Joint Audit and Cost of Equity Capital:

Evidence from Saudi Arabia

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SUMMARY: Article 14 of the Saudi banking control law (1966) and article 10 of the Saudi cooperative insurance companies control law (2003) state that auditing by two independent auditors is mandatory for banks and insurance companies. These joint audit regulations aimed at improving the independence of the auditor. In accordance with article 130 of the Saudi companies' law, few Saudi listed firms in recent years, other than firms in the banking and insurance industries, have voluntarily appointed two independent auditors. We examine whether Saudi investors require a lower rate of return for investing in firms with two independent auditors as opposed to firms with a single auditor, and whether the rate varies by the effect of the mandatory versus voluntary settings, and by audit quality of the two appointed auditors (Big 4 vs Non Big4). Our main results suggest that the expected cost of equity and the implied cost of equity, our proxies of the required rate of return, are decreasing in firms with two independent auditors as opposed to firms with a single auditor, and that this finding is driven primarily by the sample of firms that are subject to mandatory regulations. The results of the additional analyses suggest that investors' perception of the joint audit has been significantly alleviated if one of the two appointed auditors is a non-big 4 auditor.

Keywords: Joint Audit, Single Audit, Auditor Independence, Information Risk, Cost of Equity.

Data Availability: Data are available from sources identified in the text.

INTRODUCTION

The primary objective of our study is to examine whether market participants are pricing the joint audit regulations in the Saudi market. Under Article 14 of the Saudi banking control law (BCL 1966) and Article 10 of the Saudi cooperative insurance companies control law (CICCL 2003), and Article 130 of the Saudi companies' law (CL 1965), auditing by two independent auditors is mandatory for banks and insurance companies, and voluntary for other companies in different industries. The proponents of joint audit regulations believe that buying off two independent auditors is costly for the firm, arguing that a co-signed audit report enhances investors' faith in the credibility of financial information, and thus can be served as an important signal of auditor independence.

While single audit requirements are still the norm in many countries around the world, with the U.S, Canada and Australia being notable examples; various countries such as France, Denmark, Switzerland, U.K, Germany, India and Kuwait has either mandated or proposed voluntary joint audit regulations.

Prior studies investigate on the overall effect of joint audit regulations and provide mixed evidence. A stream of research documents that joint audit is not able to constrain earnings management practices (Holm and Thinggaard 2010; Lesage, Ratzinger-Sakel, and Kettunen 2012), nor has any effect on earnings quality (Aljabr and Alsadoun 2013), and may result in lower total audit evidence precision (Deng et al. 2012). Another stream of research, however, document that joint audit firms opting voluntarily for joint audit have a higher degree of earnings conservatism, and lower abnormal accruals (Zerni et al. 2012), and the lower abnormal accruals is even stronger for firms that use two big 4 auditors (Francis, Richard, and Vanstraelen 2009), and achieve higher auditor's report consensus and greater accuracy (Baldauf and Steckel 2012).

The above studies have devoted much attention towards investigating the impact of joint audit on financial reporting and audit quality. What these studies do not show, however, is the investors' perception of the joint audit regulations. Accordingly, the primary purpose of our study is to examine Saudi investors' pricing of joint audit regulations, as reflected by the cost of equity capital. We conjecture that if joint audit regulations enhance auditor independence, then this in turn decreases the information asymmetry between the firm and investors, all of which to require a lower rate of return for the decreased information risk.

Based on all available firm-year observations during 2007–2010, our main results indicate a negative association between both, the expected and the implied cost of equity measures, and the joint audit indicator variable, where the expected cost of equity measure is estimated by applying the capital assets pricing model (CAPM), and the implied cost of equity measure which is based on the average of five individual implied cost of equity measures. These findings suggests that despite prior studies that find no impact for joint audit on earnings and audit quality, investors perceive lower information risk in firms with two independent auditors.

The results from additional tests indicate that our results are consistent across all of the five individual implied cost of equity measures. Furthermore, additional tests indicate that the negative association between cost of equity measures and the joint audit variable is driven primarily by the sample of firms that are subject to mandatory regulations compared to the sample of firms opting voluntarily for joint audit, and that investors' require even lower cost of equity for firms with two Big 4 auditors conducting the joint audit as opposed to firms with one big 4 auditor paired with a non-big 4 auditor. Our main findings remain robust after clustering the standard errors by firm and controlling for industry dummies.

While the small sample size of our study, due to the small Saudi market, seems to be the main limitation, our findings are interesting and contribute to the literature in several ways. First, we offer new insight on the usefulness to investors and contribute to the debate by examining the impact of joint audit on the cost of equity capital of firms following regulations. Second, we add to the scant literature on how investors perceive joint audit requirements.

The next section of our study provides the background and discusses related research. We then briefly describe the research design and sample, followed by a discussion of results of primary tests and results of additional tests. The paper ends with conclusions.

BACKGROUND AND RELATED LITERATURE

Auditing in Saudi Arabia

The audit market for listed companies in Saudi Arabia is monitored by the Saudi organization of certified public accountants (SOCPA), and remarkably dominated by the international Big 4 accounting firms (i.e., KPMG, Ernst & Young, PricewaterhouseCoopers, and Deloitte). The regulations enacted in Saudi Arabia require all firms listed in the banking and insurance sectors to appoint two independent auditors which are jointly responsible for the audit opinion. Specifically, Article 14 of the Saudi banking control law states that "every bank shall appoint annually two auditors from amongst the approved list of auditors registered with the Ministry of Commerce and Industry" (BCL 1966), and Article 10 of the Saudi cooperative insurance companies control law state that "the general assembly of the insurance or re-insurance company shall annually appoint two auditing offices from among the certified accountants licensed to practice the profession in the Kingdom and shall determine their fees" (CICCL 2003). On the other hand, Article 130 of the Saudi companies' law suggests that other firms in different industries could voluntarily appoint two independent auditors. It states that "the ordinary general assembly shall appoint an auditor or more, of the observers authorized to work in the Kingdom, and determine their remuneration and the duration of their work" (CL 1965). Regulators in Saudi has long held the view that joint audit requirements enhance auditor independence and contributes towards investors' confidence in financial reporting credibility.

Prior Research

The issue of auditor independence has attracted considerable regulatory and academic interest worldwide. Given that external auditing serves as a monitoring device (Cohen, Krishnamoorthy, and Wright 2004), auditor independence is vital in maintaining public confidence in capital markets and the integrity of corporate financial statements (Kanagaretnam, Krishnan, and Lobo 2010). A loss of auditor independence can manifest as lower quality financial reports (Frankel, Johnson, and Nelson 2002; Krishnan, Sami, and Yinqi 2005), and higher cost of debt (Dhaliwal et al. 2008). As noted by Levitt (2000), it is not sufficient for auditors to be independent; rather investors must perceive the auditor to be independent. Given that auditor independence is unobservable, a common approach of assessing independence is to rely on signals that make an audit firm economically independent (Kinney, Palmrose, and Scholz 2004). One such signal that can be used by investors to assess the level of independence is the joint audit regulation.

While prior research on both voluntary and mandatory joint audit settings has devoted much attention towards investigating the impact of joint audit on financial reporting and audit quality, the evidence from these studies is decidedly mixed. Several studies have analyzed the effect joint audit regulations might have on audit quality. In the Danish settings, Holm and Thinggaard (2010) investigate whether joint audit impacts audit quality proxied by abnormal accruals and document, with a final sample of 117 firms for the 2003-2007 period, that joint audit is not better able to constrain earnings management than a single audit. Another study in the Danish settings by Lesage et al. (2012) confirm the previous study and find that joint audits do not have an impact on audit quality, as proxied by the level of abnormal accruals. In this context, a study by Aljabr and Alsadoun (2013) in the Saudi settings examines the effects of joint audit on earnings quality, proxied by earnings persistence, of the Saudi publicly listed companies, and their main findings document that joint audit has no effect on earnings quality in general. In an investigative approach, Deng et al.(2012) examine the consequences of joint audit in France on two aspects of audit quality, both audit independence and audit evidence precision. Their main findings suggest that joint audit may compromise auditor independence as it gives clients the opportunity for "opinion shopping"[1], and that audit quality may be impaired since a free-rider problem (i.e. one auditor relies on the other auditor's work) would prevail and result in lower total audit evidence precision.

