Board Ethics and Auditor Choice – International Evidence

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ABSTRACT

This paper examines whether firms' auditor choice reflects the strength of board ethics. Based on a sample of 132,853 firm year observations from forty-six countries around the globe during the period between 1999-2007 and controlling for a number of firm-and country-level factors, we find that firms in countries where "high board ethical values" prevail are more likely to hire a Big 4 auditor. We also find that the positive effect of home country board ethical values on the likelihood of hiring a high-quality auditor is reinforced by the extent of the firm's board size. These results establish an indirect link between board ethics and financial reporting quality through the firms' choice of auditor.

Key words: *Ethics, board ethics, auditor quality, board size, corporate ethics.*

JEL classification: F23; G15; M41.

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1.0 Introduction

A firm's auditor choice decision is the outcome of a complex process involving a number of: (1) strategic considerations; (2) efficient contracting considerations; (3) lower information asymmetry considerations; (4) information risk considerations; and (5) financial considerations (Hribar, Kravet and Wilson, 2010; Francis, Khurana and Pereira, 2003; Francis, Maydew and Sparks, 1999; Fan and Wong, 2005; Datar, Feltham and Hughes, 1991 [respectively]). There is evidence that a higher quality audit results in (or is associated with) higher quality earnings, lower cost of capital and lower IPO under pricing (Titman and Trueman, 1986). However, Datar *et al.*'s (1991) cost-benefit consideration is open to question because a higher quality auditor, although nominally costly, may actually be cost-efficient.

In line with the above, it is plausible to expect firms to opt for higher quality auditors despite the expected fee premium. In the absence of moral hazard, it is rational to expect efficiency considerations to rule auditor choice. That means larger clients and clients with complex audits will have incentives to hire a superior quality auditor, while clients with inherent audit risks and those who stand to lose from the scrutiny of a reputed auditor will have incentives to opt for a less reputed auditor (Habib, 2011). This line of reasoning points to an ethical dimension of auditor choice, suggesting firms with higher ethical values will make an efficient choice and not an opportunistic one. However, it has not been empirically tested whether a firm's ethical values affect auditor choice. The decision will be based on whether the value derived from a superior quality auditor outweighs the cost (Cullinan, Du and Zheng, 2012).

Auditor choice, therefore, can be viewed as a self-regulatory mechanism instituted by a client to supplement corporate governance mechanisms in place within

the firm. Rezaee (2004), Fan and Wong (2005) and Choi and Wong (2007) find that the audit, in general, performs an important monitoring role in countries characterized by weak corporate governance. By choosing a higher quality auditor, a client, directly or indirectly, binds itself to higher standards of financial reporting and assurance qualities.

Bonding argument suggests that higher audit quality also acts as a supplement to the investor protection regime (or the lack of it) prevailing in the market in which the firm operates. While the choice is generally left to the client, there are instances of securities market oversight bodies attempting to regulate, or at least influence, auditor choice. For example, in France, large companies are required to hire at least two audit firms and once hired, auditors must be retained for 6 years. Similar examples can be found in Spain where a mandatory auditor rotation requirement was introduced in early 2000. Furthermore, the Sarbanes-Oxley Act enacted in 2002, requires the lead audit partner and the audit review partner to be rotated every five years in US public company audits (Daniels and Booker, 2011). Such instances present a scenario in which auditor choice is not permanent, and thus does not provide an appropriate determination of board ethics. Apart from these few instances, however, auditor choice can be viewed as a tool for self-regulation.

Prior research on the determinants of auditor choice "provides convincing evidence that, on average, audit quality increases with auditor size" (Hope et al., 2008, p. 358) and that "high-quality audits serve as a useful corporate governance mechanism by reducing information asymmetries and agency conflicts between the firm and its stockholders" (Hope et al., 2008, p. 358). We find as a result of our tests that firms are more likely to hire a Big 4 auditor if they have a highly ethical board and operate in an ethical environment. Furthermore, we investigate the association

between board ethical values and auditor choice to see if it is influenced by board size, and find that board size has a positive effect on this relationship.

This paper contributes to current literature by addressing the relationship between board ethics and auditor choice, which has not been studied previously. We utilise a large sample, consisting of 132,853 firm-years from 46 countries (from the World Economic Forum, 2008), which creates a rich basis for empirical review of this relationship, and creates globally applicable results. Furthermore, by controlling for other factors, we find there remains a strong association between the ethics of a firm's board and their choice of auditor.

The rest of the paper is organized as follows. Section 2 begins with a theoretical framework that outlines the expected influences on the auditor choice decision. Then, our hypotheses are developed on the basis of this conceptual framework. Section 3 describes the measures for the dependent, independent and control variables and the sample selection procedure. Section 4 presents our empirical results. Section 5 provides the conclusion.

2.0 Theoretical Framework and Hypothesis Development

"Ethics is primarily a communal, collective enterprise, not a solitary one," which flows through the firm, and into the public eye, as a result of the values instilled by the board (Azmi, 2006 p. 1). This is supported by former SEC Chairman Donaldson, who states that "the most important thing that a Board of Directors should do is to determine the elements that must be embedded in the company's moral DNA. It should be the foundation on which the board builds a corporate culture based on a philosophy of high ethical standards and accountability." (SEC Chairman, William H. Donaldson, 2003). Several academic studies suggest there are many benefits of acting

ethically, such as improved financial and non-financial firm performance (Verschoor, 1998), as well as the creation of a sustainable competitive advantage (Azmi, 2006).

According to the Statement of Auditing Standards (SAS) No. 78, "a code of ethics and ethical values are important elements of the internal control process of public companies," and although the failure of senior management to adhere to the values published in a firm's code of ethics is not in violation of the law, it may create a poor public perception of the firm (Pittman and Navran, 2003). Furthermore, recent actions from the Securities and Exchange Commission (SEC) suggest they may create a requirement for firms to disclose their core values, of which failure to adhere would be a violation of the SEC law (Pittman and Navran, 2003).

