Impact of Excess Auditor Remuneration on the Cost of Equity Capital around the World

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This study examines the relation between excess auditor remuneration and the implied required rate of return (IRR hereafter) on equity capital in global markets. We conjecture that when auditor remuneration is excessively large, investors may perceive the auditor to be economically bonded to the client, leading to a lack of independence. This perceived lack of independence increases the information risk associated with the credibility of financial statements, thereby increasing IRR. Consistent with this notion, we find that IRR is increasing in excess auditor

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remuneration, but only in countries with stronger investor protection. Finding evidence of a relation only in stronger investor protection countries is consistent with the more prominent role of audited financial statements for investors' decisions in these countries. In settings in which investors are less likely to rely on audited financial statements and instead rely on alternative sources of information (i.e., in countries with weaker investor protection), the impact of client-auditor bonding should have less of an effect on investors' decisions.

1. Introduction

In this paper, we hypothesize that audits can affect the perceived credibility of financial statements and therefore can have an effect on firms' implied required rate of return (IRR) on equity capital. Presumably, audits lower firms' IRR by providing assurance to investors that reported amounts are reliable. However, when auditors' fees represent excess payment for services, investors may perceive that the auditor has an economic bond with the client. This bonding, whether real or just perceived, could reduce investors' beliefs that the auditor will act independently, thereby weakening the perceived credibility of financial statement information and increasing information risk. To test this idea, we examine the relation between excess auditor remuneration and IRR.

Furthermore, we expect the relation between auditor remuneration and IRR to vary across countries. Research shows that supporting country-level factors (e.g., securities regulation) play a role in firms' IRR. For example, Hail and Leuz (2006) show that firms in countries with stronger investor protection tend to have lower IRR. Their findings suggest that firm-level governance (e.g., audited financial statements) cannot fully substitute for weaknesses in country-level institutions. When country-level institutions are weaker, firm-level governance has less ability to affect investors' decisions, as it lacks credibility (Doidge, Karolyi, and Stulz [2007]). In contrast, when country-level institutions are stronger, factors that affect the perceived credibility of audited financial statements (e.g., excess auditor remuneration) will be more meaningful to investors. For this reason, we expect the positive relation between excess auditor remuneration and IRR to be more significant in countries with stronger investor protection.

We measure excess auditor remuneration as the residuals from a regression of total remuneration on an extensive number of firm- and country-level characteristics expected to influence auditor fees. Our model explains 72 percent of the variation in total auditor remuneration. Following extant research, we measure IRR as the average estimate from four ex ante cost of equity capital models. The evidence suggests that excess auditor remuneration relates positively to IRR and is consistent with our notion that the increase in IRR occurs because investors perceive excess auditor remuneration to represent economic bonding between the auditor and the client. We also find that the relation between excess auditor remuneration and IRR varies with the degree of investor protection across countries. Specifically, we find a positive relation between excess auditor remuneration and IRR in stronger investor protection countries, but we find no relation in weaker investor protection countries. This finding supports the greater role of firm-specific governance through audits in countries with stronger legal systems (Francis, Khurana, Martin, and Pereira [2006]). To the extent that investors rely on audited financial statements, IRR will be more sensitive to the perceived quality of the audit. When audited financial statements do not play a primary role in investors' decisions (i.e., in countries with weaker investor protection), the quality of the audit will have less of an impact on IRR.

Our results are robust to including an extensive set of control variables. Specifically, in addition to controlling for other audit properties (auditor size and auditor industry specialization), we control for country-level investor protection and disclosure scores, year and industry effects, risk-free interest rates, and six other firm-level variables (firm size, book-to-market ratio, market beta, price momentum, idiosyncratic risk, and analysts' earnings forecast dispersion). In addition, we subject our tests to a number of sensitivity and specification checks. With respect to auditor remuneration, we investigate audit fees versus nonaudit fees for a sample of U.K. and U.S. firms, we examine positive and negative excess fees separately, we control for potential simultaneity between IRR and auditor remuneration, and we examine changes in excess fees. We test whether our results are sensitive to our particular measure of investor protection and to different ways of averaging the four ex ante cost of equity capital measures that make up IRR. Our conclusions are robust to these and several other tests.

