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Do anti-bribery laws reduce the cost of equity? Evidence from the UK Bribery Act 2010

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Abstract

We examine the impact of the UK Bribery Act 2010 on the implied cost of equity. We find a significant reduction in the cost of equity amongst UK firms with high bribery exposure after the passage of the Bribery Act. We further show that the Bribery Act improves internal control systems and increases stock liquidity of firms with high bribery exposure. Our results suggest that more stringent anti-bribery regulations are not always bad for the firm.

KEYWORDS

anti-bribery law, bribery, cost of equity, information asymmetry, internal control, residual income valuation, stock liquidity

JEL CLASSIFICATION

G30, G38, K22

1 | INTRODUCTION

Corruption is prevalent worldwide and is commonly cited as a significant deterrent to economic growth (Bardhan, 1997; Sensson, 2005; Shleifer & Vishny, 1993). As a common form of corruption, corporate bribery is increasingly becoming an important concern for policymakers as well as corporate stakeholders around the world (Cheung, Rau, & Stouraitis, 2012; Karpoff, Lee, & Martin, 2017). The World Bank Institute estimates that $1 trillion a year is paid in bribes (Rose-Ackerman, 2004). In a survey of corporate managers in 125 countries, D'Souza and Kaufmann (2013) find that more than 60% of participants believe that their competitors use bribes to secure a public contract. Similarly, the *Dow Jones State of Anti-Corruption Survey* in 2014 finds that a third of companies claim to have lost business to unethical competitors.

Becker (1968) models corporate misbehaviors as an economic decision that involves trade-offs between benefits and costs. Paying bribes in foreign countries may potentially benefit firms by helping them expedite through the inefficient bureaucratic process (Huntington, 1968; Leff, 1964). Indeed, Cheung et al. (2012) find that paying bribes brings an average firm $11 per each dollar of bribe paid. Karpoff et al. (2017) estimate the costs and benefits of bribery and find that, even after netting out expected financial and reputational costs, projects involving bribes remain profitable to firms. Zeume (2017) documents a decline in value of UK firms since the Bribery Act 2010 came into force due to reduced growth opportunities and concludes that paying bribes is a necessary cost of doing business.

Conversely, paying bribes can be costly to the firm. In addition to the risk of penalties and prosecutions (Murphy, Shrieves, & Tibbs, 2009), corporate bribery may endanger the firm's reputation and strain relations with stakeholders (D'Souza & Kaufmann, 2013; Serafeim, 2014). Focus on paying bribes to win business can also distract firms from investing in value-enhancing long-term projects (Birhanu, Gambardella, & Valentini, 2016). Furthermore, bribery may make firms more opaque (see, e.g., Dass, Nanda, & Xiao, 2016). For instance, firms may conceal transactions to divert funds for paying bribes. These bribery-related activities can potentially lead to firms becoming risky to outside shareholders. This motivates us to study the relation between bribery and risk to shareholders.

We use the firm's cost of equity as a proxy for risk to shareholders, and estimate the cost of equity using the residual income valuation model (Easton & Sommers, 2007; O'Hanlon & Steele, 2000). This approach has several appeals. First, we can estimate the cost of equity using only market and accounting variables, which are readily available for our sample firms. Second, we avoid the issues associated with using analyst earnings forecast data, such as forecast bias and timeliness (Guay, Kothari, & Shu, 2011; Lys & Sohn, 1990). Finally, although our analysis does not focus on a firm's growth rate, the residual income valuation model allows us to estimate the growth rate simultaneously with the implied cost of equity. As the literature suggests that growth is an important motive for firms to engage in bribery (Cheung et al., 2012; Karpoff et al., 2017; Zeume, 2017), we are able to take directly into account the effect of bribery on firm growth when we estimate the effect of bribery on risk.

Identifying the effect of bribery on firm risk is challenging because bribes are usually undisclosed unless they are detected, which is typically a rare event (Karpoff et al., 2017). To overcome this identification challenge, we use a difference-in-difference design to exploit the significant improvement in bribery prevention generated by the UK Bribery Act 2010 (hereafter "the Bribery Act"). The Bribery Act is the first UK legislation that explicitly addresses bribery by corporations, and this legislation substantially increases the severity of penalties for corporations that pay or take bribes, including cases where a corporation fails to prevent bribery because its internal control system is inadequate (Zeume, 2017). Before introducing the Bribery Act, the UK lagged far behind other Organization for Economic Co-operation and Development (OECD) countries in terms of bribery prevention; now, its legislation on bribery is among the strictest.[1] We argue that this significant change in the legal environment particularly affects firms that were already operating in bribe-prone countries before the passage of the Bribery Act, and examine the law's influence on their cost of equity in a difference-in-difference setting.

Controlling for decline in the expected growth rate, we find that the Bribery Act is associated with a 4% reduction in the implied cost of equity for firms with high bribery exposure.[2] Given that our model estimates the average cost of equity for these firms to be 12.5%, this is an economically substantial reduction, amounting to almost one-third of these firms' cost of equity. Our results suggest that the Bribery Act significantly reduces the risk of firms that operate in bribe-prone countries.

We perform several robustness checks to validate our main findings. We show that our results are not sensitive to how we classify firms as having high exposure to bribery, nor to several alternative earnings measures. We further show that our results hold when including loss observations in our sample and performing value-weighted instead of equally-weighted regressions (Easton, 2007; Easton & Sommers, 2007). Because the UK contemporaneously changed its tax regime on foreign corporate income, we alleviate the concern that this may have driven our documented change in the cost of equity by directly controlling for each firm's exposure to tax on foreign income; we still find that the change in cost of equity is only prevalent among firms with high exposure to foreign bribery. Further, we validate the parallel trend assumptions in our difference-in-difference design (Atanasov & Black, 2016; Roberts & Whited, 2012) by repeating our analysis using several artificial event years, and also performing our analysis on an entropy-balanced sample (Hainmueller, 2012; Hainmueller & Xu, 2013). Overall, these additional results support our

[1] See Transparency International, "The Bribery Act": https://www.transparency.org.U.K./our-work/business-integrity/bribery-act/

[2] We construct a measure of bribery exposure using Transparency International's Corruption Perceptions Index (CPI). Transparency International assigns each country a score between 0 and 100, with a higher score indicating less exposure to corruption. For each firm, we compute an average CPI score, weighted by the firm's sales in different geographical segments. We classify "high bribery-risk" firms as those whose weighted CPI score is less than or equal to the sample's 25th percentile.

main finding that the Bribery Act significantly reduces the cost of equity of firms with business operations in bribe-prone countries.

We present evidence that the Bribery Act affects cost of equity by improving corporate internal control (Ashbaugh-Skaife, Collins, Kinney, & Lafond, 2009; Beneish, Billings, & Hodder, 2008) and stock liquidity (e.g., Lang, Lins, & Maffett, 2012; Pagano & Volpin, 2012). Using data from ASSET4's anti-bribery database, we find that the Bribery Act is associated with a significant improvement in corporate internal control to prevent bribery among firms that operate in bribe-prone countries. Similarly, we find that the Bribery Act is associated with a significant decline in the bid-ask spread and Amihud's (2002) illiquidity measure, suggesting that the stocks of firms exposed to bribery have become more liquid after the Bribery Act passed. Overall, our results highlight the positive effects of the Bribery Act on a firm's cost of equity through improving the internal control system and stock liquidity.

This paper complements existing studies on the impact of foreign bribery prevention laws (e.g. Cheung et al., 2012; Karpoff et al., 2017; Zeume, 2017). In particular, Zeume (2017) finds that the UK Bribery Act is associated with reduced growth opportunities and a decline in firm value. Our results suggest that, despite the negative overall effect on firm value, the Bribery Act improves corporations' internal control systems and stock liquidity. Consequently, equity shareholders demand a lower rate of return, which results in a lower estimated cost of equity.