Auditing is a profession which is required due to the nature of the principal-agent relationship which exists in the corporate world, and the ease with which companies could otherwise exploit such a relationship (Salehi, 2010; Eilifsen and Messier, 2000). Such exploitation is prevalent where the interests of the principals and agents diverge, and leads to information asymmetry (Salehi, 2010). In order to minimise such divergences, principals must establish monitoring systems, of which the financial statement audit is arguably the most robust (Salehi, 2010). In this, the auditor provides "reasonable assurance that the financial statements are free from material misstatements" (Fernando *et al.*, 2010, as cited in Hajiha and Sobhani, 2012 p. 159).

Whilst financial statement audits are an invaluable control mechanism, not all audit firms have the same level of knowledge and expertise, and hence demand for auditing varies based on the quality of the auditor. The effectiveness of the audit varies with the quality of the auditor (Becker, DeFond, Jiambalvo and Subramanyam, 1998; Cullinan *et al.*, 2012). There is an observable economic effect, which results

from the employment of an audit firm with an average reputation (Cullinan *et al.*, 2012). For example, in grouping audit firms into three categories (Big 4, Second Tier and Third Tier), Cullinan *et al.,* (2012) show that although there is little negative market effect from a firm's switch from a Big 4 to Second Tier auditor, there is a large negative market effect when switching from a Big 4 to Third Tier auditor.

DeAngelo (1981) notes that, in order to assess audit quality, readers of the financial statements will have to make three judgements: (i) whether the amount and nature of audit work undertaken is appropriate for the particular client company; (ii) how technically competent the audit staff are to undertake the work properly; and (iii) how independent the audit firm is and hence how likely it is to report any unadjusted errors or omissions that it finds. To make these judgements the readers need to see the audit working papers and interview the key personnel involved in the audit (Moizer, 1997). Since this is impossible, an indirect way of assessing audit quality is whether auditors have been sued for failing to detect and/or report material misstatements. Thus, high quality auditors will be less willing to accept questionable accounting practices because if they do so, and later an audit failure is suspected, their reputational capital will suffer.

Consistent with the arguments above, Beatty (1989) reasons that Big 4 auditors are seen as more independent, thus providing a higher quality audit, due to their investment in reputational capital. Big 4 audits are perceived as being of the highest quality, due primarily to the large portfolio of well-known corporate clients who contract Big 4 auditors (Beatty, 1989). Furthermore, Big 4 auditors invest heavily in training facilities and programs to ensure their independence and the quality of their work (Beatty, 1989). It is also important to note there is a difference between an auditor discovering a financial discrepancy and actually reporting that discrepancy.

Khurana and Raman (2004, p. 475) state that "the ability to detect material error in the financial statements is a function of auditor competence, while the propensity to correct/reveal the material error is a function of auditor independence from the client."

Hope *et al.* (2008) suggest that poor ethical values lead to an increase in the prevalence of firms withholding important financial information, and thus the risk of auditors entering into a professional relationship with such firms increases. Therefore, intuitively, high quality auditors are more likely to accept clients operating in countries with high board ethical values (Feltham, Hughes and Simunic, 1991; Simunic and Stein, 1996). Simunic and Stein (1996) also suggest that audit quality decreases as the risk of firms withholding important information increases.

Therefore, we expect that boards with high ethical values will seek high quality audits by contracting a Big 4 auditor. This expectation also works vice versa, in that, as empirical evidence has shown, Big 4 auditors will generally only accept clients where the board exhibits high ethical values. Thus, our first hypothesis is:

H1: There is a positive association between the ethical values of a board and their selection (or non-selection) of a Big 4 auditor

H1 is our main hypothesis, as this paper seeks primarily to address the relationship between board ethics and auditor choice, and subsequently, auditor quality. However, numerous studies have indicated that larger boards have greater corporate governance, as larger boards are more likely to have a greater number of quality directors. DeAngelo (1981) and Datar *et al.* (1991) suggest that larger and more prestigious auditors and audit firms have greater incentives to provide a high quality audit, in order to protect their investment in reputational capital. Craswell, Francis and Taylor (1995) further argue that, although all audit firms must comply with certain standards, larger audit firms are more likely to voluntarily invest in

higher levels of expertise. If it is true that board ethical values affect auditor choice, then the effect of board size should be increased with the extent to which a particular firm is exposed to the behavior of board members. Similarly to what these studies suggest, we expect board ethics will be improved the greater the size of the board in a firm. Therefore, our second hypothesis is:

H2: There is a positive association between board size and board ethical values, and subsequently, a board's selection (or non-selection) of a Big 4 auditor

3.0 Research Design and Sample selection

3.1 Research Design

To test the effect of board ethics on auditor choice, we regress the Big 4 indicator variable on *ETHICS* (and a number of control variables). We estimate the following auditor choice regression model to test our first hypothesis:

$$BIG4 = \lambda_0 + \lambda_1\, ETHICS + \lambda_2\, INV\_PRO \text{ (or other country- level control variable)} + \lambda_3\, SIZE + \lambda_4\, LEV + \lambda_5\, ROE + \lambda_6\, CFO + \lambda_7\, LOSS + \lambda_8\, INVREC\_TA + \lambda_9\, SHORT + \lambda_{10}\, LONG + \text{fixed effects} \quad (1)$$

Equation 1 is based around the control variable, *BIG4*, which has the value of one (1) if a firm uses a Big 4 auditor, and zero (0) otherwise. Thus, the results would support H_1 if the coefficient on *ETHICS* is positive and significant. In the equation we also control for eight firm-level determinants, which are based on previous studies of St Pierre and Anderson (1984), Simunic and Stein (1987), Copley, Gaver and Gaver (1995), Choi and Wang (2007) and Hope *et al.* (2008). Further, we control for four country-level determinants, including investor protection.