In contrast, Zerni et al. (2012) in the Swedish settings for the 2001 to 2007 period examine the impact of the voluntary joint audit on audit quality. They document that firms opting voluntarily for joint audit have a higher degree of earnings conservatism, and lower abnormal accruals. Baldauf and Steckel (2012) examines the effects of a joint audit on auditor's report consensus and accuracy, and document evidence that auditors who use a joint audit approach achieve higher consensus and greater accuracy. Another paper in the French settings conducted by Francis et al. (2009) study if a firm's ownership structure affects its auditor-pair choice as well the consequences on earning quality. Their findings are consistent with agency theory and indicate that a Big 4 auditor (paired with a non-Big 4 auditor) is more likely to be used when there is greater information asymmetry (less family control and more diversified ownership structures), and that these associations are even stronger for firms with two Big 4 auditors conducting the joint audit. They also document that firms using one Big 4 auditor (paired with a non-Big 4 auditor) have smaller income-increasing abnormal accruals

[1] They argue that the competition between the two auditors creates incentives to 'please' the client.

compared to firms that use no Big 4 auditors and find that this effect is even stronger for firms that use two Big 4 auditors.

In this study, we evaluate investors' perception of the joint audit requirements by investigating the relationship between the cost of equity capital and joint audit. We agree with the view that without effective controls and monitoring, rational investors will price-protect themselves by effectively increasing cost of equity capital. This view is also consistent with those of recent studies indicating that investors demand higher compensation for investing in securities with greater uncertainty surrounding financial reporting credibility (e.g., Easley and O'Hara 2004; Lambert, Leuz, and Verrecchia 2007; Ecker et al. 2006).

We conjecture in this study, therefore, that if joint audit requirements have significantly reduced information risk and improve audit quality, insofar as improving perceptions of the impairment of auditor independence, then our measures of cost of equity capital would be negatively related to joint audit. On the other hand, if capital providers do not subscribe to the view that joint audit has strengthened auditor independence; they may not view single audit regulations as a threat to auditor independence. These views suggest either negative association or no association between the cost of equity capital measures and the joint audit regulations.

RESEARCH DESIGN AND SAMPLE

Empirical Model

We employ two multivariate regression models to empirically examine whether investors price the joint audit services. The two models employed, which investigate how investors' perception of joint audit services is reflected in the cost of equity capital, are specified as follows:

$$r_e = \beta_0 + \beta_1 JA + \beta_2 \, ln(Size) + \beta_3 \, Irisk + \beta_4 \, Loss + \beta_5 \, B/P + \beta_6 \, Lev + \beta_7 \, ln(LTG) + \varepsilon$$

Model (1)

$$r_e = \beta_0 + \beta_1 JA + \beta_2 \ln(Size) + \beta_3 Irisk + \beta_4 Beta + \beta_5 Loss + \beta_6 B/P + \beta_7 Lev + \beta_8 lndCOC + \beta_9 \ln(LTG) + \varepsilon \quad \text{Model (2)}$$

We define the dependent variable (r_e) as the expected cost of equity measure in Model (1), and the implied cost of equity measure in Model (2). The definition of r_e measures, the test variable (*JA*), and control variables is reported in Table 2.

Dependent Variable

To estimate the cost of equity capital (r_e), we employ the expected cost of equity capital (r_{CAPM}) and the implied cost of equity capital (r_{AVG}) as follows:

Expected Cost of Equity Capital

The firm's annualized expected cost of equity obtained, following Dong et al. (2006), by estimating a firm-specific rate using the capital assets pricing model (CAPM) as follows:

$$E(r) = r_f + \hat{\beta} [E(r_m) - r_f],$$

where r_f is the risk free rate, estimated as the U.S treasury annual long term rate,[2] $\hat{\beta}$ is the systematic risk, obtained as the coefficient estimate of R_m from a market model regression ($R_i = \alpha + b_1 R_m + \varepsilon$), where R_i is the firm's monthly returns, and R_m is the market monthly returns, $\hat{\beta}$ is estimated requiring a maximum of 60 monthly returns and a minimum of 24 months.[3] $[E(r_m) - r_f]$ is the risk premium rate estimated by applying the historical premium approach using the last 5 years prior to the inception date (Damodaran 2008).

Implied Cost of Equity Capital

To estimate the implied cost of equity capital, we employ methods adopted in the extant literature that ex ante infer an estimate of the implied cost of equity using the residual

[2] The treasury annual long term rate is obtained from the Federal Reserve website (www.federalreserve.gov/releases/h15/data.htm).
[3] Following Ashbaugh-Skaife et al. (2009), the standard market model is estimated using monthly returns requiring a minimum of 24 and maximum of 60 observations.

income and growth valuation models developed by Ohlson (1995), Feltham and Ohlson (1995), and Ohlson and Juettner-Nauroth (2005). More specifically, we deduce estimates of the implied cost of equity using the estimation methods of Gebhardt et al. (2001), Claus and Thomas (2001), Gode and Mohanram (2003), Easton (2004), and Ohlson and Juettner-Nauroth (2007). We refer to these estimates as r_{GEB}, r_{CT}, r_{GM}, r_{EST}, and r_{MOJ}, respectively. Because each of the five models is unique in its assumptions and definitions to estimate the implied cost of equity, considerable variation is expected in the magnitude of the associations between the various implied cost of equity estimates and risk proxies. To mitigate the effect that particular assumptions of each model might have on our results, we follow an approach similar to that adopted by Dhaliwal, Heitzman, and Li (2006) and Hail and Leuz (2008), by employing the average of the five implied cost of equity measures (r_{AVE}) as the dependent variable in the regression models. We separately report the results of additional tests using the five individual cost of equity measures later in the paper. The five implied cost of equity models and the input variables are described in Appendix 1.

Test and Control Variables

Our test variable in Model (1) and Model (2) is the Joint Audits variable (*JA*) and it is a dichotomous variable coded 1 for joint audits firms, and 0 for single audits firms.

We employ eight (six) variables derived from prior studies in Model 2 (Model 1) to control for the effect of other factors on cost of equity capital. All variables are defined in Table 1.

To begin, The natural logarithm of total assets (*Size*) represents a firm's size and is included under the assumption that differences in information environment can lead to lower risk for large firms than for small firms (Gebhardt, Lee, and Swaminathan 2001; Gode and Mohanram 2001; Ali, Hwang, and Trombley 2003). We then control for the variables of *Beta* and *Irisk* to capture the systematic and non-systematic(idiosyncratic) risk components of stock price variability which are included under the assumption that market prices the systematic and idiosyncratic risk (Merton 1987; Ali, Hwang, and Trombley 2003).[4] Given that profits are more informative than losses about the firms' future prospects, we added *Loss* to the model under the assumption that investors may assign a lower cost of equity for unprofitable firms.[5] Gebhardt et al. (2001) argue that undervalued stocks (high book value-to-price ratio) should earn an abnormally high implied risk premium until the mispricing is corrected. Therefore, *B/P* is added to the model under the assumption that they proxy for omitted risk factors (Ali, Hwang, and Trombley 2003; Fama and French 1992). The variable *Lev*, following Ashbaugh-Skaife et al. (2009), represents debt to total assets ratio, and is included under the assumption that a higher level of debt increases the risk of a firm's bankruptcy and gives rise to agency problems, and increases the level of asymmetric information that require additional costly monitoring (Jensen and Meckling 1976).[6] Finally, we control for the industry cost of equity capital (*IndCOC*) which captures the variability of the information environment between industries, and *ln(LTG)* which captures the long term growth rate as one of the properties of analyst forecasts (Gebhardt, Lee, and Swaminathan 2001; Dhaliwal et al. 2005; Dhaliwal, Krull, and Zhen Li 2007; Gode and Mohanram 2003).[7]

Note that in the implied cost of equity,we have not control for the *IndCOC* and *Beta* variables.