In Section 2, we discuss the background for this study and develop hypotheses. In Section 3, we explain the empirical models. In Section 4, we describe the sample. In Section 5, we discuss the main results and our robustness tests. Finally, in Section 6, we provide conclusions.

2. Background and Hypotheses Development

Our study focuses on two research questions: (1) To what extent does auditor remuneration relate to firms' IRR? (2) Does this relation vary based on the strength of investor protection in the firm's country of domicile?

The link between auditor remuneration and IRR can be understood by first considering the role of an audit and its impact on information risk. Audits lend credibility to accounting information by providing independent verification of manager-prepared financial statements (e.g., Simunic and Stein [1987]). Levitt (2000), among others, argues that investors cannot be expected to trust a company's reported financial information without confidence in the auditor's objectivity and fairness. An audit's ability to improve the credibility of financial accounting information lowers investors' perceived information risk (e.g., Boone, Khurana, and Raman [2005]). However, to the extent that investors perceive the audit to be deficient (e.g., lacking auditor independence), the credibility of financial information will decrease and information risk will increase. As this information risk may not be diversified away, the firm's cost of equity capital will increase (Bhattacharya, Daouk, and Welker [2003]; Easley and O'Hara [2004]; Francis, LaFond, Olsson, and Schipper [2004]; Lambert, Leuz, and Verrecchia [2007]).

We examine the role that auditor remuneration may have on the relation between audits and information risk. A line of research starting with DeAngelo (1981) suggests that an auditor's incentive to compromise independence relates to how economically significant the client is to the auditor. This research argues that an auditor concerned about the possible loss of fee revenue is less likely to object to management's accounting choices because of his economic bond with the firm. DeAngelo states that "the existence of client-specific quasi-rents to incumbent auditors ... lowers the optimal amount of auditor independence" (1981, 113). Survey evidence reported by Nelson, Elliott, and Tarpley (2002) and Trompeter (1994) provide support for this argument; the more economically dependent the auditor is on the client, the more likely the auditor is to succumb to client pressure.[1]

As a test of DeAngelo's statements, Magee and Tseng (1990) develop a multiperiod model and find that the auditor's value of incumbency presents a threat to independence under a set of reasonable circumstances. In particular, because many accounting standards require auditor judgment, the potential for differential judgments by different auditors gives rise to the possibility that a positive value of incumbency could lead an auditor to approve a report that, in the auditor's judgment, may be viewed as an audit failure (Magee and Tseng [1990, 317]). Therefore, if high auditor remuneration creates economic bonding and a consequent lack of independence, investors' perceptions of reduced credibility will increase information risk and ultimately raise the firm's cost of equity capital. As a result, we expect to observe a positive relation between excess auditor remuneration and IRR.[2]

As a measure of the potential economic bond between the auditor and the client, we develop a model of excess auditor remuneration using total fees charged by the auditor. One reason for not using the ratio of audit to nonaudit

1. Prior research yields inconsistent conclusions regarding the association between auditor fees and measures of accruals quality. On the one hand, Gul, Chen, and Tsui (2003) and Ahmed, Duellman, and Abdel-Meguid (2006) find a positive association between discretionary accruals and fees. In addition, Choi, Kim, and Zang (2005) conclude that auditors' incentives to compromise audit quality differ systematically for more profitable clients (with positive abnormal fees) in relation to less profitable clients. On the other hand, Ashbaugh, LaFond, and Mayhew (2003) and Chung and Kallapur (2003) do not find such a positive relation. These mixed findings provide additional motivation for why we focus on investors' *perceptions* in this study.

2. Consistent with our prediction, Mansi, Maxwell, and Miller (2004, 756) argue that "audit quality contributes to the credibility of financial disclosure, and ... reduces the cost of [debt] capital."

fees is that nonaudit fee data are not publicly available for most countries. We do not expect this choice to have a material impact on our conclusions as Hansen and Watts (1997) and Reynolds and Francis (2001) argue that audit and nonaudit fees should create similar incentives to the auditor. For example, Reynolds and Francis (2001) note that fee dependence is inherent in auditor-client contracting and that the strength of the economic bond tends not to depend on whether the source of fees is auditing or nonauditing (e.g., consulting).[3] We discuss a robustness check to determine whether our inference is sensitive to using different fee types (i.e., audit vs. nonaudit) using a sample of U.K. and U.S. firms that have detailed auditor remuneration data available. We state our first hypothesis (in alternative form)**[include alternative form in H1?]** as follows:

> H_1: The implied required rate of return on equity capital increases with excess auditor remuneration.