The variable, *ETHICS*, is based on the corporate ethics index obtained from the World Economic Forum (2008). Scores recorded in this index take a value between one (1) and seven (7), with one indicating very poor corporate ethics, and

seven indicating very high corporate ethics. This measure is presented in Panel B of Table 3, with Finland, Sweden, Singapore and Norway exhibiting the highest results (6.63, 6.45, 6.30 and 6.18 respectively).

We use four country-level control variables: *INV_PRO*; *CAP*; *GDP*; and *OWN*, (Francis *et al.*, 1999; Francis *et al.*, 2003; Hope, 2003; Fan and Wong, 2005; Hope *et al.*, 2008). Perhaps the most important of these, investor protection (*INV_PRO*), is included to test whether firms in countries with strong investor protection are more likely to hire a Big 4 auditor. This measure is based on two proxies, obtained from World Bank (2008) data: *Reg* (regulatory quality) and *Law* (rule of law). *CAP* is a proxy which is included to control for the level of capital market development, measured as a ratio of stock market capitalisation to GDP, of which the data is obtained from the World Economic Forum (2008). We include a proxy, *GDP*, to control for the level of economic development in each country, based on the gross domestic product per capita, as obtained from the Central Intelligence Agency (CIA) factbook (2009). Finally, the proxy *OWN* is included to control for the ownership concentration of firms, and is based on the average share percentage owned by the three largest shareholders in the ten largest firms in each country, based on the findings of La Porta, Lopez-De-Silanes, Shleifer and Vishny (1998).

We also include eight firm-level control variables: *SIZE*, which is the firm size measured as the log of the current year's total assets; *SHORT* and *LONG*, the value of current year short term and long term accruals respectively; *INVREC_TA*, the current year end inventory and receivables as a percentage of total assets; *LEV*, leverage measured as the current year end total liabilities divided by total assets; *LOSS*, an indicative variable, with value one (1) if the firm incurs a net loss in the current year, and zero (0) otherwise; *CFO*, the cash flow from operations, deflated by lagged total

assets; and *ROE,* the current year's return on equity. All these variables (except for those which are dichotomous) are translated into US dollars, based on exchange rates for the 31st of December in each respective financial year. This is to avoid any discrepancies owing to the valuation of different currencies and natural yearly fluctuations of these values.

SIZE, SHORT, LONG and *INVREC_TA* are based on studies conducted by Simunic and Stein (1989), Francis *et al.* (1999) and Hope *et al.* (2008). These firm-level control variables are included, as they are indicators of audit quality, thus effecting auditor choice. *LEV* and *LOSS* are included based on the studies of Hope *et al.* (2008) and St Pierre and Anderson (1984). These variables relate to the risk incurred by auditors in relation to a firm's financial security. *CFO,* based on the study of Francis and Wang (2008), is included as the different premiums auditors charge will effect a firm's auditor choice, due to their desire to maintain high cashflows. *ROE* is included to address the potential effect of a firm's profitability on auditor choice.

Equation 1 also incorporates year-specific dummy variables and additional controls for omitted variables. We obtain sample statistics for empirical testing from 77 different industries, defined in the Global Industry Classification Standard (GICS), of which 'consumer services' has the largest portion (16.50%), followed by 'software and services' and 'chemicals' (10.89% and 8.90% respectively). These additional dummy variables and controls for omitted variables are not included in the tables for succinctness.

[Insert Table 1 here]

To test whether the board size (*BOD_SIZE*) impacts the effect of board ethical values, we use the firm's number of directors on the board. We then repeat Eq. (1)

but add *BOD_SIZE* as an interaction term with *ETHICS* (*ETHICS*BOD_SIZE*). We hypothesize that the coefficient on the interaction term will be positive.

3.2 Sample Selection

The financial statement data was extracted from the OSIRIS database[1] for the period 1998-2007. Following prior research (Francis and Wang, 2008; Hope *et al.*, 2008; Daske, Hail, Leuz and Verdi, 2008; Houqe *et al.*, 2012), we exclude financial service firms such as banks, insurance companies and other financial institutions because of the typical financial structure. We also exclude utility companies because they are regulated and therefore are likely to differ from other companies' operations. We exclude observations where the statements were not audited or where there were missing values for the dependent and independent variables under study. Finally we exclude observations that fall in the top and bottom 1% of firm level control variables, and those with the absolute value of Studentized residuals greater than 3. The trimming procedure produces our sample which consists of 132,853 firms-years for the period 1998-2007. The sample selection process is summarized in Table 2, and details of the sample and variables used in the tests are reported in Table 3.

[Insert Tables 2 and 3 here]

4.0 Empirical Results

4.1 Descriptive Statistics and Correlations

Firstly, we present the descriptive statistics and pair-wise correlations of the regression variables. The overall mean of *BIG4*, taken from Panel A of Table 3 is 0.53,

[1] Data of sample firms were collected from the OSIRIS (http://www.osiris.com) database when one of the authors worked at the School of Accounting and Business Information Systems, The Australia National University, Canberra, Australia.

indicating that 53% of sampled firms hire a Big 4 auditor. Panel A of Table 3 reports the pooled distribution of the firm-level regression variables. The mean board size is 8. The mean values of the control variables accord with expectations.

US firms are most heavily represented in the sample (n = 47,405), as indicated in Panel B of Table 3, followed by firms in Japan (n = 13,840) and South Korea (n = 9949). Nigeria (73), Venezuela (102), Colombia (134), and Kuwait (169) have the lowest number of observations. In order to address the issue of the sample size variations, we conduct a number of sensitivity analyses.