Our study also contributes to the debate on the costs and benefits of anti-bribery laws. Recent high-profile cases have demonstrated to policymakers that foreign bribery remains prevalent.[3] Proponents of anti-bribery laws argue that bribery increases the overall cost of business operations and undermines business confidence (Kennedy & Danielson, 2011). For instance, Christine Lagarde, as the Chair of the International Monetary Fund, refers to bribery as "a corrosive force that eviscerates the vitality of business and stunts a country's economic potential".[4] In contrast, critics of these laws argue that they impose unnecessarily large compliance costs (e.g., Weissmann & Smith, 2010). Our results highlight the risk reduction benefit of anti-bribery laws. Despite the loss in business opportunities (Hines, 1995; Zeume, 2017) and the increased compliance costs (Aguilera & Vadera, 2008; Collins, Uhlenbruck, & Rodriguez, 2009; D'Souza & Kaufmann, 2013), strengthened internal control and enhanced corporate transparency can reduce adverse selection risk of these firms (Kolstad & Wiig, 2009; Pagano & Roell, 1996), resulting in the reduction of required return to shareholders.

2 | INSTITUTIONAL SETTING AND HYPOTHESIS DEVELOPMENT

2.1 | UK Bribery Act 2010

The Bribery Act was passed on March 25, 2009. This legislation is the first UK legislation that explicitly addresses bribery by corporations, and substantially increases the severity of penalties compared to previous anti-bribery legislation. The enactment of the Bribery Act has resulted in the UK moving from a country that failed to meet the OECD Anti-Bribery Convention to be amongst the countries that have the most stringent anti-bribery legislation.[5] Specifically, the Bribery Act imposes unlimited fines and jail terms up to ten years for bribing and taking bribes. The legislation applies to individuals or companies that use bribes in the UK or elsewhere, and extends to corporations

[3] A recent example is Goldman Sachs' involvement in alleged embezzlement from Malaysia's state-run investment fund. According to court documents, Goldman Sachs' employees paid bribes to state officials to secure large underwriting deals. See: https://www.nytimes.com/2018/11/01/business/goldman-sachs-malaysia-investment-fund.html.

[4] See "Addressing corruption with clarity", Brookings Institution, Washington DC, September, 18, 2017. Available at: https://www.imf.org/en/News/Articles/2017/09/18/sp091817-addressing-corruption-with-clarity.

[5] UK legislation on bribery can be traced back to the Public Bodies Corrupt Act 1889, which confined bribery to the public sector and criminalized the soliciting or receiving of a bribe by a public officer. The law was reformed by the Prevention of Corruption Act 1906, which expanded bribery to the private sector, and the Prevention of Corruption Act 1916, which further lightened the burden of proving corruption. Due to the complexity and uncertainty arising from having several laws related to bribery, the UK failed to bring any foreign bribery case to court and risked being sanctioned by the OECD.

with UK operations, employing UK citizens, or providing services to any UK organization. Unlike previous UK anti-bribery laws and the US Foreign Corrupt Practices Act (FCPA), the Bribery Act also covers facilitation payments that aim to induce the performance of routine and obligatory government tasks (Trautman & Altenbaumer-Price, 2013). It also has a wider scope of application, including all forms of bribes to not only foreign public officials but also private operators.

The Bribery Act also imposes substantial fines if a corporation fails to prevent bribery because its internal control system is insufficient. Corporations must establish effective anti-bribery systems and controls, such as: (i) adequate procedures; (ii) top (board)-level commitment; (iii) risk assessment; (iv) due diligence; (v) communication and training; and (vi) monitoring and review. Risk-based due diligence must also extend to counterparties like contractors and suppliers. Overall, the Bribery Act has changed the basis for corporate criminal liability from personnel misconduct within the firm to the quality of the system governing the firm's activities (Mukwiri, 2015).

2.2 | Bribery and cost of equity

Recent empirical evidence suggests that bribery in foreign countries facilitates business expansion and, ultimately, firm growth. Cheung et al. (2012) find that each $1 paid in bribes increases a firm's market valuation by $11. Karpoff et al. (2017) find that, even when firms are caught bribing, the financial benefits from foreign bribery still more than offset any associated fines, legal expenses, and reputational losses. They also find that reputational losses associated with bribery are negligible.

Other studies contend that bribery prevention laws can potentially reduce a firm's competitiveness in countries where bribery is prevalent (Iriyama, Kishore, & Talukdar, 2016). Hines (1995) finds that the US Foreign Corrupt Practices Act is associated with a significant reduction in operations by US firms in bribe-prone countries. Similarly, Zeume (2017) finds that the Bribery Act reduces the growth of UK firms operating in corruption-prone countries and argues that the Bribery Act has increased the cost of doing business overseas for UK firms.

The passage of the UK Bribery Act can result in a reduction in firm risk and, consequently, the cost of equity. The literature recognizes corporate misconduct, including bribery, as a business risk (e.g., Lyon & Maher, 2005; Murphy et al., 2009); consequently, a law that discourages managers from engaging in misconduct can potentially reduce a firm's business risk. Further, bribery can make firms more opaque: they may withhold financial information to divert funds to pay for bribes (Dass et al., 2016; Smith, 2016). Information risk has been found to be priced in by equity holders (Ashbaugh-Skaife et al., 2009; Beneish et al., 2008), and can thus affect the cost of equity. By criminalizing failure to prevent bribery, the Bribery Act reduces managers' incentives to engage in bribery, and may thereby decrease a firm's risk and its cost of equity.

Hypothesis 1: The UK Bribery Act is associated with a reduction in cost of equity.

On the other hand, the Bribery Act may increase a firm's risk because it increases the propensity of and the costs associated with being caught. Compared to previous UK legislation, the OECD Anti-Bribery Convention, and the US Foreign Corrupt Practices Act, the Bribery Act applies to a significantly wider range of activities and imposes a much higher maximum fine. Therefore, the adverse financial consequences of being caught engaging in bribery have become more severe. Further, the Bribery Act potentially disadvantages UK firms compared to competitors not covered by the law, particularly local competitors in bribe-prone countries (Zeume, 2017). Prohibition of paying bribes can also increase the likelihood of losing business opportunities to local competitors (De Jong, Tu, & van Ees, 2012).

Hypothesis 2: The UK Bribery Act is associated with an increase in cost of equity.

TABLE 1 Summary statistics

Variable	N	Mean	St Dev	p25	p50	p75
Segment CPI	6,071	69.339	13.270	61.920	74.240	80.810
Earnings Per Share	6,071	0.248	0.446	0.037	0.110	0.275
Book Value Per Share	6,071	1.681	3.190	0.401	0.899	1.861
Ln Market Capitalization	5,661	11.948	2.273	10.219	11.781	13.538
Book-to-Market	5,661	0.700	0.749	0.297	0.500	0.831
Leverage	5,661	0.161	0.150	0.018	0.137	0.257
Cash Flow from Operation	5,661	0.097	0.090	0.049	0.089	0.139
Working Capital Ratio	1,927	1.542	1.131	0.923	1.296	1.734
Ownership Concentration	1,927	15.490	18.627	0.800	8.500	24.840
Anti-Bribery Score	1,982	2.141	2.121	0.000	2.000	4.000
Bid-Ask Spread	4,239	0.042	0.060	0.004	0.025	0.054
Illiquidity	4,239	0.004	0.029	0.000	0.000	0.002
Return Volatility	4,239	0.024	0.014	0.016	0.021	0.028
Ln Trading Volume	4,239	5.123	2.186	3.597	4.947	6.694
Stock Turnover	4,239	0.004	0.010	0.002	0.003	0.005

Notes: *Segment CPI* score is a sum product of Transparency International's Corruption Perception Index score and the firm's sales in different geographical segments, scaled by total sales. *Anti-Bribery Score* is an index constructed using six indicators of anti-bribery/corruption provisions provided by ASSET4. Other variables are from Datastream/Worldscope. All variables are defined in Appendix A.