Our next hypothesis examines how the relation between IRR and auditor remuneration varies with the degree of investor protection in a firm's country of domicile. This issue relates to a large literature that documents substantial cross-country differences in the legal protection of investors' rights (e.g., La Porta, Lopez-de-Silanes, Shleifer, and Vishny [1997, 1998, 2000]) and the demand for financial accounting information (e.g., Ball, Kothari, and Robin [2000]; Barniv, Myring, and Thomas [2005]). In general, the demand for financial accounting information increases as the strength of a country's investor protection increases.[4] One reason for this higher demand, according to Bushman and Smith (2001), is that the effectiveness of accounting information in limiting expropriation of minority investors is likely to be greater when investors have stronger legal protection.[5] In other words, when investor protection is stronger, accounting information can play a more prominent role in corporate governance mechanisms. Accordingly, research has shown that investor protection is positively associated with the quality of financial reporting (e.g., Hung [2000]; Ball, Kothari, and Robin [2000]).

With respect to the role of auditing, Bushman and Smith (2001) argue that the economic benefits of financial accounting disclosures increase with the rigor

3. Reynolds and Francis (2001) also note that the level of nonaudit fees for audit clients is usually rather small and that as of 1999, only 3 percent of clients who purchase consulting services from Big 5 auditors have nonaudit (i.e., consulting) fees that exceed audit fees. They argue that these data suggest that audit fee dependence on large clients is a far more pervasive threat to auditor independence than the incremental effects of consulting fee dependency.

4. Clatworthy (2005) documents that financial analysts and fund managers in stronger investor protection countries perceive the annual report to be more useful than do analysts and fund managers in weaker investor protection countries.

5. Reese and Weisbach (2002, 66) note the importance of legal regime as follows: "An implicit but often unrecognized part of any financial contract is the ability of a legal system to enforce it. The quality of legal protection affects the ability of parties to expropriate resources from one another *ex post*, and thus influences the contracts that will be observed *ex ante*. Differences across countries in the quality of protection they provide claimholders should, by this logic, lead to observable differences in financial contracting."

with which the reported numbers are audited (see also Hope [2003]). Ball (2001) goes one step further and argues that in countries with a weaker legal infrastructure, the role of accounting and auditing in contracting is minimal.[6] Consistent with these arguments, Doidge, Karolyi, and Stulz (2007) find evidence that the net payoffs of improved firm-level governance structures are inherently lower in countries with weaker legal institutions because the governance structures lack credibility. Francis, Khurana, and Pereira (2003) find that higher-quality auditing is more likely to exist in countries with stronger investor protection.[7] Furthermore, Francis et al. (2006) show that the demand for auditing is greater in countries with stronger legal systems. This occurs because the credibility of an audit, as a governance mechanism, requires supporting country-level institutions.[8] When those country-level institutions are stronger, investors tend to rely more on an audit to assess the quality of financial statement information. When those country-level institutions are weaker, investors rely on alternative sources of information (e.g., Ball [2001]), and variation in the quality of the audit is less relevant to their decisions.[9]

To summarize, when investor protection is stronger, investors rely to a greater extent on financial accounting information. The greater reliance on accounting information causes investors' decisions to be more sensitive to changes in the perceived credibility of audited financial statements. If investors view higher auditor remuneration as creating economic bonding between the auditor and the client (thus increasing information risk), investors are more likely to respond by requiring a higher cost of equity capital in stronger investor protection countries. In contrast, when investors are less likely to rely on audited financial statements (i.e., in countries with weaker investor protection), the impact of auditor-client bonding is naturally less important to investors' decisions. In these countries, investors rely more heavily on other sources of information, and variation in the credibility of audited financial statements is less meaningful. This suggests a reduced relation between excess auditor remuneration and IRR in weaker investor protection countries. Our second hypothesis (in alternative form) **[does not appear to be stated in alternative form]** follows:

6. In theory, it is conceivable that the opposite may hold. That is, country-level institutions and firm-level governance mechanisms such as auditing could be substitutes. However, as detailed in this section, empirical research supports the notion that these factors primarily are complements rather than substitutes.