Norway has the highest Big 4 share (94%), followed by Finland (90%), Switzerland (90%) and Ireland (90%). China (10%), Egypt (24%), Indonesia (26%), and Philippines (31%) have the lowest Big 4 shares. In terms of the board ethics measures (*ETHICS*), Finland (6.63), Sweden (6.45), Singapore (6.30), Norway (6.18), and Switzerland (6.17) rank as the most ethical, while Russia (3.26), Venezuela (3.31), Argentina (3.46), Philippines (3.51), China (3.71), and Brazil (3.77) have the lowest ethical values. For the investor protection variable regulatory quality (REG), Hong Kong (1.95), Singapore (1.85), the UK (1.76), Ireland (1.75), Finland (1.70) and Australia (1.67) have the strongest regulatory quality as per the World Bank (2008) measure, whereas Venezuela (-1.35), Nigeria (-0.89), Argentina (-0.74), Viet Nam (-0.49), and Russia (-0.45) have the weakest regulatory quality. On the other hand for the investor protection variable rule of law (*LAW*), Norway (2.02), Switzerland (1.96), Sweden (1.86) and Finland (1.95) have the highest values while Venezuela (-1.39), Nigeria (-1.27), Pakistan (-0.82) and Peru (-0.75) have the lowest as per the World Bank (2008) measure. Hong Kong (713.26), Switzerland (280.20), South Africa (240.44) and Singapore (221.54) have the highest scores on the *CAP* index, while Venezuela (3.14) and Viet Nam (7.15) have the lowest scores. Colombia (68%),

Mexico (67%) and Brazil (63%) have the highest ownership concentration, whereas US (12%), Japan (13%), and the UK (15%), have the lowest ownership concentration.

[Insert Tables 4 here]

Table 4, shows the correlation among the pair-wise correlations of the regression variables. Not surprisingly the correlations are relatively high. However, there is no case with a variance inflation factor greater than 5, and thus collinearity is not a problem in this study. While the correlations are consistent with H_1, these results should be interpreted cautiously as they do not control for differences in firm characteristics or for country characteristics which may affect firms' auditor choices. Consequently, we now turn to the multivariate tests.

4.2 Multivariate Analysis

Based on Eq. (1)[2], we present six regression models including each of the country-level control variables in turn in Panel A of Table 5. Model 1 includes only firm-level control variables to ensure that any finding related to *ETHICS* is not sensative by included country-level control variables in the model. Models 2 - 6 add a control for country-level variables, the investor protection variables (*REG* and *LAW*), the level of capital market development (*CAP*), ownership concentration (*OWN*), and economic development (*GDP*). All regression models include year and country fixed effects. The (pseudo) *R* square of the models ranges from 0.359 to 0.409. Across all six models, *ETHICS* has a significant positive coefficient ($p<.01$), i.e., controlling for both firm- and country-level factors, the Big 4 auditor choice is significantly positively associated with the extent of board ethical values in the firm's country of domicile.

[2] The results are not sensitive to the alternative use of probit regressions.

Further evidence support that the effect of board ethical values is not sensative by the legal dimension variables *INV_PRO*, a measure of the capital market development *CAP*, ownership concentration (a proxy of agency costs) *OWN*, or a measure of the overall economic development of the country *GDP*. Therefore, we present that board ethical values have explanatory power on top of these country-level factors. All the country-level control variables are positively associated with Big 4 auditor choice. The firm-level control variables, *SIZE, LEV, ROE, CFO,* LOSS, and *LONG* are positively associated with Big 4 auditor choice, while *INVREC_TA* and *SHORT* are negatively related to Big 4 auditor choice.

[Insert Table 5 here]

To address sensitivity of the results towards countries that are more heavily represented in terms of observations, we deleting several countries which have very high numbers of observations. Panel B of Table 5 support that our results are robust even when deleting those countries from the regressions. As an additional analysis (for brevity the results are not reported), we reran Eq. (1) using a country-weighted Logit regression, where the weight is inversely proportional to the number of observations per country. Our results remained sensative. Finally, to ensure that fewer observations of smaller countries do not constrain the results, we reran the models deleting the smaller countries in the sample having 200 or less firm-year observations. The results are similar to the results reported in Tables 5 both in terms of the sign and statistical significance(for brevity the results are not reported). We thus conclude that smaller countries do not constrain the results.

The interaction between *ETHICS* and *BOD_SIZE* is positive and significant for all models reported in Panel A of Table 6. The positive effect of home country board ethical values on the likelihood of hiring a high-quality auditor is further

enhanced the larger the firm's board size. This result is in line with H_2. It also offers additional support for H_1, our key hypothesis that board ethics matters. Panel B of Table 6 supports that the results are sensative even when deleting countries with the largest number of observations.

[Insert Table 6 here]

In sum, these regression tests support our hypotheses that firms in high board ethical values countries are more likely to hire a Big 4 auditor, and that this relation is reinforced by firms' board size.

4.3 Robustness Tests

Supplementary to our controls for firm level determinents, we also control for the effects of the corporate tax rate. For example, if a Russian firm derives most of its revenues from operations in Europe or if the firm is cross-listed on the London Stock Exchange, the firm is less likely to be affected by domestic norms-such as the extent of low board ethical values in the country than other, less internationally-oriented, Russian firms. For this reason, we examine if the relation between ethics and auditor choice is reinforced by the degree of internationalization measured at the country level with the relevant tax rate as the proxy. The results are similar to the results reported in Table 5 both in terms of the sign and statistical significance of the test variables of interest (with Pseudo R^2 for all six models ranging from 0.370 to 0.418) and our conclusions were not affected (for brevity the results are not reported).

Secondly, we explored the effect of ranking the data obtained from the World Economic Forum (2008) for the *ETHICS* variable scores, rather than simply using the raw scores. For example, although nominally one score may be only slightly higher than another, the real difference comparably with this variable may be large in comparison to the rest of the sample scores. We obtain virtually the same results in

ranking these scores as for found simply using the raw scores (Pseudo R^2 for all six models ranging from 0.316 to 0.418; again, for brevity, the results are not reported).