3 | SAMPLE, VARIABLES, AND MODEL

3.1 | Sample

Our sample comprises 6,071 observations covering 1,022 firms listed on the London Stock Exchange (LSE) and the Alternative Investment Market (AIM) during the period 2003–2015.[6] We obtain financial accounting and market data from Datastream/Worldscope. Following prior studies (e.g., Easton, Taylor, Shroff, & Sougiannis, 2002; O'Hanlon & Steele, 2000), we exclude observations with missing values, financial firms, and firms with negative book equity. We also follow the prior literature (e.g., Dechow, Hutton, & Sloan, 1999; O'Hanlon & Steele, 2000) and exclude observations with negative earnings, as these observations are unlikely to provide a meaningful anchor for valuation (Easton, 2007), and the importance of earnings to valuation of loss firms can differ to valuation of profitable firms (Collins, Pincus, & Xie, 1999). Table 1 presents the summary statistics of all key variables.

3.2 | Measuring firm exposure to bribery

Following prior literature (Cheung et al., 2012; Karpoff et al., 2017; Zeume, 2017), we assume that a firm's propensity to engage in bribery is positively related to its exposure to bribe-prone countries. To measure firm-level exposure to bribery, we use Transparency International's Corruption Perceptions Index (CPI) to measure the prevalence of bribery

[6] We exclude 2009 from our sample period, as the law was passed in 2009 but became effective in 2010.

in a country, and construct a weighted-average *Segment CPI* score for each firm based on its sales in different geographical segments.[7] Specifically, our firm-level measure for exposure to bribery is:

$$\text{Segment CPI}_{i,t} = \sum_{s=1}^{S}\left(\frac{\text{Segment Sales}_{i,t,s}}{\text{Total Sales}_{i,t}} \times \text{CPI}_{s,t}\right) \quad (1)$$

where $CPI_{s,t}$ is the CPI score for geographic segment s in year t. The CPI score ranges from 0 to 100, with a *lower* score indicating that a country is *more* prone to bribes. We then construct an indicator variable, *Bribery Exposure*, which equals 1 if *Segment CPI* is less than or equal to the 25th percentile of the firms in our sample, and 0 otherwise. The firms with *Bribery Exposure* equal to 1 are likely to be more strongly affected by the Bribery Act.

3.3 | Empirical model: The residual income valuation model

We follow Easton and Sommers (2007) by using the residual income valuation model based on current accounting and price data:

$$\frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_1 \frac{p_{jt} - bps_{jt}}{bps_{jt-1}} + \xi_{jt} \quad (2)$$

where $\delta_0 = r$ and $\delta_1 = (r - g')/(1 + g')$.

This model is an adaptation of the model employed in O'Hanlon and Steele (2000),[8] which allows us to simultaneously estimate the implied cost of equity (r) and the expected growth rate in the residual income (g') from accounting and price information available at the end of period t. We use Equation (2) as the basis for our regression analysis. Specifically, the estimated coefficient for the intercept term (δ_0) provides an estimate of the implied cost of capital, which is our main parameter of interest (Easton, 2007; Easton & Sommers, 2007).

While the expected growth rate is not this study's main focus, we avoid potential bias from arbitrary assumptions of this rate by estimating it simultaneously with the implied cost of equity. Further, using current realized earnings allows us to circumvent the problems associated with analyst earnings forecast data. For instance, Guay et al. (2011) identify a common delay between stock price changes and analysts updating their forecasts. Lys and Sohn (1990) find that analysts' short-term earnings forecasts contain only 66% of the information reflected in security prices before the forecast release date. Additionally, using only price and accounting variables allows us to include more firms in our sample.

We extend Equation (2) to allow both the implied cost of equity and growth rate to change after the Bribery Act was passed. First, we define a dummy variable *Bribery Act*, which equals 1 from 2010 to 2015 and 0 from 2003 to 2008, and include this variable in our model as follows:

$$\frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_0' * Bribery\ Act + \delta_1 * \frac{p_{jt} - bps_{jt}}{bps_{jt-1}} + \delta_1' * Bribery\ Act * \frac{p_{jt} - bps_{jt}}{bps_{jt-1}} + \xi_{jt} \quad (3)$$

[7] Where a company reports the geographic segment as combined regions or as continents, the average of CPI scores from all countries in the region/continents is used.

[8] Whereas Easton and Sommers (2007) use the financial year end's market price (p_{jt}) for the numerator of the right-hand-side variable $(p_{jt} - bps_{jt})$, O'Hanlon and Steel (2000) use the average of a firm's market price at the end of the financial reporting month and six subsequent months. As our analysis compares the cost of equity before and after the Bribery Act was passed, we follow the former approach to avoid using information that is not available in the current period.

As the Bribery Act is likely to disproportionately affect firms that operate in bribe-prone countries, we include an indicator variable *Bribery Exposure*, which equals 1 for firms with high exposure to bribe-prone countries, and 0 otherwise. The resulting difference-in-difference specification is as follows:

$$\frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_0' * Bribery\ Act + \delta''_0 * Bribery\ Act * Bribery\ Exposure + \delta_1 * \frac{p_{jt} - bps_{jt}}{bps_{jt-1}} + \delta_1' * Bribery\ Act * \frac{p_{jt} - bps_{jt}}{bps_{jt-1}} + \delta''_1 * Bribery\ Act * Bribery\ Exposure * \frac{p_{jt} - bps_{jt}}{bps_{jt-1}} + \delta_2 * Bribery\ Exposure + \delta_3 * Bribery\ Exposure * \frac{p_{jt} - bps_{jt}}{bps_{jt-1}} + \xi_{jt}. \quad (4)$$

Our main coefficient of interest is δ''_0, which captures the change in implied cost of equity for firms with high bribery exposure after the Bribery Act passed, relative to the change for firms with low exposure to bribery.[9]

4 | RESULTS

4.1 | Main results: The UK Bribery Act 2010 and the implied cost of equity

Table 2 presents our main results. We first validate our residual income valuation model by estimating Equation (2). The results in Column (1) indicate that the average cost of equity for our sample firms during 2003–2015 is 10.4%, which is in line with the average rate of return on UK stocks.[10] In Column (2), which includes the Bribery Act indicator variable to allow both implied cost of equity and implied growth rate to change after the Bribery Act passed (Equation 3), we find that the average cost of equity is 11.3% in 2003–2008, and decreases by 1.7% to 9.6% in 2010–2015.

Column (3) presents our difference-in-difference estimation (Equation 4). Controlling for changes in the expected growth rate, we find that the coefficient for *Bribery Act* ∗ *Bribery Exposure* is negative and significant, indicating that the Bribery Act is associated with a reduction in the cost of equity among high bribery-exposure firms relative to firms with low bribery exposure. The coefficient estimates in Column (3) suggest that the Bribery Act has reduced the cost of equity for high bribery-exposure firms by 4.0% (1.1% + 2.9%), whereas the reduction is 1.1% for low bribery-exposure firms. Since Column (3) estimates that the average cost of equity for high bribery-exposure firms is 12.5% (11.1% + 1.4%), this reduction in the cost of equity is economically substantial, amounting to almost one-third of the average cost of equity of high bribery-exposure firms.