7. Francis et al. (2003) also find that higher-quality accounting and auditing are positively associated with financial market development, but only in countries whose legal systems are conducive to the protection of investors.

8. Consistent with these arguments, Fan and Wong (2005) find that the payoffs to adopting independent audits in East Asia are limited. They argue that the opaque business environment in these countries limits the effectiveness of the audit function and that the external audit loses its value when an auditor's adverse opinion does not result in significant consequences (given weaker legal enforcement).

9. Choi, Kang, Kwon, and Zang (2005) show that audit quality has less of an influence on analysts' earnings forecasts accuracy in weaker investor protection environments.

H_2: The positive association between the implied required rate of return on equity capital and excess auditor remuneration increases with the strength of country-level investor protection.

3. Research Design

To test our hypotheses, we estimate the following regression (firm and time subscripts omitted):

$$\begin{aligned} IRR = {} & \beta_0 + \beta_1 ExcessFee + \beta_2 Big4 + \beta_3 IndSpec + \beta_4 InvPro + \beta_5 CIFAR \\ & + \beta_6 lnSize + \beta_7 lnBM + \beta_9 Beta + \beta_9 Mom + \beta_{10} IdRisk + \beta_{11} Disp \\ & + \beta_{12} RFRate + \text{Year and Industry Indicators} + \varepsilon \end{aligned} \tag{1}$$

where the variables are defined as follows:

Implied Required Rate of Return (*IRR*): Since expected (or ex ante) cost of equity capital is not directly observable, recent studies rely on observable measures of *IRR* to examine its determinants (e.g., Khurana and Raman [2004]; Hail and Leuz [2006]).[10] We estimate *IRR* using four models: two implementations of the Ohlson (1995) residual income valuation model (hereafter *RIV* model), the Ohlson and Juettner-Nauroth (2005) model (hereafter *OJ* model), and the *PEG* model (a specific form of the *OJ* model). For all four models, the idea is to substitute price and analysts' earnings forecasts into a valuation equation and to back out *IRR* as the internal rate of return that equates current stock price and the expected future sequence of residual incomes or abnormal earnings (Hail and Leuz [2006]). Because it is not clear which implementation of the valuation model is superior in terms of deriving at a more reliable *IRR*, and to reduce measurement error in the estimates, we use the average of the four *IRR* measures (e.g., Boone, Khurana, and Raman [2005]; Hail and Leuz [2006]).[11] Appendix A provides a detailed discussion of the measurement of *IRR* for each model.

Excess Auditor Remuneration (*ExcessFee*): Our approach to computing excess auditor remuneration follows extant research (e.g., Frankel, Johnson, and Nelson [2002]; Choi, Kim, and Zang [2005]; Hope and Langli [2008]). That is, we regress total auditor fees (*TotFee*) on a large number of explanatory variables and use the residuals from this regression as our proxy for excess fees.[12] The explanatory variables control for normal fees charged by the auditor for a given

10. Gebhardt, Lee, and Swaminathan (2001) and Botosan and Plumlee (2005) point out that tests of the relevance of information for asset valuation require measures of ex ante rather than ex post returns (see also Fama and French [1997]; Vuolteenaho [2002]).

11. As an alternative, we use the first principal component of the four individual *IRR* estimates and find results that are consistent with (and stronger than) those reported.

12. To be specific, for auditor fees, we use the natural log of total auditor remuneration. As described above, this measure includes fees for both audit and nonaudit services. We obtain consistent results when we scale total auditor remuneration by lagged total assets.

level of effort and risk. We are interested in identifying abnormal fees related to economic rent (i.e., threat to independence).