Following Kaplan's (2001) test of MBA student perceptions of corporate ethics (company-benefiting actions versus personal-benefiting actions) we also measured board ethics as 'individualism', Hofstede's (2001) second cultural dimension. We thus repeat the above tests using this alternative measure of board ethics. Our (unreported) results show that the board ethics measure retains its significance at less than the 0.01 level, alleviating any potential concerns that our results are specific to the choice of measure for the variable *ETHICS*.

5.0 Conclusion

As the first study to empirically test the relationship between board ethics and auditor choice, this study is an important addition to existing corporate governance literature. Also, due to the large sample size, our findings are applicable to firms worldwide. This study tests whether the strength of a firm's board ethics relates positively to the firm's choice of a high-quality (Big 4) auditor.

We hypothesise, firstly, that a positive relationship will exist between board ethics and a firms selection (or non-selection) of a Big 4 auditor. We find support for this hypothesis through a large sample of firms taken from 46 countries worldwide. Furthermore, we test the relationship between board size and board ethics (and subsequently the selection or non-selection of a Big 4 auditor), hypothesizing a positive relationship. We also find evidence affirming this hypothesis through our large sample size.

It is important to note that in testing the association between board ethics and auditor choice, we are not attempting to ascertain whether a causal relationship exists, but simply whether a positive relationship exists, as was addressed in Hope *et al.*'s

(2008) study. Despite this caveat, it appears through our empirical testing that, to some extent, board ethics have an influence on a firm's choice of auditor (Baumhart, 1961; Victor and Cullen, 1988; Trevino, Butterfield and McCabe, 1998; Sims and Keenan, 1998; Hunt, Wood and Chonko, 1989; Kaplan, 2001; Valentine, Young, Bailey, Barhoum, LaBure, Glover and Isaac, 2001; Madison, 2002; Vitell, Bakir, Paolillo, Hidalgo, Al-Khatib and Rawwas, 2003; Elias, 2004).

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Table 1: Descriptions of variables

Variable	Measure	Description	Data Source
Dependent variable			
BIG4	Auditor Quality	Dummy variable with the value of 1 if the firm is audited by one of the Big 4 auditors and otherwise 0.	OSIRIS (2009)
Independent variables			
Investor Protection (INV_PRO)	Regulatory Quality (REG)	Measures the ability of the government to formulate and implement sound policies and regulations and promote private sector development.	The World Bank (2008)
	Rule of Law (LAW)	Measures the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence.	The World Bank (2008)
Capital Market development	Stock market capitalization to GDP (CAP)	Stock market capitalization to GDP index. This indicator is the value of listed shares as a percentage of GDP.	The World Economic Forum (2008)
Economic Development	GDP	Gross domestic product per capita in US dollars	CIA Factbook (2009)

Ownership Concentration	OWN	The average percentage of common shares owned by the three largest shareholders in the 10 largest firms in a given country.	La Porta *et al.*, (1998)
Control Variables	SIZE	Log of firm total assets	OSIRIS (2009)
	LEV	Total long-term debt/Total Assets	OSIRIS (2009)
	ROE	Net profit / Common shareholders' equity	OSIRIS (2009)
	CFO	Cash flow from operations	OSIRIS (2009)
	LOSS	Takes the value 1 if Net income for the period is negative and 0 otherwise.	OSIRIS (2009)
	INVREC_TA	(Current year inventory + current year Receivable) / Total assets	OSIRIS (2009)
	SHORT	Current Accruals scaled by beginning year total assets	OSIRIS (2009)
	LONG	Long term Accruals scaled by beginning year total assets	OSIRIS (2009)

Table 2
Sample selection

Total number of observations for 1998-2007 without Missing values on dependent an independent variables	212,950
Less: Observations from countries not in the list of the WEF report (2008)	(46,298)
Less: Financial Institution and regulated firms	(20,522)
Less: Top and bottom 1% of DACCR accruals	(11,107)
Less: Observations with |Studentized residuals|>3	(4,425)
Number of observations used in the tests	**132,853**

Table 3
Descriptive Statistics

Panel A : Descriptive statistics for firm-level regression variables

	Mean	Std. Dev.	1st Quartile	Median	3rd Quartile
BIG4	0.53	0.499	0.000	1.00	1.000
BOD_SIZE	8.00	5.598	5.00	8.00	12.00
SIZE	5.1092	.88551	4.4922	5.0923	5.710
LEV	0.6017	0.25037	0.4890	0.6432	0.7718
SHORT	-0.0678	0.20902	-0.1214	-0.0440	0.0189
LONG	0.0469	0.04723	0.0169	0.0353	0.0596
INVREC_TA	0.1320	0.11832	0.0343	0.1046	0.1948
ROE	0.1541	0.9687	-0.0310	0.0864	0.1865
CFO	0.0325	0.19752	-0.0136	0.0561	0.1239
LOSS	0.31	0.462	0.000	0.0000	1.000

