18)
Expected Growth (g*)		0.062			0.113
		(0.99)			(1.48)
Expected ROE (ROE*)			0.044		0.031
			(1.62)		(0.72)
Expected Return (r*)				-0.083	-0.022
				(-1.61)	(-0.74)
Adj R-sq	0.0076	0.0112	0.0113	0.0234	0.0333
Observations	36022	34101	29867	34404	28677

	Panel B: Tobin's Q				
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	2.223	1.533	1.602	2.754	0.999
	(16.22)	(2.60)	(6.71)	(5.82)	(1.61)
Corrupt	-0.064	-0.063	-0.043	-0.127	-0.105
	(-2.09)	(-1.66)	(-1.33)	(-2.22)	(-1.42)
Expected Growth (g*)		0.039			0.065
		(1.09)			(1.61)
Expected ROE (ROE*)			0.118		0.076
			(2.55)		(1.94)
Expected Return (r*)				-0.041	-0.027
				(-1.39)	(-1.10)
Adj R-sq	0.0061	0.0082	0.0176	0.0138	0.0296
Observations	36022	34101	29867	34404	28677