Definitions of test variables are discussed in Table 1.

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[4] Prior studies suggest the use of the Fama and French (1996) three risk factors (*βMKT*, *βSMB*, and *βHML*) to control for risk. However, where data availability is a problematic, we were only able to estimate *Beta* and *Irisk* as proxies for the risk factors.

[5] In recent years, most of the Insurance companies in the Saudi market are making losses.

[6] The cost of equity is an increasing function of the amount of its debt (Modigliani and Miller 1958). Fama and French (1992) find a positive relation between market leverage and ex post mean stock returns. Gode and Mohanram (2003) also find positive association between implied cost of equity and leverage. These studies suggest the effect of greater leverage on firm risk, and thus firm value.

[7] Prior studies also suggest the use the number of analysts following and the dispersion of analysts' earnings forecasts to control for the quality of information publicly available, however, we were unable to add it to the model due to lack of data.

<<< INSERT TABLE 1 ABOUT HERE >>>

The Sample

Our test indicator variable of JA is hand-collected data and constructed using audit report of all firms listed in Tadawul All Share Index (TASI) during the period 2007 through 2010. Our dependent and control variables sample is based on all data available in Gulf Base database and the Saudi Stock Exchange database (Tadawul) for all firms listed in TASI. Panel A of Table 1 outlines the sample selection procedure and show that the initial sample obtained for the test variable of JA is 507 firm-year observations (single audit observations=399, and joint audit observations=108). The final sample obtained for r_{CAPM} (the expected cost of equity model) after matching with the test control variables is 256 firm-year observations, and for r_{AVG} (the implied cost of equity model), after refining 42 firm-year observations, is 187 firm-year observations. Panel B and Panel C of Table 1 report the year and industry membership of our final sample. The industry membership information shows that the insurance sector has zero observations when r_{AVG} is used as a measure of cost of equity.

<<< INSERT TABLE 2 ABOUT HERE >>>

RESULTS

Descriptive Statistics and Univariate Analyses

Panel A of Table 3 reports descriptive statistics for the expected cost of equity model across our full sample, joint audits sample (JA sample), and single audits sample (SA sample). The summary statistics for r_{CAPM} indicates that the mean (median) risk premium required by investors is 9.0 (8.8) percent for the full sample. The mean (median) of the JA sample and the SA sample are 8.2 (8.9) percent and 9.4 (10.8) percent, respectively. These data suggest that investors require significantly less (t-statistic = 5.08, and Wilcoxon Z =

5.38) rate of return for firm with two auditors compared to firms with a single auditor. The summary statistics of *ln(Size)*, *B/P* ratio, and *Lev* suggest that JA sample is significantly larger in size, less overpriced, and highly leveraged compared to SA sample.

<<< INSERT TABLE 2 ABOUT HERE >>>

The main summary statistics for the implied cost of equity model, reported in Panel B of Table 3, indicate that the mean (median) of r_{AVG} , which is constructed as the average of the five implied cost of equity estimates, is 9.2 (9.0) percent.[8] In contrast to r_{CAPM}, the mean r_{AVG} of the JA sample (9.1 percent) is not significantly different from that for the SA sample (9.2 percent). Other statistics in this model also suggest that JA sample is significantly larger in size, less exposed to the idiosyncratic (*Irisk*) and systematic risk (*Beta*), more profitable (*Loss*), highly leveraged, and has strong growth prospects evident by *ln(LTG)*.

Panel C of Table 3 reports descriptive statistics for four joint audits samples structured based on (1) audit quality, and the voluntary versus the mandatory settings. That is joint audits by two big firms (JA_{BB} sample), joint audits by one big and one small firms (JA_{BS} sample), voluntary joint audits ($JA_{Voluntary}$ sample), and mandatory joint audits ($JA_{Mandatory}$ sample). The summary statistics indicates that r_{CAPM} of the JA_{BB} sample (7.9 percent) is significantly (at the 1 percent level) lower than r_{CAPM} of the JA_{BS} sample (9 percent) (t-statistic = 2.77, and Wilcoxon Z = 2.35), suggesting, at least at the univariate analyses, that firms that are audited by two big accounting firms are highly priced by market participants compared to firms that are audited by one small and one big firms. The mean of the implied cost of equity measure (r_{AVG}) for the JA_{BB} sample (8.8 percent) is lower than that of the JA_{BS} sample (11 percent), however, the two samples are not significantly different from each other.

[8] Consistent with prior research (e.g., Guay, Kothari, and Shu 2005; Ogneva, Subramanyam, and Raghunandan 2007; Dhaliwal, Heitzman, and Zhen Li 2006), statistics for the five individual implied cost of equity measures (untabulated) indicate that the Easton (2004) [r_{EST}], Ohlson and Juettner-Nauroth (2007) [r_{MOJ}] and Gode and Mohanram (2003) [r_{GM}] models produce larger implied cost of equity estimates, in comparison to the estimates obtained from the Claus and Thomas (2001)[r_{CT}] and Gebhardt et al. (2001) [r_{GEB}] models.

The results also indicates that the $JA_{Voluntary}$ sample has significantly lower r_{CAPM} and r_{AVG} (8.1 and 8.3 percent, respectively) as opposed to the $JA_{Mandatory}$ sample (9 and 11.5 percent, respectively), which suggests, at the univariate analyses, that the practices of voluntarily appointing two auditors is preferable.

Multivariate Analyses

Table 4 reports Pearson and Spearman correlation matrices for the expected cost of equity model (Panel A), and for the implied cost of equity model (Panel B). While there are a number of significant correlations, they are not sufficiently large to pose multicolinearity threats. The highest variance inflation factor is 3.84 in Panel B which is well below the threshold of 10 beyond which multicolinearity may be a problem (Kennedy 2008).

<<< INSERT TABLE 4 ABOUT HERE >>>

Table 5 reports the results for our baseline multivariate regression model (Model 1), which regresses the expected cost of equity capital (r_{CAPM}) on the test variable of joint audits (*JA*) and six control variables. Note that in this model, the two variables of *Beta* and *IndCOC* are excluded from the model.[9]

<<< INSERT TABLE 5 ABOUT HERE >>>

The results, reported in the third column of Table 5, indicate a negative and significant association between r_{CAPM} and *JA* (p-value < 0.0001), suggesting that investors perceive *JA* positively. In line with regulators' expectations, it appears that investors consider JA as mean of enhancing auditor independence, and thus the credibility of the financial information., The results for the control variables indicate that *Irisk* and *Loss* are positively associated with r_{CAPM} (p-value < 0.0001), which is consistent with the predicted sign. Further

[9] Given that r_e in Model (1) is estimated using CAPM, and the systematic risk components of stock price variability (*Beta*) is used in the estimation of r_e, the inclusion of *Beta* poses minor multicollinearity threats with a variance inflation factor larger than 5. Prior studies suggest the inclusion of *IndCOC* only in the implied cost of equity literature. However, it should be noted that the results of all test variables in all models do not change even with the inclusion of *Beta* and *IndCOC*.

tests (untabulated) is executed after clustering the standard errors by firm and the coefficient estimate of *JA* remains negative and highly significant at the 1 percent level (-0.014, t-statistic = -4.14). We also include industry dummies in another version of the model (Model 1) and the results (untabulated) show that *JA* coefficient estimate remains negative (-0.008) and highly significant at the 1 percent level (t-statistic = -2.63).