Table 3

Panel B: Summary of country-level variables

Country	*No.of obs.*	*BIG4 (%)*	*ETHICS*	*INV_PRO*		*CAP*	*GDP*	*OWN*
				REG	**LAW**			
Australia	3613	59	6.08	1.67	1.81	118.28	38100	0.28
Argentina	616	65	3.46	-0.74	-0.58	29.73	14200	0.55
Austria	317	62	6.09	1.53	1.87	48.32	39200	0.51
Belgium	629	53	5.40	1.32	1.45	85.53	37500	0.62
Brazil	2472	66	3.77	0.00	-0.48	53.28	10100	0.63
Canada	6022	75	5.86	1.53	1.85	123.28	39300	0.24
Chile	1867	80	5.46	1.41	1.15	103.50	14900	0.38
China	7148	10	3.71	-0.19	-0.40	n.a	6000	n.a
Colombia	134	33	4.43	0.10	-0.64	32.13	8900	0.68
Czech Republic	364	46	3.95	0.95	0.73	29.94	26100	n.a
Egypt	1971	24	4.34	-0.44	0.00	74.58	5400	0.62
Finland	639	90	6.63	1.70	1.95	111.15	37200	0.24
France	3730	59	5.42	1.12	1.37	91.82	32700	0.34
Germany	2751	55	6.15	1.39	1.77	48.37	34800	0.50
Hong Kong	876	81	5.82	1.95	1.45	713.26	43800	0.54
India	6587	38	4.19	-0.15	0.17	70.64	2800	0.43
Indonesia	1313	26	3.77	-0.26	-0.82	26.52	3900	0.62
Ireland	263	90	5.53	1.75	1.62	60.63	46200	0.36
Israel	1107	40	4.88	0.91	0.69	103.12	28200	0.55
Italy	1252	86	4.08	0.84	0.37	48.42	31000	0.60
Japan	13840	73	5.41	1.27	1.40	108.27	34200	0.13
Korea South	9949	36	5.16	0.70	0.72	86.08	26000	0.20
Kuwait	169	53	4.72	0.51	0.75	153.89	57400	n.a
Malaysia	4433	60	5.26	0.67	0.58	133.89	15300	0.52
Mexico	1063	72	4.35	0.43	-0.49	33.54	14200	0.67
Netherlands	848	86	6.15	1.65	1.75	102.90	40300	0.31
Nigeria	73	66	3.79	-0.89	-1.27	21.33	2300	0.45
Norway	870	94	6.18	1.34	2.02	69.04	55200	0.31
Pakistan	946	45	4.35	-0.39	-0.82	33.62	2600	0.41
Peru	551	55	3.99	0.11	-0.75	51.03	8400	0.57
Philippines	796	31	3.51	-0.06	-0.48	43.61	3300	0.51
Poland	201	47	4.17	0.64	0.25	35.52	17300	n.a
Russia	453	56	3.26	-0.45	-0.91	74.51	15800	n.a
Singapore	2619	71	6.30	1.85	1.82	221.54	52000	0.53
Saudi Arabia	397	55	4.43	-0.02	0.17	136.54	20700	n.a
South Africa	1106	70	4.68	0.68	0.24	240.44	10000	0.52
Spain	753	86	4.87	1.06	1.10	90.04	34600	0.50
Sweden	1762	86	6.45	1.44	1.86	125.47	38500	0.28
Switzerland	754	90	6.17	1.45	1.96	280.20	40900	0.48
Thailand	2018	72	4.14	0.37	0.03	62.12	8500	0.48
Turkey	345	32	4.64	0.21	0.08	36.52	12000	0.50
UAE	189	74	5.30	0.80	0.67	n.a	40000	n.a
UK	6461	63	5.83	1.76	1.73	139.22	36600	0.15

USA	47405	61	5.10	1.47	1.57	135.37	47000	0.12
Venezuela	102	88	3.31	-1.35	-1.39	3.14	13500	0.49
Viet Nam	419	38	4.03	-0.49	-0.43	7.15	2800	n.a

BIG4 = dummy variable, = 1 if firm i is audited by a Big 4 auditor in year t, 0 otherwise. ***ETHICS*** = index of Corporate Ethics (WEF 2008). ***INV_PRO*** is Investor Protection, measured two ways: (1) ***REG*** = Regulatory quality index (The World Bank 2008). (2) ***LAW*** = Rule of Law index (The World Bank 2008). ***CAP*** = Stock market capitalization to GDP index (WEF 2008). ***GDP*** = Gross domestic product per capita in US dollars. (CIA Factbook 2009). ***OWN*** = the average percentage of common shares owned by the three largest shareholders in the 10 largest firms in a given country (La Porta *et al.,* 1998). ***SIZE*** =natural logarithm of total assets in $ thousands for firm i in year t. ***LEV***= total liabilities / total assets for firm i in year t. ***ROE***= return on common equity in year t. ***CFO*** = operating cash flows for firm i in year t scaled by lagged total assets. ***LOSS*** = dummy variable, = 1 if firm i reports negative net income in the current year and 0 otherwise. ***INVREC_TA*** **=** current year end inventory and receivables as a percentage of total assets. ***SHORT*** **=** current year short term accruals. ***LONG*** **=** current year long term accruals.

Table 4
Pearson correlation matrix

	BIG4	***ETHICS***	***REG***	***LAW***	***CAP***	***GDP***	***OWN***	***ETHICS*BOD_SIZE***
ETHICS	0.284**	1						
	(<.01)							
REG	0.349**	0.802**	1					
	(<.01)	(<.01)						
LAW	0.322**	0.851**	0.956**	1				
	(<.01)	(<.01)	(<.01)					
CAP	0.169**	0.381**	0.470**	0.416**	1			
	(<.01)	(<.01)	(<.01)	(<.01)				
GDP	0.314**	0.658**	0.917**	0.903**	0.437**	1		
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)			
OWN	-0.091**	-0.319**	-0.603**	-0.665**	-0.151**	-0.695**	1	
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)		
ETHICS*BOD_SIZE	0.234**	0.283**	0.283**	0.293**	0.178**	0.274**	-0.0130**	1
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	

Note: p-values are in parenthesis**.**

BIG4 = dummy variable, = 1 if firm i is audited by a Big 4 auditor in year t, 0 otherwise. ***ETHICS*** = index of Corporate Ethics (WEF 2008). ***REG*** = Regulatory quality index (The World Bank 2008). ***LAW*** = Rule of Law index (The World Bank 2008). ***CAP*** = Stock market capitalization to GDP index (WEF 2008). ***GDP*** = Gross domestic product per capita in US dollars. (CIA Factbook, 2009). ***OWN*** = the average percentage of common shares owned by the three largest shareholders in the 10 largest firms in a given country (La Porta *et al.,* 1998). ***ETHICS*BOD_SIZE*** = the interaction of board ethical values with board size.