Column (4) includes year and firm fixed effects to eliminate the influence of any unobserved heterogeneity that is time invariant across firms and any market-wide variation across time periods. We find that the coefficient for *Bribery Act* ∗ *Bribery Exposure* remains statistically significant ($p < 0.05$). We also find that including firm and year fixed effects results in a larger estimated effect on the implied cost of equity (3.6%, compared to 2.9% in Column 3).

Overall, our main results indicate that the Bribery Act has significantly lowered the cost of equity for firms exposed to bribe-prone countries. Our evidence suggests that bribery regulations reduce the risk for equity holders, leading them to demand a lower rate of return for their investment.

[9] Equation 4 contains four nested models estimating four implied costs of equity (the intercepts) for four groups of firms: (1) firms with low exposure to bribery before the Bribery Act passed ($r = \delta_0$); (2) firms with low exposure to bribery after the Bribery Act passed ($r = \delta_0 + \delta_0'$); (3) firms with high exposure to bribery before the Bribery Act passed ($r = \delta_0 + \delta_2$); and (4) firms with high exposure to bribery after the Bribery Act passed ($r = \delta_0 + \delta_0' + \delta_0'' + \delta_2$). To measure the effect of the Bribery Act 2010 on firms with high exposure to bribery, we compare the difference between (1) the change in the implied cost of equity among high bribery-exposure firms pre- and post-Bribery Act, $(\delta_0 + \delta_0' + \delta_0'' + \delta_2) - (\delta_0 + \delta_2) = \delta_0' + \delta_0''$; and (2) the change in the implied cost of equity among low bribery-exposure firms pre- and post-Bribery Act, $(\delta_0 + \delta_0') - (\delta_0) = \delta_0'$. The difference between these two groups is $(\delta_0' + \delta_0'') - \delta_0' = \delta_0''$ which is the coefficient for *Bribery Act* ∗ *Bribery Exposure* in Equation 4—our main coefficient of interest.

[10] The average return on the FTSE 100 Index was 8.4% during 2003–2015 (or 11.5% if 2008 is excluded).

TABLE 2 The UK Bribery Act 2010 and the implied cost of equity

	Dependent Variable = eps_t/bps_{t-1}			
	(1)	(2)	(3)	(4)
Bribery Act × *Bribery Exposure*			−0.029*	−0.036**
			(0.017)	(0.018)
Bribery Act		−0.017**	−0.011	
		(0.007)	(0.007)	
Bribery Exposure			0.014	0.021
			(0.012)	(0.015)
$(p_t - \text{bps}_t)/bps_{t-1}$	0.048***	0.048***	0.049***	0.051***
	(0.002)	(0.002)	(0.003)	(0.003)
$(p_t - \text{bps}_t)/bps_{t-1}$ × *Bribery Act*		−0.000	−0.002	
		(0.004)	(0.004)	
$(p_t - \text{bps}_t)/bps_{t-1}$ × *Bribery Exposure*			−0.004	−0.003
			(0.005)	(0.006)
$(p_t - \text{bps}_t)/bps_{t-1}$ × *Bribery Act* × *Bribery Exposure*			0.008	0.010
			(0.008)	(0.006)
Intercept	0.104***	0.113***	0.111***	
	(0.003)	(0.005)	(0.006)	
Year fixed effects	No	No	No	Yes
Firm fixed effects	No	No	No	Yes
Observations	6,071	6,071	6,071	6,071
Adjusted R^2	0.503	0.504	0.504	0.455

Notes: This table reports the estimation of the extended residual income valuation model (Equation 3). The dependent variable is eps_t/bps_{t-1}, earnings per share scaled by lagged book value per share. *Bribery Act* is a dummy variable which equals one in 2010–2015, and zero in 2003–2008. *Bribery Exposure* is a dummy variable which equals one when a firm's weighted average Corruption Perceptions Index (CPI) score is in the bottom quartile of the sample. $(p_t - bps_t)/bps_{t-1}$ is the difference between market price and book value per share scaled by lagged book value per share. Standard errors (in parentheses) are clustered at the firm level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

4.2 | Robustness checks

Table 3 presents the results from various robustness checks. Panel A shows that our main results are not sensitive to how we classify firms as having high exposure to bribery. In our baseline results, the indicator variable *Bribery Exposure* is equal to 1 when a firm's weighted-average *Segment CPI* score is equal to or below the 25th percentile, and 0 otherwise. In Columns (1)–(4), we change this threshold to equal to or below the 10th, 20th, 30th, and 40th percentiles, respectively. We find that the coefficient for *Bribery Act* ∗ *Bribery Exposure* is statistically significant when firms with high bribery exposure are classified as those with a weighted-average *Segment CPI* score equal to or below the 10th or 20th percentile (Columns 1 and 2), but becomes weaker as we relax this threshold in Columns (3) and (4). These results support our conjecture that the Bribery Act has more strongly affected firms with higher exposure to bribe-prone countries. In Column (5), the *Bribery Exposure* indicator is replaced with the *negative value* of the weighted-average *Segment CPI* scores; our main finding continues to hold.[11] In Column (6), we use FTSE4Good bribery exposure data as an

[11] As a *lower Segment CPI* score suggests that a country is *less* transparent and *more* bribe prone, we use the negative value so that the coefficient is in the same direction as in our main results.

TABLE 3 Robustness checks

Panel A: Alternative measures for bribery exposure						
	Alternative thresholds for Segment CPI Scores				**Raw Segment**	**FTSE 4Good**
	10th percentile	**20th percentile**	**30th percentile**	**40th percentile**	**CPI Scores**	**Bribery Data**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Bribery Act × *Bribery Exposure*	−0.057*	−0.035*	−0.024	−0.020	−0.128**	−0.045**
	(0.032)	(0.021)	(0.017)	(0.015)	(0.060)	(0.022)
Other variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,071	6,071	6,071	6,071	6,071	2,700
Adjusted R^2	0.439	0.439	0.437	0.437	0.438	0.545

Panel B: Alternative earnings proxies		
	I/B/E/S Actual EPS	**Analyst Forward Earnings Forecasts (Easton et al., 2002)**
	(1)	**(2)**
Bribery Act × *Bribery Exposure*	−0.030*	−0.017**
	(0.017)	(0.008)
Other variables	Yes	Yes
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	5,381	4,358
Adjusted R^2	0.292	0.426

Panel C: Sensitivity test to the inclusion of loss observations			
	Full Sample (FTSE+AIM)	**FTSE**	**AIM**
Dependent Variable = eps_t/bps_{t-1}	**(1)**	**(2)**	**(3)**
Bribery Act × *Bribery Exposure* (equally weighted)	−0.018	−0.053*	0.030
	(0.023)	(0.027)	(0.032)
Bribery Act × *Bribery Exposure* (value weighted)	−0.031***	−0.023***	−0.013**
	(0.005)	(0.009)	(0.006)
Observations	8,900	3,965	4,935
Observations with earnings greater than zero	6,071 (68%)	3,325 (84%)	2,746 (56%)
Observations with earnings less than zero	2,829 (32%)	640 (16%)	2,189 (44%)

Panel D: Controlling for tax exposure on foreign income		
	Tax Exposure 1	**Tax Exposure 2**
Dependent variable = eps_t/bps_{t-1}	**(1)**	**(2)**
Bribery Act × *Bribery Exposure*	−0.042**	−0.040*
	(0.017)	(0.024)
Bribery Exposure	0.032*	0.020
	(0.017)	(0.017)

(Continues)

TABLE 3 (Continued)