For the explanatory variables, we include two auditor variables—auditor size (*Big4*) and auditor industry specialization (*IndSpec*)—and eleven firm variables—log of market value of equity (*lnSize*), log of book-to-market ratio (*lnBM*), log of sales revenues (*lnSales*), leverage (*Lev*), return on equity (*ROE*), indicator variables for long-term capital issuance (either debt or equity, *CapIssue*), for non-zero foreign operations (*ForOps*), for discontinued operations (*DiscOps*), for acquisitions (*Acq*), a variable measuring intangible asset intensity defined as intangible assets scaled by total assets (*Intangible*), and the sum of inventories and accounts receivable scaled by total assets (*InvRec*).[13]

We estimate *ExcessFee* separately for stronger and weaker investor protection countries.[14] As an additional control for country-level factors, we include a country-level variable that proxies for the extent of litigation auditors face in a particular economy, the Wingate index (see Choi and Wong [2007]).[15] Finally, we control for both time period (year) and industry affiliation (two-digit Standard Industry Codes [SICs]) through indicator variables. We estimate eq. (2) and use the error term (υ) as our measure of *ExcessFee*.

$$\begin{aligned} TotFee = {} & \gamma_0 + \gamma_1 Big4 + \gamma_2 IndSpec + \gamma_3 lnSize + \gamma_4 lnBM + \gamma_5 lnSales + \gamma_6 Lev \\ & + \gamma_7 ROE + \gamma_8 CapIssue + \gamma_9 ForOps + \gamma_{10} DiscOps + \gamma_{11} Acq \\ & + \gamma_{11} Intangible + \gamma_{13} InvRec + \gamma_{14} Wingate \\ & + \text{Year and Industry Indicators} + \upsilon \qquad (2) \end{aligned}$$

Hypothesis 1 would be supported if the coefficient on *ExcessFee* (β_1) in eq. (1) is positive and significant. To test Hypothesis 2, we split the sample into stronger and weaker investor protection groups and test whether the coefficient on *ExcessFee* is more positive in stronger investor protection countries than in weaker investor protection countries.

The remaining variables in eq. (1) control for other factors potentially related to *IRR*. We are interested in the relation between *ExcessFee* and *IRR*, beyond any other factors identified in previous research. For this purpose, we control for auditor type, auditor industry specialization, investor protection, and disclosure levels. We include an extensive list of other control variables to mitigate the concern that our findings, if any, are merely driven by omitted risk

13. We use the natural logarithm of market value of equity, book-to-market ratio, and sales revenues. Using logs of all firm-level variables or not using logs for any variables has no effect on our inferences. All variables used in the study, except for ratios and indicator variables, are translated into Special Drawing Rights. We also consider the effect of client size nonlinearities by adding interaction terms with client size (*lnSize*) to our *ExcessFee* model. There is no noticeable change in the adjusted R^2 of the *ExcessFee* model with this specification, and no inferences are affected.

14. Results are similar and no inferences affected when we instead estimate *ExcessFee* using a pooled model.

15. As an alternative to the Wingate index, we have used *InvPro* or country fixed effects and find results similar to those reported.

proxies. To establish a link between cost of equity capital and a variable of interest (e.g., excess auditor remuneration), it is imperative to control for known risk factors. Specifically, we include six (nonauditing) firm-level control variables and one country-level variable: firm size, book-to-market ratio, market beta, price momentum, idiosyncratic risk, analysts' earnings forecast dispersion, and risk-free interest rate (a country-level variable that varies by year). In addition, we control for year and industry effects.

Auditor Type (Big4): To control for the insurance risk effect of auditing (Khurana and Raman [2004]), we include auditor type (Big 4 versus non–Big 4) in our tests.[16] Given their "deep pockets," Big 4 auditors offer more insurance for the client (e.g., Palmrose [1988]; Dye [1993]).[17] Prior literature further suggests that large auditors tend to provide higher-quality audits to reduce litigation risk and to protect their brand-name reputation (e.g., Becker, DeFond, Jiambalvo, and Subramanyam [1998]). *Big4* equals one if the auditor is a Big 4 audit firm, and zero otherwise.[18]

Auditor Industry Specialization (IndSpec): DeAngelo (1981) notes that the ability of an auditor to detect material error in the financial statements is a function of auditor competence, and auditors that specialize in an industry are likely to be more competent. To the extent that investors' expectations about any material omissions or misstatements decline as the auditor specializes in a particular industry, their perceived level of information risk will decrease. This suggests that investors' perceived level of information risk might be lower when the auditor specializes in the industry the client firm operates in, ceteris paribus. *IndSpec* is measured as the number of clients in that auditor-country-industry-year combination divided by total number of clients of that auditor in that country-year combination.[19]