Table 5
Logit regressions testing the relation between auditor choice (BIG4) and Board Ethics

BIG4 = λ_0 + λ_1 Ethics + λ_2 INV_PRO (or other country- level control variable) + λ_3 SIZE + λ_4 LEV + λ_5 GROWTH + λ_6 CFO + λ_7 LOSS + λ_8 INV_TA + λ_9 SHORT + λ_{10} LONG + Fixed effects

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Panel A : Logit regressions for pooled sample						
ETHICS	**0.101**	**0.127**	**0.197**	**0.154**	**0.175**	**0.151**
	(<.01)	**(<.01)**	**(<.01)**	**(<.01)**	**(<.01)**	**(<.01)**
REG		0.854				
		(<.01)				
LAW			0.610			
			(<.01)			
CAP				0.005		
				(<.01)		
GDP					0.0001	
					(<.01)	
OWN						0.789
						(<.01)
SIZE	1.401	1.341	1.328	1.421	1.277	1.213
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
LEV	0.570	0.450	0.475	0.412	0.501	0.514
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
ROE	0.021	0.022	0.018	0.019	0.019	0.018
	(0.058)	(0.051)	(0.101)	(0.100)	(0.101)	(0.111)
CFO	0.115	0.272	0.212	0.020	0.210	-0.050
	(0.051)	(<.01)	(<.01)	(0.765)	(0.042)	(.454)
LOSS	0.034	0.125	0.089	0.089	0.078	0.076
	(.088)	(<.01)	(.055)	(<.01)	(.049)	(<.01)
INVREC_TA	-0.245	-0.421	-0.415	-0.134	-0.325	-0.168
	(<.01)	(<.01)	(<.01)	(.092)	(<.01)	(.045)
SHORT	-0.399	-0.492	-0.500	-0.212	-0.514	-0.101
	(<.01)	(<.01)	(<.01)	(.058)	(<.01)	(0.221)
LONG	5.643	5.212	5.404	5.157	1.420	1.820
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
Intercept	-10.114	-9.115	-9.528	-9.876	-9.521	-9.568
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
fixed effects	included	included	included	included	included	included
Pseudo R^2	**0.395**	**0.408**	**0.409**	**0.3769**	**0.399**	**0.359**
N	**132,853**	**132,853**	**132,853**	**132,853**	**132,853**	**132,853**

	Without USA	**Without UK**	**Without Canada**	**Without India**	**Without Japan**	**Without USA, UK, Canada, India, Japan**
Panel B : Logit regressions for sub-sample excluding selected countries						
ETHICS	**0.100**	**0.124**	**0.154**	**0.124**	**0.101**	**0.105**
	(<.01)	**(<.01)**	**(<.01)**	**(<.01)**	**(<.01)**	**(<.01)**
SIZE	1.110	1.205	1.214	1.147	1.254	1.115
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
LEV	0.316	0.516	0.501	0.610	0.601	0.598
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
ROE	0.104	0.084	0.120	0.099	0.068	0.125

	(<.01)	(<.01)	(<.01)	(<.01)	(0.089)	(<.01)
CFO	0.240	0.118	0.123	0.165	0.073	0.502
	(<.01)	(0.055)	(0.028)	(0.058)	(0.255)	(<.01)
LOSS	0.050	0.048	0.071	0.046	0.064	0.121
	(.051)	(0.145)	(0.025)	(0.150)	(0.058)	(<.01)
INVREC_TA	-0.343	-0.315	-0.300	-0.205	0.034	-0.185
	(<.01)	(<.01)	(<.01)	(0.058)	(0.546)	(0.085)
SHORT	-0.942	-0.425	-0.401	-0.421	-0.444	-0.845
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
LONG	5.456	6.100	6.215	6.258	6.127	9.214
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
Intercept	-9.815	-10.215	-10.698	-10.156	-9.214	-10.214
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
fixed effects	included	included	included	included	included	included
Pseudo R^2	**0.360**	**0.389**	**0.389**	**0.356**	**0.412**	**0.329**

Note: Coefficient p-values are two-tail and based on asymptotic Z-statistic robust to hetroscedasticity and country clustering effects using the method in Rogers (1993). For clarity in presentation the coefficients on year and country dummies have not been reported.

BIG4 = dummy variable, = 1 if firm i is audited by a Big 4 auditor in year t, 0 otherwise. ***ETHICS*** = index of Corporate Ethics (WEF 2008). ***ETHICS*BOD_SIZE*** = the interaction of board ethical values with board size. ***INV_PRO*** is Investor Protection, measured two ways: (1) ***REG*** = Regulatory quality index (The World Bank 2008). (2) ***LAW*** = Rule of Law index (The World Bank 2008). ***CAP*** = Stock market capitalization to GDP index (WEF 2008). ***GDP*** = Gross domestic product per capita in US dollars. (CIA Factbook 2009). ***OWN*** = the average percentage of common shares owned by the three largest shareholders in the 10 largest firms in a given country (La Porta *et al.*, 1998). ***SIZE*** =natural logarithm of total assets in $ thousands for firm i in year t. ***LEV***= total liabilities / total assets for firm i in year t. ***ROE*** = return on common equity in year t. ***CFO*** = operating cash flows for firm i in year t scaled by lagged total assets. ***LOSS*** = dummy variable, = 1 if firm i reports negative net income in the current year and 0 otherwise. ***INVREC_TA*** **=** current year end inventory and receivables as a percentage of total assets. ***SHORT*** **=** current year short term accruals. ***LONG*** **=** current year long term accruals.