Panel D: Controlling for tax exposure on foreign income		
	Tax Exposure 1	Tax Exposure 2
Dependent variable = eps_t/bps_{t-1}	(1)	(2)
Bribery Act × *Tax Exposure*	−0.002	0.003
	(0.002)	(0.027)
Tax Exposure	0.004	0.011
	(0.003)	(0.022)
Other variables	Yes	Yes
Year fixed effects	Yes	Yes
Firm fixed effects	Yes	Yes
Observations	6,071	6,071
Adjusted R^2	0.458	0.456

Notes: Panel A replaces *Bribery Exposure* with alternative measures for firms operating in bribery prone countries. Columns (1)–(4) change the threshold for high bribery exposure firms to those with weighted-average *Segment CPI* score below 10th, 20th, 30th, and 40th percentiles. Column (5) uses negative values of raw weighted-average *Segment CPI* scores and Column (6) uses FTSE4Good Bribery Risk. Column (1) of Panel B uses I/B/E/S Actual EPS as the proxy for earnings, instead of net income available to common shareholders. Column (2) of Panel B uses analyst forward earnings forecasts and employs the residual income valuation model from Easton et al. (2002). Panel C includes loss observations into the sample and estimates the residual income valuation model using equally-weighted and value-weighted regressions. Panel D include measures for corporate tax exposure on foreign income as additional control variables. Standard errors (in parentheses) are clustered at the firm level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

alternative data source to the CPI, and continue to find consistent results.[12] Overall, these results provide further evidence that firms with high bribery exposure have experienced a significant decrease in their cost of equity since the Bribery Act passed.

Panel B of Table 3 shows that our findings hold when using alternative proxies for earnings. Column (1) uses *I/B/E/S Actual EPS*, which excludes one-time items and, consequently, may be more representative of a firm's sustainable earnings (Easton, 2007). Column (2) follows Easton et al. (2002) by using I/B/E/S forecast EPS instead of reported earnings.[13] The results in both columns are consistent with our main results.

In Panel C of Table 3, we test the sensitivity of our findings to including loss observations. While our main tests follow prior studies by excluding observations with negative earnings from the sample (e.g., Dechow et al., 1999; O'Hanlon & Steele, 2000), only considering healthier firms may lead to biased inferences (Easton, 2007). For brevity, we only include the coefficient estimates for *Bribery Act* ∗ *Bribery Exposure*. In Column (1), we find that the coefficient for *Bribery Act* ∗ *Bribery Exposure* is negative but not statistically significant. This is potentially due to the large proportion of observations with negative earnings in this sample (32%), which suggests that this estimate for cost of equity may not be reliable (Easton, 2007). As our sample includes firms listed on the FTSE or the AIM, Columns (2) and (3) present separate results for observations from these two stock markets. We find that the coefficient for *Bribery Act* ∗ *Bribery Exposure* is negative and significant among FTSE firms, which notably have the smallest proportion of loss observations (16%). The overall results indicate that a large proportion of loss observations significantly influences the cost of equity estimation. Following Easton (2007) and Easton and Sommers (2007), we also estimate *value-weighted* regressions to reduce

[12] FTSE4Good bribery exposure data evaluates firms based on their operating industries, countries, and the extent to which the firms are involved in public contracts. We thank FTSE for providing us with the data.

[13] The residual income valuation model in Easton et al. (2002) is $\frac{eps_{jt+1}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{P_{jt}}{bps_{jt}} + \mu_{jt}$, where eps_{jt+1} is the next period's earnings forecasted at t, γ_0 is the implied growth rate, and γ_1 is the difference between the cost of equity and the implied growth rate. To directly estimate the cost of equity, we algebraically transform this model to $\frac{eps_{jt+1}}{p_{jt}} = \delta_0 + \delta_1 \frac{bps_t - p_{jt}}{p_{jt}} + \mu_{jt}$, where the intercept term δ_0 is the cost of equity.

the influence of negative earnings, which tend to be from smaller firms in the sample. We find that the value-weighted coefficients for *Bribery Act* ∗ *Bribery Exposure* are negative and statistically significant across all three columns.

Panel D alleviates the concern that our results are confounded by the contemporaneous passage of the Finance Act 2009, whereby the UK's tax regime transitioned from a worldwide tax system to a territorial tax system. After 2009, UK multinationals ceased to pay dividend tax on earnings from foreign countries with *lower* corporation tax rates than the UK's (Liu, 2018).[14] Because the effect of this tax reform is likely to manifest in financial year end 2010, we directly control for the tax exposure of UK firms on their foreign income. Specifically, we construct two measures for tax exposure:

Tax Exposure 1 is defined as the sum product of foreign sales and the foreign corporation tax rate scaled by total sales:

$$Tax\ Exposure\ 1_{i,t} = \sum_{s=1}^{S} \frac{Segment\ \ Sales_{i,s,t} \times Tax\ Rate_{s,t}}{Total\ Sales_{i,t}} \tag{5}$$

Tax Exposure 2 is defined as the sum product of foreign sales ratio and a dummy variable that equals 1 when the foreign corporation tax rate is below the UK's corporation tax rate:[15]

$$Tax\ Exposure\ 2_{i,t} = \sum_{s=1}^{S} \frac{Segment\ Sales_{i,s,t} \times D(Tax\ Rate < UK\ Tax\ Rate)_{s,t}}{Total\ Sales_{i,t}} \tag{6}$$

In Columns (1) and (2) of Panel D of Table 3, we include the two foreign tax exposure variables and their interaction with *Bribery Act* as additional control variables in the model. We find in both columns that *Bribery Act* ∗ *Tax Exposure* does not enter the model significantly, implying that the variation in UK firms' tax exposure on foreign income does not explain the change in their cost of equity after the Bribery Act passed. By contrast, we continue to find that the coefficient for *Bribery Act* ∗ *Bribery Exposure* is negative and statistically significant. These results suggest that the reduction in cost of equity is more likely to have resulted from the Bribery Act than the Finance Act 2009.

4.3 | Artificial event years and covariate balancing

The validity of our difference-in-difference design hinges on the parallel-trend assumption (Atanasov & Black, 2016; Roberts & Whited, 2012): specifically, absent the Bribery Act, the cost of equity for all our sample firms should move in the same way regardless of their exposure to bribe-prone countries. In this section, we perform additional sensitivity tests to check the validity of this assumption.

We first rule out the possibility that our results are driven by any pre-existing trend (Atanasov & Black, 2016) by performing several falsification tests. Specifically, we repeat our analysis using 2005, 2006, and 2007 as artificial event years, and present the results in Columns (1)–(3) of Table 4. As expected, the coefficients for *Bribery Act* ∗ *Bribery Exposure* are not statistically significant when we use these artificial event years. These results suggest that our findings are unlikely to be due to any pre-existing trend.

We also combine our difference-in-difference design with covariate balancing to ensure that the observations in our treatment and control groups are similar along several dimensions of covariates. Specifically, we use entropy balancing (Hainmueller, 2012; Hainmueller & Xu, 2013) to impose a weighting scheme on our observations, such that the means and variances of all covariates are exactly identical across treatment and control groups. Entropy balancing has several

[14] Prior to the 2009 reform, UK companies paid the difference between the UK corporation tax rate and the applicable foreign corporation tax rate on any income repatriated into the UK. Income from countries whose tax rate was higher than the UK's incurred no additional tax charge.

[15] We use 2010 tax rates obtained from the OECD Statutory Corporate Income Tax Rates, available at https://stats.oecd.org/index.aspx?DataSetCode = Table_II1.