Table 6 reports the results from the regression of r_{AVG} on *JA* and control variables (Model 2). The Model is executed in two versions reported in the third and fourth columns, where in the third column (Model 2.1), the variable *ln(LTG)* is excluded, and in the fourth column (Model 2.2), test and control variables are included in their entirety. Note that in Model (2), the two variables of *Beta* and *IndCOC* are included, and insurance firms are not covered by this sample.

<<< INSERT TABLE 6 ABOUT HERE >>>

The results, reported in Model (2.1) and Model (2.2), indicate that the coefficient estimates of r_{AVG} (-0.025 and -0.020, respectively) are negative and significant at the 1 percent level for Model (2.1) and the 5 percent level for Model (2.2). The results are consistent with the results of Model (1) suggesting that investors price *JA* positively.

Furthermore, we find that r_{AVG} is positively (negatively) and significantly associated with *IndCOC*, and *ln(LTG)* (*Loss* and *B/P*). The test and control variables in Model (2.2) collectively explain 50.2 percent of the variations in the average implied cost of equity.

ADDITIONAL ANALYSES

Individual Implied Cost of Equity Measures

As discussed earlier, the implied cost of equity measure used for the analyses in Table 6 is based on the average of the five implied cost of equity measures (r_{GEB}, r_{CT}, r_{GM}, r_{EST}, and r_{MOJ}). A limitation of employing an average-based cost of equity measure is that some of the individual cost of equity measures may be more highly correlated with certain risk proxies than others (e.g., Botosan and Plumlee 2005; Dhaliwal, Heitzman, and Zhen Li 2006; Guay, Kothari, and Shu 2005). To evaluate how the effect of the *JA* varies across the five individual implied cost of equity measures, we replicate our analysis in Table 7 separately for each measure.

<<< INSERT TABLE 7 ABOUT HERE >>>

The results of Model (2.1) from these analyses indicate that the variable of *JA* is negatively and significantly associated with all five individual cost of equity measures. The association is significant at the 1 percent level for r_{GM}, the 5 percent level for r_{GEB} and r_{CT}, and at the 10 percent level for r_{EST} and r_{MOJ}. On the other hand, in Model (2.2) we find that only three measures (r_{GM}, r_{GEB}, and r_{CT}) to be negatively and significantly (p-value < 0.05) associated with *JA*. Overall, these findings are consistent with our main results and indicate that our findings are not spuriously driven by a single cost of equity measure. The lowest adjusted R^2 is 30 percent (r_{EST}) and the highest is 73.4 percent (r_{GEB}).

Audit Quality and Voluntary vs Mandatory Analyses

Next, because it is possible that investor reaction to joint audit may be stronger if both auditors are big 4 accounting firms, we undertake an analysis after splitting the joint audit sample into clients of two big auditors (JA_{BB} sample), and clients of one big and one small auditors (JA_{BS} sample). We regress r_{CAPM} to JA_{BB} (JA_{BS}), where JA_{BB} (JA_{BS}) is a dummy variable coded 1 for firms with two big (one big and one small) auditors, and 0 for firms with a single auditor. Note that, in this analyses, we apply r_{CAPM} as our dependent variable as it generates more observations that covered both, the banking and insurance industries. The results from these analyses are presented in Model (1) and (2) of Table 8.

<<< INSERT TABLE 8 ABOUT HERE >>>

In model (1), we replicate our analyses of Table 5 after replacing the test variable of *JA* by the variable of JA_{BB} and the results show the coefficient estimate of the JA_{BB} variable to be negative and highly significant at the 1 percent level ($\beta 1$ = -0.022, and t-statistic = -6.01). In model (2), we include JA_{BS} as our test variable and the coefficient estimate of JA_{BS} remains negative but significant at the 10 percent level ($\beta 1$ = -0.007, and t-statistic = -1.72). Collectively, these results suggest that investors' positive perception surrounding joint audits (e.g., the results obtained in Table 5) is slightly driven by the sample of firms with two big 4 auditors.

In the previous tests (Model 1 of Table 5, and Models 1 and 2 of Table 8), we compared the JA sample and the audit quality of JA sample against SA sample (single audit) without considering audit quality of the SA sample. Hence, we expand our sensitivity analyses by employing two more variable to examine whether the results obtained in the previous tests are mainly driven by the low audit quality of the SA sample. The first variable created is coded 1 for firms with two joint auditors, and 0 for firms with a big 4 single auditor (*JAvB4S*), and the second variable is coded 1 for firms with two big 4 auditors, and 0 for firms with a big 4 single auditor (*JAB4vB4S*). The results (untabulated) show that the coefficient estimate of *JAvB4S* to be negative and significant at the 1 percent level ($\beta 1$ = -0.015, and t-statistic = -5.47), and *JAB4vB4S* is negatively and significantly (at the 10 percent level) associated with r_{CAPM} ($\beta 1$ = -0.013, and t-statistic = -1.9). These results are still consistent with our previous results and predictions, and suggest that appointing two auditors is preferable by outside investors despite the quality of a single auditor.

Finally, to further assess the evolving perception of investors for the voluntary versus the mandatory requirements of joint audit, we undertake a final analysis by splitting our joint audit sample into voluntary joint audits sample ($JA_{Voluntary}$ sample), and mandatory joint audits ($JA_{Mandatory}$ sample). We regress r_{CAPM} to $JA_{Voluntary}$ ($JA_{Mandatory}$), where $JA_{Voluntary}$

($JA_{Mandatory}$) is a dummy variable coded 1 for firms that voluntarily (mandatorily) appointed two joint auditors, and 0 for firms with a single auditor. The results tabulated in Model (3) and Model (4) of Table 8 shows that only $JA_{Mandatory}$ coefficient estimate to be negative and highly significant (p-value < 0.001). Hence, it appears that our result for *JA* in Model (1) of Table 5 is systematically driven by investors' positive perception of the mandatory settings. A possible explanation for the insignificant coefficient on $JA_{Voluntary}$ could be that investors are not yet aware that few firms in other industries, other than the regulated banking and insurance, are appointing two auditors. In other words, the market is just pricing the regulated industries.

SUMMARY AND CONCLUSIONS

This study examines Saudi investors' perception of the usefulness of the regulatory joint audit requirements, aimed at enhancing the level of auditor independence . Specifically, we investigate the relationship between cost of equity capital and the indicator variable of the joint audit, and document a significant negative association. The findings suggest that the regulatory joint audit requirements are perceived by investors as a mean of decreasing information risk that leads to the economic effect of investors requiring lower rate of return. Our findings remain robust for the two measures of the cost of equity capital, the five individual implied cost of equity measures, and after controlling for industries and clustering for the standard errors by firm.

When we replicate the tests to analyze the effect of mandatory vs. voluntary joint audit regulations, we find that our main findings are driven primarily by the sample of firms that are subject to mandatory regulations. Additionally, we find that investors' perception of joint audit regulation is positive and even stronger if two Big 4 auditors conducting the joint audit suggesting that audit quality is a crucial when appointing the two independent auditors.

Our study contributes to the scant literature of joint audit and to the regulatory debate of the usefulness of the joint audit regulations. Our results can have policy implications for the Saudi Capital Market Authority (CMA) and SOCPA by showing that the mandated joint audit regulations appears to have done little to the issue of auditor independence.