Table 6

Logit regressions testing interaction between board ethics (Ethics) and Board Size (BOD_SIZE) in explaining auditor choice (BIG4)

BIG4 = λ_0 + λ_1 Ethics + λ_2 BOD_SIZE + + λ_3 Ethics*BOD_SIZE + λ_4 INV_PRO (or other country- level control variable) + λ_5 SIZE + λ_6 LEV + λ_7 GROWTH + λ_8 CFO + λ_9 LOSS + λ_{10} INV_TA + λ_{11} SHORT + λ_{12} LONG + fixed effects

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Panel A : Logit regressions for pooled sample						
ETHICS	**0.111**	**0.134**	**0.213**	**0.187**	**0.141**	**0.279**
	(<.01)	**(<.01)**	**(<.01)**	**(<.01)**	**(<.01)**	**(<.01)**
ETHICS*BOD_SIZE	**0.452**	**0.265**	**0.425**	**0.215**	**0.549**	**0.439**
	(<.01)	**(<.01)**	**(<.01)**	**(<.01)**	**(.012)**	**(<.01)**
REG		0.865				
		(<.01)				
LAW			0.596			
			(<.01)			
CAP				0.016		
				(<.01)		
GDP					0.045	
					(<.01)	
OWN						0.877
						(<.01)
SIZE	1.359	1.091	1.258	1.524	1.248	1.567
	(<.01)	(0.08)	(0.02)	(<.01)	(0.03)	(<.01)
LEV	0.610	0.504	0.500	0.507	0.542	0.528
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
ROE	0.100	0.089	0.089	0.098	0.101	0.098
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
CFO	0.225	0.305	0.300	0.151	0.255	0.075
	(<.01)	(<.01)	(<.01)	(.033)	(<.01)	(.302)
LOSS	0.042	.0112	0.063	0.112	0.071	0.107
	(0.069)	(<.01)	(0.005)	(<.01)	(0.006)	(<.01)
INVREC_TA	-0.253	-0.421	-0.400	-0.087	-0.478	-0.118
	(<.01)	(<.01)	(<.01)	(.384)	(<.01)	(.088)
SHORT	-0.427	-0.504	-0.500	-0.247	-0.497	-0.141
	(<.01)	(<.01)	(<.01)	(.001)	(<.01)	(.065)
LONG	6.005	5.120	6.003	6.259	6.457	5.245
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
Intercept	-9.014	-8.123	-7.668	-8.238	-10.001	-9.129
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
fixed effects	included	included	included	included	included	included
Pseudo R^2	**0.398**	**0.418**	**0.389**	**0.379**	**0.398**	**0.379**
N	**132,853**	**132,853**	**132,853**	**132,853**	**132,853**	**132,853**
	Without USA	**Without UK**	**Without Canada**	**Without India**	**Without Japan**	**Without USA, UK, Canada, India, Japan**
Panel B : Logit regressions for sub-sample excluding selected countries						
ETHICS	0.101	0.154	0.121	0.167	0.144	0.123
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
*ETHICS*BOD_SIZE*	0.352	0.342	0.152	0.312	0.252	0.145
	(<.01)	(<.01)	(0.165)	(.028)	(<.01)	(.101)
SIZE	1.225	1.420	1.624	1.567	1.495	1.215

	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
LEV	0.401	0.558	0.514	0.654	0.614	0.589
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
ROE	-0.154	-0.078	-0.109	-0.101	-0.089	-0.142
	(<.01)	(0.065)	(<.01)	(<.01)	(0.051)	(<.01)
CFO	0.445	0.214	0.200	0.211	0.125	0.642
	(<.01)	(<.01)	(<.01)	(<.01)	(.068)	(<.01)
LOSS	0.029	0.028	0.069	0.036	0.054	0.125
	(0.258)	(0.199)	(0.011)	(0.143)	(0.021)	(<.01)
INVREC_TA	-.0321	-0.314	-0.325	-0.254	-0.039	0.007
	(<.01)	(<.01)	(<.01)	(0.081)	(0.589)	(0.989)
SHORT	-0.900	-0.504	-0.524	-0.504	-0.521	-1.101
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
LONG	9.125	6.126	6.425	6.132	6.180	9.678
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
Intercept	-9.141	-9.121	-9.560	-10.112	-10.167	-10.117
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
fixed effects	included	included	included	included	Included	included
Pseudo R^2	**0.360**	**0.389**	**0.359**	**0.348**	**0.369**	**0.339**

Note: Coefficient p-values are two-tail and based on asymptotic Z-statistic robust to hetroscedasticity and country clustering effects using the method in Rogers (1993). For clarity in presentation the coefficients on year and country dummies have not been reported.

BIG4 = dummy variable, = 1 if firm i is audited by a Big 4 auditor in year t, 0 otherwise. ***ETHICS*** = index of Corporate Ethics (WEF 2008). ***ETHICS*BOD_SIZE*** = the interaction of board ethical values with board size. ***INV_PRO*** is Investor Protection, measured two ways: (1) ***REG*** = Regulatory quality index (The World Bank 2008). (2) ***LAW*** = Rule of Law index (The World Bank 2008). ***CAP*** = Stock market capitalization to GDP index (WEF 2008). ***GDP*** = Gross domestic product per capita in US dollars. (CIA Factbook 2009). ***OWN*** = the average percentage of common shares owned by the three largest shareholders in the 10 largest firms in a given country (La Porta *et al.*, 1998). ***SIZE*** =natural logarithm of total assets in $ thousands for firm i in year t. ***LEV***= total liabilities / total assets for firm i in year t. ***ROE*** = Return on common equity in year t. ***CFO*** = operating cash flows for firm i in year t scaled by lagged total assets. ***LOSS*** = dummy variable, = 1 if firm i reports negative net income in the current year and 0 otherwise. ***INVREC_TA*** **=** current year end inventory and receivables as a percentage of total assets. ***SHORT*** **=** current year short term accruals. ***LONG*** **=** current year long term accruals.