TABLE 4 Validating the parallel trend assumption

	Artificial Event Years			
	2005	2006	2007	Entropy Balanced Sample
Dependent Variable = eps_t/bps_{t-1}	(1)	(2)	(3)	(4)
Bribery Act × *Bribery Exposure*	−0.033	−0.011	−0.018	−0.040***
	(0.022)	(0.022)	(0.019)	(0.018)
Other variables	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	6,071	6,071	6,071	5,445
Adjusted R^2	0.456	0.455	0.456	0.664

Notes: Columns (1), (2), and (3) present residual income valuation estimations in which the year the *Bribery Act* indicator variables are set to be equal to one when the observation year is greater than or equal to 2005, 2006, and 2007, respectively. Column (4) presents the residual income valuation estimation on an entropy balanced sample (Hainmueller, 2012; Hainmueller & Xu, 2013), in which 1,348 high bribery exposure observations are matched with 4,907 low bribery exposure observations. Standard errors (in parentheses) are clustered at the firm level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

advantages over other matching methods, such as propensity score matching or nearest-neighbor covariate matching. First, entropy balancing can be used to obtain a higher degree of balance for a large set of covariates, because it directly searches for a set of observation weights that give the treatment and control groups the same means and variances (Hainmueller, 2012). Second, the matching scheme in entropy balancing allows the weight of observations to continuously vary across different units (Hainmueller & Xu, 2013). Therefore, unlike nearest-neighbor or radius matching schemes, we do not need to keep or drop observations from the matched sample based on any arbitrary threshold. Consequently, we can retain a larger proportion of observations in the matched sample. Finally, the weights resulting from entropy balancing can be used flexibly with any standard estimators, including the difference-in-difference estimator.

We use entropy balancing to match our observations along several key covariates that can influence a firm's cost of equity: market capitalization, book-to-market ratio, cash flow from operations, stock return, sales growth, and leverage (see, e.g., Ashbaugh-Skaife et al., 2009; Lang et al., 2012).[16] The estimation using the entropy-matched sample is presented in Column (4) of Table 4. Consistent with our baseline results, the coefficient for *Bribery Act* ∗ *Bribery Exposure* is negative and statistically significant. This balanced-sample result provides further confidence that our main findings are unlikely to be driven by differences between firms with high and low exposure to bribery.

5 | POTENTIAL MECHANISMS

We find that the passage of the Bribery Act is associated with a significant reduction in cost of equity among firms with high exposure to bribe-prone countries. We postulate that this reduction is due to firms becoming less risky to equity holders, such that they demand a lower rate of return (Lang et al., 2012). This section provides evidence of potential mechanisms through which the Bribery Act reduces firm risk.

[16] In our baseline sample, the average high bribery-exposure firm is larger, has a lower book-to-market ratio, and has higher operating cash flows. These differences are statistically significant at the 1% level.

TABLE 5 The UK Bribery Act 2010 and corporate internal control

Dependent Variable = *Anti-Bribery Score*	(1)	(2)
Bribery Act × Bribery Exposure	0.506**	0.488**
	(0.200)	(0.198)
Bribery Exposure	−0.487**	−0.475**
	(0.193)	(0.197)
Leverage		−0.042
		(0.574)
Working Capital Ratio		−0.094
		(0.072)
Ln Ownership Concentration		0.004
		(0.004)
Book-to-Market		0.343*
		(0.203)
Ln Market Capitalization		0.161
		(0.133)
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	1,982	1,927
Adjusted R^2	0.602	0.602

Notes: The dependent variable is *Anti-Bribery Score*, an index constructed using six indicators related to anti-bribery/corruption provisions provided by ASSET 4. ASSET4's anti-bribery data comprise six indicators, namely whether the company: (1) mentions a public commitment to anti-bribery/corruption at the senior management or board level; (2) strengthens anti-bribery/corruption in its code of conduct; (3) adopts an internal management tool for bribery/corruption such as hotlines or whistleblowing systems; (4) has a policy to cope with bribery/corruption in business transactions; (5) communicates on bribery-relevant issues with employees in organizational processes; and (6) conducts employee training on anti-bribery/corruption. Other variables are defined in Appendix A. Robust standard errors clustered at the firm level are presented in parentheses. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

5.1 | Strengthened internal control system

One potential mechanism through which the Bribery Act decreases the cost of equity is by improving corporate internal control systems. The Bribery Act requires firms to implement an internal control system for bribery and corruption prevention and imposes significant personal and legal liability on managers if this system fails to prevent bribery (Bargeron, Lehn, & Zutter, 2010; Litvak, 2008). This should encourage firms to improve their internal control system to reduce the probability of negative outcomes associated with paying bribes (Birhanu et al., 2016; D'Souza & Kaufmann, 2013; Serafeim, 2014). Prior literature has evidenced the association between a firm's internal control system and its cost of equity (Ashbaugh-Skaife et al., 2009; Beneish et al., 2008).

In Table 5, we construct a variable *Anti-Bribery Score* from ASSET4's anti-bribery database.[17] The variable *Anti-Bribery Score* ranges from 0 to 6, with a higher score indicating that the firm has a stronger internal control system. Column (1) employs the difference-in-difference estimation with *Anti-Bribery Score* as the dependent variable. We find that the coefficient for *Bribery Act* ∗ *Bribery Exposure* is positive and significant, suggesting that, among firms with high exposure to bribery, the Bribery Act is associated with a significant improvement in corporate internal control to prevent

[17] ASSET4's anti-bribery data comprise six indicators, namely whether the company: (1) mentions a public commitment to anti-bribery/corruption at the senior management or board level; (2) strengthens anti-bribery/corruption in its code of conduct; (3) adopts an internal management tool for bribery/corruption such as hotlines or whistleblowing systems; (4) has a policy to cope with bribery/corruption in business transactions; (5) communicates on bribery-relevant issues with employees in organizational processes; and (6) conducts employee training on anti-bribery/corruption.

TABLE 6 The UK Bribery Act 2010 and stock liquidity

	Ln Bid-Ask Spread		*Ln Illiquidity*	
Dependent Variable =	**(1)**	**(2)**	**(3)**	**(4)**
Bribery Act × Bribery Exposure	−0.349***	−0.227***	−0.283***	−0.113*
	(0.067)	(0.055)	(0.103)	(0.069)
Bribery Exposure	0.201***	0.158***	0.107	0.118*
	(0.068)	(0.055)	(0.104)	(0.069)
Ln Market Capitalization		−0.462***		−0.736***
		(0.027)		(0.039)
Return Volatility		5.104***		0.002***
		(1.717)		(0.000)
Ln Trading Volume		−0.125***		−0.323***
		(0.036)		(0.082)
Ln Stock Turnover		0.028		−0.287***
		(0.034)		(0.068)
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	4,239	4,239	4,952	4,931
Adjusted R^2	0.262	0.434	0.227	0.542

Notes: The dependent variables are *Ln Bid-Ask Spread* (Columns 1 and 2), defined as the logarithm of daily closing ask price less the closing bid price scaled by the midpoint of the closing ask and bid prices, and *Ln Illiquidity* (Columns 3 and 4), defined as the logarithm of the average of daily ratio of absolute stock return to GBP trading volume multiplied by 1,000 (Amihud, 2002). Other variables are defined in Appendix A. We exclude observations in 2014–2015 due to the exemption of Stamp Duty Reserve Tax for trading on AIM and LSE high-growth stocks. Robust standard errors clustered at the firm level are presented in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10% levels, respectively.

bribery. In Column (2), we include several firm characteristics that can influence a firm's internal control system: market capitalization, book-to-market ratio, leverage, working capital ratio, and ownership concentration (see e.g., Doyle, Ge, & McVay, 2007); our results continue to hold. Overall, these findings indicate that the Bribery Act is indeed associated with improved internal control among high bribery-exposure firms.