APPENDIX 1

The Implied Cost of Equity Models

Similar to prior studies in this research stream, to construct the implied cost of equity measures, we require each firm to have available (a) stock price at the end of each firm's fiscal year; (b) book value of equity per share, dividends per share, and actual earnings per share data at the beginning of each firm's fiscal year, and (c) the one-, two- and three-year ahead analysts' forecasted earnings per share [*FEPS1*, *FEPS2* and *FEPS3*][10] and the mean of analysts' estimate of long term growth rate[11].Then to estimate the implied cost of equity, we use the models developed by Gebhardt et al. (2001), Claus and Thomas (2001), Gode and Mohanram (2003), Easton (2004), and Ogneva et al. (2007) as follows:

Gebhardt et al. (2001),

The Gebhardt et al. (2001) model is derived from the residual income valuation model (Ohlson, 1995), and uses analyst forecasts for the first three years. Beyond that, *EPS* is assumed to revert to the industry median return of equity (*TROE*). The model is defined as:

$$P_t = B_t + \frac{\left[f^{ROE_{t+1}} - r_{GLS}\right] B_t}{[1+r_{GLS}]} + \frac{\left[f^{ROE_{t+2}} - r_{GLS}\right] B_{t+1}}{[1+r_{GLS}]^2} + \frac{\left[f^{ROE_{t+3}} - r_{GLS}\right] B_{t+2}}{[1+r_{GLS}]^2 \ r_{GLS}} + TV$$

Where:

$$TV = \sum_{i=4}^{T-1} \frac{\left[f^{ROE_{t+i}} - r_e\right] B_{t+i-1}}{[1+r_e]^i} + \frac{\left[f^{ROE_{t+T}} - r_e\right] B_{t+T-1}}{[1+r_e]^{T-1} \ r_e}$$

P_t	=	share price at the end of fiscal year *t*;
B_t	=	actual book value of equity at the beginning of fiscal year *t* divided by the number of shares outstanding at the end of fiscal year *t*;
$f^{ROE_{t+1}}$	=	the forecasted return on equity for the *t*+1 period equals to $f^{EPS_{t+1}} / B_t$, where $f^{EPS_{t+1}}$ is analysts' forecasted earnings per share - one year ahead;
$f^{ROE_{t+2}}$	=	the forecasted return on equity for the *t*+2 period equals to $f^{EPS_{t+2}} / BV_{t+1}$, where $f^{EPS_{t+2}}$ is analysts' forecasted earnings per share - two year ahead;
$f^{ROE_{t+3}}$	=	the forecasted return on equity for the *t*+3 period equals to $f^{EPS_{t+2}} * (1 + Ltg)$, divided by B_{t+2}, where *Ltg* is analysts' long-term growth rate estimated following Dhaliwal et al. (2007) as $([f^{EPS_{t+2}} / f^{EPS_{t+1}}] - 1)$ for firms with positive values of $f^{EPS_{t+1}}$ and $f^{EPS_{t+2}}$;
TV	=	terminal value with $T = 12$. Forecasts of $f^{EPS_{t+4}}$ to $f^{EPS_{t+T}}$ are estimated by median

[10] In Saudi, a database that provides analysts' earnings forecasts is not available, therefore, *FEPS1* and *FEPS2*, and *FEPS3* are estimated following the procedure that Dhaliwal et al. (2007) used to estimate *FEPS3*, *FEPS4*, and *FEPS5* if one of them is not available . More specifically, we built the estimation of *FEPS1* and *FEPS2* based on the lagged two years of the actual earnings per share. We also include forecasted earnings per share for four and five years ahead (*FEPS4* and *FEPS5*).

[11] We also estimate the long term growth rate forecast by following follow Dhaliwal et al (2007) and estimate long term growth rate as (*FEPS2 – FEPS1/FEPS2*) for firms with positive values of *FEPS1* and *FEPS2*.

interpolation to the industry target return on equity (*TROE*). Where, *TROE* is calculated at the end of each firm's fiscal year, and forecasted as the moving median of the past five years of return on equity (*ROE*) for all firms within the same industry, where *ROE* equals income before extraordinary items (*IB*) scaled by total common equity (*CEQ*. Firms are then classified based on industry. Observations in which *IB* or *CEQ* are negative were excluded from the calculation because these observations do not represent long term industry equilibrium rates of return. The medians are then averaged for all firms in the same industry to have a representative yearly *TROE* for each industry;

$\sum_{i>1} B_{t+i}$ = future book value of equity estimated using clean surplus accounting, and equals to $B_{t+i-1} + f^{EPS_{t+i}} - k \,.\, f^{EPS_{t+i}}$, where $k \,.\, f^{EPS_{t+i}}$, is forecasted dividends per share, and k is the dividend payout ratio, calculated as the actual dividends per share at the beginning of year t (DPS_{t-1}) divided by the actual earnings per share at the beginning of fiscal year t (EPS_{t-1}). When $EPS_{t-1} \leq 0$, then DPS_{t-1} is estimated as 6% of total assets per share at the beginning of year t;

r_{GLS} = The estimated implied cost of equity obtained following the assumptions of Gebhardt et al. (2001).

Claus and Thomas (2001),

Claus and Thomas (2001) model is also based on the residual income model to estimate the cost of equity capital, but propose different perpetual growth assumption in estimating terminal value. The model uses actual book values per share and forecasted earnings per share up to five years ahead to derive the expected future residual income series. The model implies that the value of a firm can be expressed as:

$$P_t = B_t + \sum_{i=1}^{T=5} \frac{f^{EPS_{t+i}} - r_{CT} B_{t+i-1}}{[1+r_{CT}]^i} + \frac{[f^{EPS_{t+T}} - r_{CT} B_{t+T-1}][1+g]}{[r_{CT} - g][1+r_{CT}]^T}$$

Where:

P_t = share price at the end of fiscal year t ;

$f^{EPS_{t+i}}$ = analysts' forecasted earnings per share in time $t+i$. Where analysts' forecasted earnings per share for three, four and five year-ahead are estimated as $f^{EPS_{t+i-1}} * (1 + Ltg)$;

B_t = book value of equity at the beginning of fiscal year t divided by the number of shares outstanding at the end of fiscal year t (Compustat data item 60 / Compustat data item 25);

$\sum_{i>1} B_{t+i}$ = future book value of equity estimated using clean surplus accounting, and equals to $B_{t+i-1} + f^{EPS_{t+i}} - k \,.\, f^{EPS_{t+i}}$, where $k \,.\, f^{EPS_{t+i}}$, is forecasted dividends per share, and k is the dividend payout ratio calculated as the actual dividends per share at the beginning of year t (DPS_{t-1}) divided by the actual earnings per share at the beginning of fiscal year t (EPS_{t-1}). When $EPS_{t-1} \leq 0$, then DPS_{t-1} is estimated as 6% of total assets per share at the beginning of year t;

g = the growth rate of residual earnings in perpetuity equal to the expected inflation rate (r_{rf} - 0.03), where r_{rf} is the risk free rate;

r_{CT} = The estimated implied cost of equity obtained following the assumptions of Claus and Thomas (2001).

Gode and Mohanram (2003),

The Gode and Mohanram (2003) model is based on the Ohlson and Juettner-Nauroth (2005) abnormal earnings growth valuation model. It uses one-year ahead and two-year ahead earnings per share forecasts, as well as expected dividends per share, in period t+1 to derive a measure of abnormal earnings growth. The model implies that the value of a firm can be inferred as follows:

$$r_{GM} = A + \sqrt{A^2 + \left(\frac{f^{EPS_{t+1}}}{P_t}\right)(g_2 - g)}$$

Where:

$$A = \frac{1}{2}\left[g + \frac{k \,.\, f^{EPS_{t+1}}}{P_t}\right]$$

$$g_2 = \frac{\left[f^{EPS_{t+2}} - f^{EPS_{t+1}}\right]}{f^{EPS_{t+1}}}$$

r_{GM}	=	the estimated implied cost of equity obtained following the assumptions of Gode and Mohanram (2003);
P_t	=	share price at the end of fiscal year t ;
$f^{EPS_{t+1}}$	=	analysts forecasted earnings per share one year-ahead;
$f^{EPS_{t+2}}$	=	analysts forecasted earnings per share two year-ahead;
$k \,.\, f^{EPS_{t+1}}$	=	forecasted dividends per share in time $t+i$, where k is the dividend payout ratio calculated as the actual dividends per share at the beginning of year t (DPS_{t-1}) divided by the actual earnings per share at the beginning of fiscal year t (EPS_{t-1});
g	=	the growth rate of residual earnings in perpetuity equal to the expected inflation rate (r_{rf} - 0.03), where r_{rf} is the risk free rate.