Investor Protection (InvPro): We use the Legal Enforcement variable from La Porta et al. (1998) to proxy for the level of investor protection in a country. It is measured as the mean score across three legal variables: (1) the efficiency of the judicial system, (2) an assessment of the rule of law, and (3) the corruption index. All three variables range from zero to ten. This proxy for investor protection has been used in several recent studies (e.g., Leuz, Nanda, and Wysocki [2003]; DeFond, Hung, and Trezevant [2007]; Ding, Hope, Jeanjean, and Stolowy [2007]). For example, Leuz, Nanda, and Wysocki (2003) find that

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16. Khurana and Raman (2004) find that U.S. firms audited by Big 4 auditors have lower IRR than those not audited by the Big 4, but they do not find this association in other developed common law countries (i.e., Australia, Canada, and the United Kingdom). They interpret their results to imply that Big 4 auditors provide high-quality audits mainly to avoid costly lawsuits.

17. The insurance effect refers to the investor's ability to recover from auditors the losses sustained by relying on audited financial statements that contain misrepresentations (Menon and Williams [1994]).

18. We use *Big4* to refer to both the current four largest audit firms as well as their predecessors during our sample period (i.e., the Big 6).

19. We use the membership within the broadest industry category ("Sector") among the three levels of I/B/E/S industry classifications.

earnings management (measured at the country level) is decreasing in investor protection. Holding other factors constant, we expect a negative association between *InvPro* and *IRR*.

Corporate Disclosure (CIFAR): Hail and Leuz (2006) find that corporate disclosures reduce cost of equity capital across countries by reducing information asymmetry among stakeholders and hence the equity risk premium demanded by investors. To control for this factor, we include country-level *CIFAR* index scores (CIFAR [1995]), which capture both voluntary and mandatory disclosure levels.[20] We expect a negative coefficient on *CIFAR*.

Firm Size (lnSize): Penman (2004) discusses the importance of liquidity in explaining the cost of equity capital, and Amihud and Mendelson (1986) argue that firm size proxies for liquidity. Firm size is further identified as a risk proxy by Fama and French (1995). We therefore use the natural log of market value of equity as the risk proxy for liquidity and expect a negative association between *IRR* and market value of equity.

Book-to-Market Ratio (lnBM): Fama and French (1993) suggest that *lnBM* may proxy for a "distress factor," because financially distressed firms are likely to have high *lnBM*. Fama and French (1992) and Lakonishok, Shleifer, and Vishny (1994) document a positive association between *lnBM* and realized stock returns. *lnBM* also captures differences in accounting rules between regimes (Joos and Lang [1994]; Hail and Leuz [2006]). Following Gebhardt, Lee, and Swaminathan (2001), Gode and Mohanram (2003), and Hail and Leuz (2006), we thus consider the natural log of book-to-market ratio as one of our risk proxies, and we predict a positive association with *IRR*.[21]

Market Beta (Beta): The Capital Asset Pricing Model predicts a positive association between a firm's beta and its cost of equity capital, and consequently we include *Beta* to control for systematic risk (and expect its coefficient to be positive). We estimate *Beta* by regressing monthly stock returns against the world stock market index in the sixty months preceding the current period.[22] We use the MSCI (Morgan Stanley Capital International) World Index as the measure of the stock market performance around the world.[23]

Stock Price Momentum (Mom): Because our *IRR* estimates rely on analysts' earnings forecasts, which are known to be sluggish in incorporating information

20. The CIFAR (1995) index is based on the inclusion/exclusion of eighty-five financial statement items, divided into the following seven categories: (1) general information, (2) income statement, (3) balance sheet, (4) funds flow statement, (5) accounting policies, (6) stockholders' information, and (7) supplementary information. Within each group, CIFAR computes the percentage of availability of the variable in the annual report of the company. See Hope (2003) for extensive validity tests of the *CIFAR* scores. For our study, we use the average total *CIFAR* score per country.

21. No inferences are affected if we include the growth rate estimated using analysts' one- and two-year ahead earnings forecasts as an additional control variable for growth.