5.2 | Increase in stock liquidity

As an enhanced internal control system can improve corporate transparency by mitigating management's ability to distort financial information or engage in concealed transactions (Dass et al., 2016; Leuz, Nanda, & Wysocki, 2003), the Bribery Act could reduce the information asymmetry between the firm and outsider shareholders (Beneish et al., 2008). This would, in turn, result in better stock liquidity by reducing the need for private information gathering and also reducing adverse selection in trading of the firm's stock (Chung, Elder, & Kim, 2010; Diamond & Verrecchia, 1991; Francis, LaFond, Olsson, & Schipper, 2007; Holmstrom & Tirole, 1993). As better liquidity reduces the cost of equity (e.g. Lang et al., 2012; Lin, Singh, & Yu, 2009), the improvement in stock liquidity could be a potential mechanism through which the Bribery Act reduces cost of equity.

Table 6 examines the effect of the Bribery Act on two key proxies for stock liquidity: (1) the bid-ask spread (Easley & O'Hara, 1987; Glosten & Milgrom, 1985; Kyle, 1985); and (2) Amihud's (2002) illiquidity measure. Column (1) shows that the bid-ask spread significantly decreases after the Bribery Act passed. In Column (2), we follow prior literature (e.g., Amiram, Owens, & Rozenbaum, 2016; Daske, Hail, Leuz, & Verdi, 2008) by including additional control variables: market capitalization, return volatility, trading volume, and stock turnover; our results

continue to hold. Columns (3) and (4) present consistent evidence when using Amihud's (2002) illiquidity measure. Overall, these findings offer evidence that the stock liquidity of high bribery-exposure firms increased after the Bribery Act passed.

6 | CONCLUSIONS

This paper examines the effect of the Bribery Act on cost of equity. We find that the implied cost of equity of firms with high exposure to bribe-prone countries has significantly decreased since the Bribery Act was passed. Among the same firms, we also find that the Bribery Act is associated with improvement in the corporate internal control system and also stock liquidity, suggesting that these are potential mechanisms through which the Bribery Act reduces firm risk.

With the costs and benefits of anti-bribery laws still being debated by policymakers and academics, our results contribute by showing the positive impact of one such law. Despite the concern that these laws may impede business expansion in some foreign markets and increase compliance costs, we highlight significant benefits in terms of improved internal control and stock liquidity. Our findings suggest that anti-bribery laws can benefit equity investors.

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DATA AVAILABILITY STATEMENT

The Corruption Perceptions Index is available from Transparency International's web site (https://www.transparency.org/research/cpi/overview). FTSE4Good bribery exposure is from a proprietary data set provided by FTSE. Financial accounting and market data are from Datastream/Worldscope, which requires a paid subscription.

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REFERENCES

Aguilera, R. V., & Vadera, A. K. (2008). The dark side of authority: Antecedents, mechanisms, and outcomes of organizational corruption. *Journal of Business Ethics*, *77*, 431–449.
Amihud, Y. (2002). Illiquidity and stock returns: Cross-section and time-series effects. *Journal of Financial Markets*, *5*, 31–56.
Amiram, D., Owens, E., & Rozenbaum, O. (2016). Do information releases increase or decrease information asymmetry? New evidence from analyst forecast announcements. *Journal of Accounting and Economics*, *62*, 121–138.
Ashbaugh-Skaife, H., Collins, D. W., Kinney, W. R., & Lafond, R. (2009). The effect of SOX internal control deficiencies on firm risk and cost of equity. *Journal of Accounting Research*, *47*, 1–43.
Atanasov, V., & Black, B. (2016). Shock-based causal inference in corporate finance and accounting research. *Critical Finance Review*, *5*, 207–304.
Bardhan, P. (1997). Corruption and development: A review of issues. *Journal of Economic Literature*, *35*, 1320–1346.
Bargeron, L., Lehn, K., & Zutter, C. (2010). Sarbanes-Oxley and corporate risk taking. *Journal of Accounting and Economics*, *49*, 34–52.
Becker, G. S. (1968). Crime and punishment: An economic approach. *Journal of Political Economy*, *76*, 169–217.

Beneish, M. D., Billings, M. B., & Hodder, L. D. (2008). Internal control weaknesses and information uncertainty. *The Accounting Review*, *83*, 665–703.
Birhanu, A. G., Gambardella, A., & Valentini, G. (2016). Bribery and investment. *Strategic Management Journal*, *37*, 1865–1877.
Cheung, Y. L., Rau, P. R., & Stouraitis, A. (2012). How much do firms pay as bribes and what benefits do they get? NBER Working Paper No. 17981.
Chung, K. H., Elder, J., & Kim, J. C. (2010). Corporate governance and liquidity. *Journal of Financial and Quantitative Analysis*, *45*, 265–291.
Collins, J. D., Pincus, M., & Xie, H. (1999). Equity valuation and negative earnings. *The Accounting Review*, *74*, 29–61.
Collins, J. D., Uhlenbruck, K., & Rodriguez, P. (2009). Why firms engage in corruption: A top management perspective. *Journal of Business Ethics*, *87*, 89–108.
Daske, H., Hail, L., Leuz, C., & Verdi, R. (2008). Mandatory IFRS reporting around the world: Early evidence on the economic consequences. *Journal of Accounting Research*, *46*, 1085–1142.
Dass, N., Nanda, V., & Xiao, S. C. (2016). Public corruption in the United States: Implications for local firms. *Review of Corporate Finance Studies*, *5*, 102–138.
De Jong, G., Tu, P. A., & van Ees, H. (2012). Which entrepreneurs bribe and what do they get from it? Exploratory evidence from Vietnam. *Entrepreneurship Theory and Practice*, *36*, 323–345.
Dechow, P. M., Hutton, A. P., & Sloan, R. G. (1999). An empirical assessment of the residual income valuation model. *Journal of Accounting and Economics*, *26*, 1–34.
Diamond, D. W., & Verrecchia, R. E. (1991). Disclosure, liquidity, and the cost of capital. *The Journal of Finance*, *46*, 1325–1359.
Doyle, J., Ge, W., & McVay, S. (2007). Determinants of weakness in internal control over financial reporting. *Journal of Accounting and Economics*, *44*, 193–223.
D'Souza, A., & Kaufmann, D. (2013). Who bribes in public contracting and why: Worldwide evidence from firms. *Economics of Governance*, *14*, 333–367.
Easley, D., & O'Hara, M. (1987). Price, trade size, and information in securities markets. *Journal of Financial Economics*, *19*, 69–90.
Easton, P. (2007). Estimating the cost of capital implied by market prices and accounting data. *Foundation and Trends in Accounting*, *2*, 241–364.
Easton, P., & Sommers, G. (2007). Effect of analysts' optimism on estimates of the expected rate of return implied by earnings forecasts. *Journal of Accounting Research*, *45*, 983–1015.
Easton, P., Taylor, G., Shroff, P., & Sougiannis, T. (2002). Using forecasts of earnings to simultaneously estimate growth and the rate of return on equity investment. *Journal of Accounting Research*, *40*, 657–676.
Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2007). Information uncertainty and post-earnings announcement drift. *Journal of Business Finance & Accounting*, *34*, 403–433.
Glosten, L., & Milgrom, P. (1985). Bid, ask, and transaction prices in a specialist market with heterogeneously informed traders. *Journal of Financial Economics*, *14*, 71–100.
Guay, W., Kothari, S. P., & Shu, S. (2011). Properties of implied cost of capital using analysts' forecasts. *Australian Journal of Management*, *36*, 125–149.
Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis*, *20*, 25–46.
Hainmueller, J., & Xu, Y. (2013). ebalance: A Stata package for entropy balancing. *Journal of Statistical Software*, *54*(7), 1–18.
Hines, J. R. (1995). Forbidden payment: Foreign bribery and American business after 1977. NBER Working Paper No. w5266.
Holmstrom, B., & Tirole, J. (1993). Market liquidity and performance monitoring. *Journal of Political Economy*, *101*, 678–709.
Huntington, S. P. (1968). *Political order in changing societies*. New Haven, CT: Yale University Press.
Iriyama, A., Kishore, R., & Talukdar, D. (2016). Playing dirty or building capability? Corruption and HR training as competitive actions to threats from informal and foreign firm rivals. *Strategic Management Journal*, *37*, 2152–2173.
Karpoff, J. M., Lee, D. S., & Martin, G. S. (2017). Foreign bribery: Incentives and enforcement. Available at https://ssrn.com/abstract=1573222.
Kennedy, D., & Danielson, D. (2011). *Busting bribery: Sustaining the global momentum of the Foreign Corrupt Practices Act*. New York, NY: Open Society Foundations.
Kolstad, I., & Wiig, A. (2009). Is transparency the key to reducing corruption in resource-rich countries? *World Development*, *37*(3), 521–532.
Kyle, A. (1985). Continuous auction and insider trading. *Econometrica*, *53*, 1315–1335.
Lang, M., Lins, K. V., & Maffett, M. (2012). Transparency, liquidity, and valuation: International evidence on when transparency matters most. *Journal of Accounting Research*, *50*, 729–774.
Leff, N. (1964). Economic development through bureaucratic corruption. *American Behavioral Scientist*, *8*(3), 8–14.
Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: An international comparison. *Journal of Financial Economics*, *69*, 505–527.