The Price-Earnings Growth (PEG) Ratio Modified by Easton (2004),

Easton (2004) also implements the abnormal earnings growth valuation model developed by Ohlson and Juettner-Nauroth (2005) and modifies the price-earnings growth ratio by using the one-year ahead and two year ahead earnings per share and dividends per share in period t+1 to derive the measure of abnormal earnings growth, and assumes that the growth in abnormal earnings to persist in perpetuity after the initial period.

$$P_t = \left[\frac{f^{EPS_{t+1}} + r_{EST}\left[k \,.\, f^{EPS_{t+1}}\right] - f^{EPS_{t+2}}}{\left[r_{EST}\right]^2}\right]$$

Where:

P_t	=	share price at the end of fiscal year t ;
$f^{EPS_{t+1}}$	=	analysts forecasted earnings per share one year-ahead;
$f^{EPS_{t+2}}$	=	analysts forecasted earnings per share two year-ahead;
$k \,.\, f^{EPS_{t+1}}$	=	forecasted dividends per share in time $t+i$, where k is the dividend payout ratio calculated as the actual dividends per share at the beginning of year t (DPS_{t-1}) divided by the actual earnings per share at the beginning of fiscal year t (EPS_{t-1});
r_{EST}	=	the estimated implied cost of equity obtained following the assumptions of Easton (2004).

The Modified Ohlson and Juettner-Nauroth (2005), Used in Ogneva et al. (2007),

This model is derived from the Ohlson and Juettner-Nauroth (2005) method using all the information, including the long-term growth rate, contained in the analysts' earnings forecast. It has no explicit assumption about terminal value and assumes constant growth rate. The model is defined as:

$$P_t = \frac{f^{EPS_{t+1}}}{r_{OSR}} + \frac{z_{t+1}}{1+r_{OSR}} + \frac{z_{t+2}}{[1+r_{OSR}]^2} + \frac{z_{t+3}}{[1+r_{OSR}]^3} + \frac{z_{t+4}}{[r_{OSR}-g][1+r_{OSR}]^3}$$

$$z_{t+i} = 1/r_{OSR}[\left(f^{EPS_{t+i+1}} + r_e * k \,.\, f^{EPS_{t+i}}\right) - \left((1+r_{OSR})\, FEPS_{t+i}\right)]$$

Where:

P_t	=	share price at the end of fiscal year t;
$f^{EPS_{t+1}}$	=	analysts forecasted earnings per share one year-ahead;
$f^{EPS_{t+i}}$	=	analysts' forecasted earnings per share in time $t+i$. Where analysts' forecasted earnings per share for three, four, five and six year-ahead are estimated as $f^{EPS_{t+i-1}} * (1+Ltg)$;
$k \,.\, f^{EPS_{t+i}}$	=	forecasted dividends per share in time $t+i$, where k is the dividend payout ratio calculated as the actual dividends per share at the beginning of year t (DPS_{t-1}) divided by the actual earnings per share at the beginning of fiscal year t (EPS_{t-1});
g	=	the growth rate of residual earnings in perpetuity equal to the expected inflation rate (r_{rf} - 0.03), where r_{rf} is the risk free rate;
r_{OSR}	=	the estimated implied cost of equity obtained following the assumptions of Ogneva et al. (2007).

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TABLE 1
Variable Definitions

Variables	Definition
r_{CAPM}	the expected cost of equity estimated using CAPM model
r_{GM}	the implied cost of equity capital estimated following Gode and Mohanram (2003)
r_{GEB}	the implied cost of equity capital estimated following Gebhardt et al. (2001)
r_{EST}	the implied cost of equity capital estimated following Easton (2004)
r_{CT}	the implied cost of equity capital estimated following Claus and Thomas (2001)
r_{MOJ}	the implied cost of equity capital estimated using the modified Ohlson and Juettner-Nauroth (2005) and adapted by Ogneva et al. (2007)
r_{AVG}	the average of the above five individual measures of the implied cost of equity capital
JA	an indicator variable coded 1 for firms with two joint auditors, and 0 for firms with a single auditor
JA_{BB}	an indicator variable coded 1 for firms with two big auditors, and 0 for firms with a single auditor
JA_{BS}	an indicator variable coded 1 for firms with one big auditor paired with a non-big auditor, and 0 for firms with a single auditor
$JA_{Voluntary}$	an indicator variable coded 1 for firms that voluntarily appointed two joint auditors, and 0 for firms with a single auditor
$JA_{Mandatory}$	an indicator variable coded 1 for firms that mandatorily appointed two joint auditors, and 0 for firms with a single auditor
ln(Size)	the natural logarithm of total assets
Beta	systematic risk, obtained as the coefficient estimate of R_m from firm-specific standard market model regression ($R_i=\alpha+b_1R_m+\varepsilon$) requiring a maximum of 60 monthly returns prior to the firm's fiscal year-end, and a minimum of 55 months, where R_i= the firm's monthly returns, R_m = the market monthly returns
Irisk	idiosyncratic risk or return variability at the end of year *t*, calculated as the standard deviation of residuals from firm-specific standard market model regression, estimated requiring a maximum of 60 monthly returns prior to the firm's fiscal year-end, and a minimum of 55 months
Loss	an indicator variable coded 1 if the firm's income before extraordinary items is less than 1 in the prior year, and 0 otherwise
B/P	book value of equity divided by market value of equity
Lev	leverage ratio estimated as total debt divided by total assets
IndCOC	the mean cost of equity for the firm's industry
ln(*Ltg*)	the natural logarithm of long-term growth in earnings forecasts estimated following Dhaliwal et al. (2007) as ($[f^{EPS_{t+2}}/f^{EPS_{t+1}}]$ - 1) for firms with positive values of $f^{EPS_{t+1}}$ and $f^{EPS_{t+2}}$

TABLE 2

Sample Selection, Year and Industry Membership

Panel A: Sample Selection	**Observations**
The initial sample obtained for the joint audit and single audit sample	507
▪ Single audit sample	399
▪ Joint audit sample	108
Final sample obtained for the expected cost of equity model after matching r_{CAPM} with test and control variables	256
The initial sample obtained after matching r_{AVG} with test and control variables	221
The sample is then refined following prior studies (Dong et al. 2006) by excluding:	
▪ observations in which dividends payout ratio (k) exceeds 1	(19)
▪ observations in which actual book value per share B_t is negative	(23)
Final sample obtained for the implied cost of equity model	179

Panel B: Year Membership of Sample Firms

Year	Number of Firms	% of Sample	SA Sample	JA Sample
The Expected Cost of Equity Model:				
2007	53	20.70	36	17
2008	61	23.83	46	15
2009	67	26.17	43	24
2010	75	29.30	50	25
Total Sample	256	100.00	175	81
The Implied Cost of Equity Model:				
2007	39	21.79	23	16
2008	45	25.14	34	11
2009	45	25.14	34	11
2010	50	27.93	39	11
Total Sample	179	100.00	130	49