22. To estimate *Beta*, we require at least twenty-four monthly observations be available.

23. Using the MSCI World Index assumes that the capital markets in our sample countries are integrated, which may not be the case. No inferences are affected by excluding *Beta* as a control variable. In addition, as discussed below, we also control for idiosyncratic risk in our regressions.

contained in stock prices, we control for stock price momentum (Guay, Kothari, and Shu [2005]). Guay, Kothari, and Shu (2005) suggest that if analysts are delayed in incorporating good (bad) news contained in recent stock returns, the *IRR* estimates are systematically biased downward (upward). This leads us to predict a negative coefficient on *Mom*, which is the stock return over the previous twelve months.

Idiosyncratic Risk (IdRisk): While *Beta* measures systematic risk, Lehmann (1990) and Malkiel and Xu (1997), among others, present evidence on the importance of idiosyncratic risk (*IdRisk*). Therefore, we include *IdRisk* as a potential risk factor in our tests. Our measure of *IdRisk* is the variance of residuals from the market model regressions (Lehman 1990). If idiosyncratic risk is priced, we expect a positive coefficient on *IdRisk*.

Forecast Dispersion (*Disp*): Following Gebhardt, Lee, and Swaminathan (2001) and Botosan and Plumlee (2005), we consider the dispersion in analysts' earnings forecasts as a potential risk proxy and expect *Disp* to be positively related to *IRR*. We measure the dispersion of forecasts as the standard deviation of the one-year-ahead earnings forecasts scaled by the absolute mean of these forecasts as of September of each year. We obtain the mean forecast from the Institutional Brokerage Estimate System (I/B/E/S) Summary File.

Risk-Free Interest Rate (*RFRate*): *IRR* can vary across countries because of differences in the risk-free interest rate. We control for this by including the Treasury Bill rates or government bond yields from Global Insight and International Monetary Fund (IMF) International Financial Statistics as a proxy for the risk-free interest rate. We expect a positive association between *RFRate* and *IRR*.

Finally, we include indicator variables for time period (year) and industry affiliation (two-digit SIC codes) in all models. Fama and French (1997) show that firms' cost of equity capital can vary systematically across industries. We include year indicators to account for possible year-to-year variations in the *IRR*.

Sample and Descriptive Statistics

Our empirical analysis is based on a sample of firms from fourteen countries from 1995 to 2003. We extract accounting data from *Compustat* North America (U.S. firms) and *Compustat* Global (non-U.S. firms); stock price, analysts' earnings forecasts, and industry identification code from I/B/E/S (all firms); and stock returns from Center for Research in Security Prices (CRSP) (U.S. firms). We use the exchange rate data from IMF International Financial Statistics. In September of each year,[24] we select firm-years that satisfy the following criteria: (1) nonfinancial firm; (2) financial statement data available from *Compustat*; (3) stock price, consensus one-year-ahead and two-year-ahead analysts' earnings forecasts, industry identification code, and number of shares data available from

24. This criterion follows Frankel and Lee (1999).

I/B/E/S; (4) consistency of currency codes between *Compustat* Global and I/B/E/S, and between adjacent years; (5) stock return data available from CRSP or calculated from *Compustat* Global;[25] (6) all of the risk proxies available; (7) book value of equity is positive; (8) positive values for the means of one-year-ahead and two-year-ahead analysts' earnings forecasts;[26] (9) country-level variables available; and (10) necessary auditor data available from *Compustat* North America for U.S. firms and *Compustat* Global for non-U.S. firms.[27] This process yields a final sample of 9,008 firm-year observations (3,273 distinct firms) from fourteen countries.[28]

Descriptive statistics are reported in Table 1. Panel A shows that *IRR* has a mean and median of 0.110 and 0.102, respectively.[29,30] The mean and median of *ExcessFee* are 0.000 (by construction) and −0.007, respectively. *Big4* has a mean of 0.894, indicating that 89.4 percent of our sample firms have a Big 4 auditor. *IndSpec* has a mean value of 0.214, meaning that the auditors in our sample are engaged in approximately five industries on average in a country.