Lin, J. C., Singh, A. K., & Yu, W. (2009). Stock splits, trading continuity, and the cost of equity capital. *Journal of Financial Economics*, *93*, 474–489.
Litvak, K. (2008). Defensive management: Does the Sarbanes-Oxley Act discourage corporate risk-taking? University of Texas, Law and Economics Research Paper No. 108.
Liu, L. (2018). Where does multinational investment go with territorial taxation? Evidence from the UK. IMF Working Paper No. 18/7.
Lyon, J. K., & Maher, M. W. (2005). The importance of business risk in setting audit fees: Evidence from cases of client misconduct. *Journal of Accounting Research*, *43*, 133–151.
Lys, T., & Sohn, S. (1990). The association between revisions of financial analysts' earnings forecasts and security price changes. *Journal of Accounting and Economics*, *13*, 341–363.
Mukwiri, J. (2015). British law on corporate bribery. *Journal of Financial Crime*, *22*, 16–27.
Murphy, D. L., Shrieves, R. E., & Tibbs, S. L. (2009). Understanding the penalties associated with corporate misconduct: An empirical examination of earnings and risk. *Journal of Financial and Quantitative Analysis*, *44*, 55–83.
O'Hanlon, J., & Steele, A. (2000). Estimating the equity risk premium using accounting fundamentals. *Journal of Business Finance & Accounting*, *27*, 1051–1083.
Pagano, M., & Roell, A. (1996). Transparency and liquidity: A comparison of auction and dealer markets with informed trading. *The Journal of Finance*, *51*, 579–611.
Pagano, M., & Volpin, P. (2012). Securitization, transparency, and liquidity. *The Review of Financial Studies*, *25*, 2417–2453.
Roberts, M., & Whited, T. (2012). Endogeneity in empirical corporate finance. In G. Constantinides, M. Harris, & R. Stulz (Eds.), *Handbook of the economics of finance* (Vol. 2). Amsterdam: Elsevier.
Rose-Ackerman, S. (2004). Governance and corruption. In B. Lomborg (Ed.), *Global crises*, *global solutions* (pp. 301–362). Cambridge, UK: Cambridge University Press.
Sensson, J. (2005). Eight questions about corruption. *Journal of Economic Perspectives*, *19*(3), 19–42.
Serafeim, G. (2014). Firm competitiveness and detection of bribery. Harvard Business School Working Paper 14-012.
Shleifer, A., & Vishny, R. W. (1993). Corruption. *Quarterly Journal of Economics*, *108*, 599–617.
Smith, J. D. (2016). US political corruption and firm financial policies. *Journal of Financial Economics*, *121*, 350–367.
Trautman, L. J., & Altenbaumer-Price, K. (2013). Lawyers, guns, and money: The bribery problem and the UK Bribery Act. *International Lawyer*, *47*, 481–517.
Weissmann, A., & Smith, A. (2010). Restoring balance: Proposed amendments to the Foreign Corrupt Practices Act. Retrieved from https://www.instituteforlegalreform.com/research/restoring-balance-proposed-amendments-to-the-foreign-corrupt-practices-act.
Zeume, S. (2017). Bribes and firm value. *The Review of Financial Studies*, *30*, 1457–1489.

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APPENDIX A: DEFINITION OF VARIABLES

Variables	Definitions
Earnings Per Share (eps_t)	Net income available to common shareholder (net income before extraordinary items and after preferred dividends; Worldscope code WC01751) scaled by shares outstanding (WC05301)
Book Value Per Share (bps_t)	Book value of ordinary equity (WC03501) divided by shares outstanding (WC05301)
Stock Price (p_t)	Year-end close price (WC05001)
Bribery Act	Indicator variable = 1 when the observation year is greater than or equal to 2010 (after the UK Bribery Act 2010 passes), = 0 otherwise
Bribery Exposure	Indicator variable = 1 when *Segment CPI Score* is equal to or below the 25th percentile, = 0 otherwise

Variables	Definitions
Segment CPI Score	Sum-product of a firm's geographical segment sales and the geographical segment's Corruption Perception Index (CPI) score (reported by Transparency International), scaled by total sales. When the company reports consolidated sales at the continent level, the average CPI score is used. Geographic segment sales are obtained from WC19601, WC19611–WC19691 and the geographic segment regions are obtained from WC19600, WC19610–WC19690
Ln Market Capitalization	Natural logarithm of firm market capitalization (WC08001)
Book-to-Market	Book value of common equity (WC03501) scaled by market value of equity (WC08001)
Leverage	Total debt (WC03255) scaled by total assets (WC02999)
Cash Flow from Operations	Cash flow from operations (WC04860) scaled by total assets (WC02999)
Sales Growth	Sales (WC01001) from fiscal year t minus sales from fiscal year $t-1$ scaled by sales from fiscal year $t-1$.
Stock Return	Adjusted stock prices (DataStream code P#S) at year end of t minus stock price at $t-1$, scaled by stock price at $t-1$
Anti-Bribery Score	An index constructed as the sum of six indicator variables related to anti-bribery/corruption provisions provided by ASSET 4. ASSET4's anti-bribery data comprise six indicators, namely whether the company: (1) mentions a public commitment to anti-bribery/corruption at the senior management or board level; (2) strengthens anti-bribery/corruption in its code of conduct; (3) adopts an internal management tool for bribery/corruption such as hotlines or whistleblowing systems; (4) has a policy to cope with bribery/corruption in business transactions; (5) communicates on bribery-relevant issues with employees in organizational processes; and (6) conducts employee training on anti-bribery/corruption
Working Capital Ratio	Current assets (WC02201) scaled by current liability (WC03101)
Ownership Concentration	Proportion of equity held by shareholders with at least 5 percent of equity ownership within the firm (WC08021)
Bid-Ask Spread	Annual average of the daily closing ask price (Datastream code PA) less the closing bid price (Datastream code PB) scaled by the midpoint
Illiquidity	Annual average of daily ratio of absolute stock return to dollar trading volume (VO∗P#S)
Return Volatility	Annual standard deviation of daily stock returns
Trading Volume	Annual average of daily trading volumes (Datastream code VO)
Stock Turnover	Annual average of daily trading volumes (Datastream code VO) scaled by the number of free float shares outstanding (Datastream code FFNOSH)