Panel C: Industry Membership of Sample Firms

Industry Code	Industry Name	Number of Firms	% of Sample	SA Sample	JA Sample
The Expected Cost of Equity Model:					
1	Banking	39	15.23	0	39
2	Petrochemical Industries	40	15.63	39	1
3	Cement	32	12.50	28	4
4	Retail	28	10.94	27	1
5	Energy and Utilities	8	3.13	8	0
6	Agriculture and Food	47	18.36	44	3
7	Telecom and IT	8	3.13	4	4
8	Insurance	28	10.94	0	28
9	Multi-Investment	26	10.16	25	1
Total Sample		256	100.00	175	81
The Implied Cost of Equity Model:					
1	Banking	37	20.67	0	37
2	Petrochemical Industries	27	15.08	27	0
3	Cement	31	17.32	27	4
4	Retail	24	13.41	23	1
5	Energy and Utilities	5	2.79	5	0
6	Agriculture and Food	35	19.55	32	3
7	Telecom and IT	8	4.47	4	4
8	Insurance	0	0.00	0	0
9	Multi-Investment	12	6.70	12	0
Total Sample		179	100.00	130	49

TABLE 3
Descriptive Statistics and Test of Differences

Panel A: Descriptive Statistics for the Full Sample, JA Sample, and SA Sample-The Expected Cost of Equity Model

	Full Sample (n = 256)		**JA Sample (n = 81)**		**SA Sample (n = 175)**		**Test of Differences**	
Variables	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**	**t-statistic**	**Wilcoxon Z**
r_{CAPM}	0.090	0.088	0.082	0.089	0.094	0.108	5.08***	5.38***
JA	0.316	0	1	1	0	0	-	-
ln(Size)	15.102	14.764	16.118	18.523	14.631	15.662	-5.36***	-4.32***
Irisk	0.037	0.037	0.038	0.042	0.037	0.045	-0.75	-1.37
Loss	0.199	0.000	0.222	0	0.189	0	-0.62	-0.62
B/P	0.455	0.414	0.379	0.480	0.491	0.634	3.39***	2.90***
Lev	0.482	0.445	0.789	0.869	0.340	0.500	-7.53***	-10.01***
ln(*LTG*)	0.485	0.614	1.521	2.747	1.522	2.684	0.01	0.14
Panel B: Descriptive Statistics for the Full Sample, JA Sample, and SA Sample-The Implied Cost of Equity Model								
r_{AVG}	0.092	0.090	0.091	0.110	0.092	0.115	0.08	0.092
JA	0.274	0	1	1	0	0	-	-
ln(Size)	15.528	15.073	17.629	18.651	14.736	15.863	-9.88***	-7.44***
Irisk	0.036	0.036	0.038	0.043	0.035	0.042	-1.78*	-2.37**
Beta	1.027	1.045	0.888	1.047	1.079	1.230	5.63***	5.09***
Loss	0.089	0	0.020	0	0.115	0	2.01**	1.99**
B/P	0.471	0.439	0.432	0.521	0.486	0.622	1.45	1.24
Lev	0.443	0.425	0.733	0.884	0.334	0.498	-11.54***	-7.85***
IndCOC	0.099	0.096	0.107	0.096	0.095	0.104	-1.89*	-2.32**
ln(*LTG*)	0.694	0.908	2.516	2.905	2.049	2.987	-2.33**	-2.27**

(continued on next page)

TABLE 3 (continued)

Panel C: Descriptive Statistics for the JA_{BS} Sample, JA_{BS} Sample, $JA_{Voluntary}$ Sample, and $JA_{Mandatory}$ Sample

Variable	JA_{BB} Sample		JA_{BS} Sample		Test of Differences		$JA_{Voluntary}$ Sample		$JA_{Mandatory}$ Sample		Test of Differences	
	N	Mean	N	Mean	t-statistic	Wilcoxon Z	N	Mean	N	Mean	t-statistic	Wilcoxon Z
r_{CAPM}	55	0.079	23	0.090	2.77***	2.35***	67	0.081	14	0.090	1.93*	1.03
r_{AVG}	39	0.088	9	0.110	1.53	0.845	37	0.083	12	0.115	2.41**	1.197

See Table 1 for variable definitions.

*,**,*** denotes significance at the 0.10, 0.05, and 0.01 levels, respectively.

All Joint audit firms in the expected COE measure are from Banking sector (39: 38 BPB, and 1 BPS), Insurance sector (28: BPB 14, BPS 12, and SPS 2), Petrochemical Industries sector (1: BPS), cement sector (4: ALL BPS), retail sector (1: SPS), agriculture and food industries sector (3: All BPB), telecommunication and information technology sector (4: All BPS), and Multi-Investment sector (1: BPS).

All Joint audit firms in the implied COE measure are from Banking sector (37: 36 BPB and 1 BPS), cement sector (4: ALL BPS), retail sector (1: SPS), agriculture and food industries sector (3: All BPB), and telecommunication and information technology sector (4: All BPS).

TABLE 4

Pearson (Upper Diagonal) and Spearman (Lower Diagonal) Correlations Among Independent Variables

Panel A: The Expected Cost of Equity Model

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	VIF
(1) r_{CAPM}		**-0.304**	**-0.186**	**0.198**	**0.240**	0.050	-0.104	**-0.181**	-
(2) *JA*	**-0.337**		**0.319**	0.047	0.039	**-0.208**	**0.427**	0.001	1.413
(3) *ln(Size)*	**-0.193**	**0.271**		**-0.337**	**-0.360**	**0.134**	**0.303**	**0.390**	1.642
(4) *Irisk*	**0.164**	0.086	**-0.323**		**0.258**	**-0.282**	-0.121	**-0.195**	1.253
(5) *Loss*	**0.237**	0.039	**-0.376**	**0.242**		**-0.233**	-0.005	**-0.475**	1.466
(6) *B/P*	0.062	**-0.182**	**0.164**	**-0.289**	**-0.274**		-0.096	-0.038	1.246
(7) *Lev*	-0.158	**0.627**	**0.572**	**-0.126**	0.044	**-0.136**		0.025	1.299
(8) *ln(LTG)*	**-0.204**	0.009	**0.372**	**-0.191**	**-0.463**	-0.021	**0.151**		1.481

Panel B: The Implied Cost of Equity Model

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	VIF
(1) r_{AVG}		-0.006	**0.163**	**-0.161**	-0.106	**-0.388**	**-0.274**	0.083	**0.593**	**0.532**	-
(2) *JA*	0.007		**0.596**	0.133	**-0.390**	**-0.148**	-0.108	**0.655**	0.141	**0.172**	2.304
(3) *ln(Size)*	0.138	**0.558**		**-0.209**	**-0.301**	**-0.269**	-0.044	**0.805**	0.131	**0.303**	3.471
(4) *Irisk*	**-0.178**	**0.178**	**-0.177**		**0.310**	**0.153**	**-0.215**	-0.083	-0.109	-0.110	1.492
(5) *Beta*	**-0.174**	**-0.382**	**-0.285**	**0.315**		0.096	0.039	**-0.332**	**-0.219**	-0.099	1.461
(6) *Loss*	**-0.425**	**-0.148**	**-0.274**	0.098	0.091		-0.002	-0.111	**-0.305**	**-0.424**	1.429
(7) *B/P*	**-0.263**	-0.093	-0.062	**-0.227**	0.014	0.014		-0.055	**-0.267**	**-0.198**	1.203
(8) *Lev*	0.102	**0.589**	**0.763**	-0.064	**-0.286**	-0.103	-0.052		0.062	**0.338**	3.824
(9) *IndCOC*	**0.460**	**0.175**	0.114	-0.088	**-0.351**	**-0.375**	**-0.277**	0.032		**0.332**	1.321
(10) *ln(LTG)*	**0.553**	**0.171**	**0.242**	-0.094	-0.107	**-0.284**	**-0.237**	**0.400**	**0.210**		1.543

Bold figures represent correlations which are (two-tail) significant at the 5 percent level.
See Table 1 for variable definitions.

TABLE 5
Regression of the Expected Cost of Equity Measure (r_{CAPM}) on Joint Audit Attribute (*JA*)

Variables	Predicted Sign	Model (1)
Intercept	?	0.070*** (6.67)
JA	−	-0.014*** (-5.22)
ln(Size)	−	0.001 (0.93)
Irisk	+	0.321*** (3.11)
Loss	+	0.010*** (3.1)
B/P	+	0.006 (1.2)
Lev	+	0.002 (0.94)
ln(*LTG*)	+	-0.001 (-0.95)
N		256
Adj-R^2		0.172

The first row in each cell reports the coefficient estimate and the second row reports the *t*-statistics (in parenthesis).

***, **, * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

See Table 1 for variable definitions.

TABLE 6

Regression of the Average Implied Cost of Equity Measure (r_{AVG}) on Joint Audit Attribute (*JA*)

Variables	Predicted Sign	Model (2.1)	Model (2.2)
Intercept	?	0.029	-0.001
		(0.71)	(-0.02)
JA	–	-0.025***	-0.020**
		(-2.64)	(-2.28)
ln(Size)	–	0.001	0.002
		(0.6)	(1.09)
Irisk	+	-0.287	-0.197
		(-0.91)	(-0.67)
Beta	+	0.004	-0.001
		(0.28)	(-0.07)
Loss	+	-0.041***	-0.020*
		(-3.78)	(-1.85)
B/P	+	-0.038***	-0.027**
		(-2.85)	(-2.11)
Lev	+	0.021	-0.008
		(1.09)	(-0.44)
IndCOC	+	0.663***	0.577***
		(7.7)	(6.99)
ln(LTG)	+		0.013***
			(4.98)
N		179	179
Adj-R^2		0.433	0.502

The first row in each cell reports the coefficient estimate and the second row reports the *t*-statistics (in parenthesis).

***, **, * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

See Table 1 for variable definitions.

TABLE 7

Regression of the five Individual Implied Cost of Equity Measures on Joint Audit Attribute (*JA*)

	$r_e = r_{GM}$		$r_e = r_{GEB}$		$r_e = r_{EST}$		$r_e = r_{CT}$		$r_e = r_{MOJ}$	
Variables	**Model (2.1)**	**Model (2.2)**	**Model (2.1)**	**Model (2.2)**	**Model (2.1)**	**Model (2.2)**	**Model (2.1)**	**Model (2.2)**	**Model (2.1)**	**Model (2.2)**
Intercept	0.037	-0.004	-0.006	-0.034	0.006	0.004	0.025	0.002	0.082	0.029
	(0.91)	(-0.12)	(-0.16)	(-0.98)	(0.07)	(0.05)	(0.61)	(0.05)	(1.63)	(0.65)
JA	-0.026***	-0.019**	-0.022**	-0.017**	-0.035*	-0.035	-0.020**	-0.017**	-0.023*	-0.014
	(-2.69)	(-2.28)	(-2.49)	(-2.1)	(-1.66)	(-1.63)	(-2.15)	(-1.82)	(-1.93)	(-1.39)
ln(Size)	0.005**	0.006***	-0.004**	-0.004*	0.001	0.001	0.004*	0.005**	0.002	0.004
	(2.04)	(3.01)	(-2.04)	(-1.71)	(0.11)	(0.13)	(1.78)	(2.18)	(0.62)	(1.43)
Irisk	-0.274	-0.148	0.380	0.465*	-0.543	-0.538	-0.298	-0.229	-0.697*	-0.537
	(-0.86)	(-0.53)	(1.33)	(1.74)	(-0.77)	(-0.76)	(-0.95)	(-0.76)	(-1.78)	(-1.6)
Beta	-0.029*	-0.037***	0.001	-0.005	0.078**	0.077**	-0.015	-0.020	-0.012	-0.022
	(-1.84)	(-2.67)	(0.05)	(-0.35)	(2.25)	(2.22)	(-0.99)	(-1.31)	(-0.62)	(-1.32)
Loss	-0.048***	-0.018*	-0.030***	-0.010	-0.017	-0.016	-0.050***	-0.033***	-0.061***	-0.024*
	(-4.32)	(-1.77)	(-3.04)	(-1.04)	(-0.71)	(-0.61)	(-4.57)	(-2.96)	(-4.52)	(-1.88)
B/P	-0.060***	-0.044***	0.052***	0.062***	-0.049	-0.048	-0.052***	-0.044***	-0.083***	-0.063***
	(-4.35)	(-3.6)	(4.21)	(5.38)	(-1.63)	(-1.57)	(-3.9)	(-3.32)	(-4.95)	(-4.29)
Lev	0.002	-0.039**	0.056***	0.028	0.045	0.043	-0.013	-0.035*	0.015	-0.038*
	(0.12)	(-2.19)	(3.19)	(1.63)	(1.05)	(0.95)	(-0.66)	(-1.83)	(0.61)	(-1.78)
IndCOC	0.625***	0.504***	1.410***	1.328***	0.023	0.017	0.532***	0.466***	0.726***	0.571***
	(7.15)	(6.47)	(18.01)	(17.83)	(0.12)	(0.09)	(6.21)	(5.51)	(6.79)	(6.09)
ln(*LTG*)		0.019***		0.013***		0.001		0.010***		0.024***
		(7.43)		(5.24)		(0.13)		(3.77)		(7.89)
N	179	179	179	179	179	179	179	179	179	179
Adj-R^2	0.501	0.622	0.692	0.734	0.036	0.030	0.440	0.481	0.478	0.616

The first row in each cell reports the coefficient estimate and the second row reports the *t*-statistics (in parenthesis).

***, **, * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

See Table 1 for variable definitions.

TABLE 8

Regression of the Expected Cost of Equity Measure (r_{CAPM}) on Joint Audit Attributes Classified based on Audit Quality Analyses, and Voluntary vs. Mandatory Regulations Analyses

		Audit Quality Analyses		Voluntary vs. Mandatory Regulations Analyses	
Variables	**Predicted Sign**	**Model (1)**	**Model (2)**	**Model (3)**	**Model (4)**
Intercept	?	0.071***	0.040***	0.049***	0.068***
		(5.58)	(3.04)	(3.26)	(6.43)
JA_{BB}	?	-0.022***			
		(-6.01)			
JA_{BS}	?		-0.007*		
			(-1.72)		
$JA_{Voluntary}$	?			-0.004	
				(-0.93)	
$JA_{Mandatory}$	?				-0.017***
					(-5.79)
ln(Size)	−	0.000	0.002***	0.001	0.001
		(-0.12)	(2.62)	(0.61)	(1.17)
Irisk	+	0.380***	0.510***	0.559***	0.320***
		(3.55)	(4.29)	(4.62)	(3.09)
Loss	+	0.006*	0.010***	0.008**	0.009***
		(1.83)	(2.97)	(2.07)	(2.72)
B/P	+	0.009*	0.009*	0.013**	0.005
		(1.79)	(1.84)	(2.44)	(1.08)
Lev	+	0.019**	0.003	0.025***	0.004
		(2.37)	(1.16)	(2.9)	(1.47)
ln(LTG)	+	-0.001	0.001	0.001	-0.001
		(-0.63)	(0.02)	(0.04)	(-1.04)
N		230	198	189	242
Adj-R^2		0.202	0.134	0.171	0.182

The first row in each cell reports the coefficient estimate and the second row reports the *t*-statistics (in parenthesis).

***, **, * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

See Table 1 for variable definitions.