Panel B of Table 1 reports descriptive statistics for *InvPro* and the number of observations per country. We classify Australia, Denmark, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States as stronger investor protection countries. We classify Hong Kong (China), India, Malaysia, Singapore, South Africa, and Spain as weaker investor protection countries. While the distinction between stronger and weaker investor protection is a continuum, we determine a cutoff that leaves adequate sample size for the weaker investor protection group.[31] Many of the countries with the weakest investor protection scores as reported in La Porta et al. (1998) do not require

25. We calculate sum-dividend stock returns for non-U.S. firms from the data of stock prices and dividends extracted from *Compustat* Global.

26. As noted by Gode and Mohanram (2003), empirical implementation of the *OJ* model (and thus also the *PEG* model) requires this condition.

27. Unfortunately, data on auditor remuneration are not widely available in commercial databases. Auditor remuneration data are available for U.S. publicly traded companies in *Compustat* from 2001. As one of our sensitivity analyses, we report results for a subsample of U.K. and U.S. firms that have both audit and nonaudit fee data available.

28. We adjust all per share numbers for stock splits and stock dividends using I/B/E/S adjustment factors. Also, when I/B/E/S indicates that the consensus forecast for that firm-year is on a fully diluted basis, we use I/B/E/S dilution factors to convert those numbers to a primary basis. Furthermore, to mitigate the effects of outliers, we winsorize *IndSpec*, *lnSize*, *lnBM*, *Beta*, *Mom*, *IdRisk*, *lnSales*, *Lev*, *ROE*, *Intangible*, and *InvRec* at the first and ninety-ninth percentiles and *Disp* at the ninety-ninth percentile of the pooled distribution. Other variables are categorical in nature and do not exhibit extreme observations.

29. For illustrative purposes, the mean *IRR* is highest in South Africa (0.156) and India (0.140), and lowest in the Netherlands (0.096). The United States has an *IRR* of 0.103.

30. Unreported statistics show that the *IRR* estimates from the four models are quite close to each other. Specifically, the means of *IRR* from the *RIVC*, *RIVI*, *OJ*, and *PEG* model are 0.082, 0.117, 0.127, and 0.113, respectively, which is close to that reported in previous research (e.g., Chen, Jorgensen, and Yoo [2004]). In addition, all four estimates are positively and significantly correlated with each other (Pearson correlations between 0.47 and 0.96).

31. If we restrict the sample to countries that have at least 100 observations (leaving ten countries) and classify the top (bottom) five countries as stronger (weaker) investor protection, results are very similar to those reported.

TABLE 1

Descriptive Statistics

Panel A: Descriptive statistics for regression variables

Variables	Mean	Q1	Median	Q3	Std. Dev.
IRR	0.110	0.083	0.102	0.129	0.042
ExcessFee	0.000	−0.503	−0.007	0.493	0.795
Big4	0.894	1.000	1.000	1.000	0.307
IndSpec	0.214	0.100	0.193	0.265	0.157
InvPro	9.086	9.200	9.400	9.500	0.881
CIFAR	78.650	76.000	76.000	85.000	4.752
lnSize	19.803	18.691	19.686	20.770	1.597
BM	0.616	0.279	0.476	0.778	0.519
Beta	0.900	0.419	0.778	1.256	0.707
Mom	0.126	−0.200	0.031	0.309	0.578
IdRisk	0.020	0.007	0.013	0.025	0.019
Disp	0.140	0.020	0.050	0.125	0.321
RFRate	0.039	0.016	0.029	0.058	0.028

Note: This table presents the mean, first quartile, median, third quartile, and the standard deviation of variables in eq. (1). *IRR* is the average of four implied required rate of return estimates, that is, *PEG*, *OJ*, *RIVC*, and *RIVI*. *PEG* is the implied required rate of return on equity capital from the *PEG* model. *OJ* is the implied required rate of return on equity capital from the Ohlson-Juettner-Nauroth model. *RIVC* and *RIVI* are the implied required rates of return on equity capital from the *RIV* model. *RIVC* assumes a constant residual income after two periods, and *RIVI* incorporates industry-specific information. See Appendix A for a detailed discussion of each model. *ExcessFee* is excess auditor remuneration computed as the residuals from eq. (2) as reported in Table 4. *Big4* is one if the auditor is one of the Big 4 auditors and zero if not. *IndSpec* is the auditor's industry concentration ratio, measured as the number of clients in the industry-country-year divided by the total number of clients in the country-year. *InvPro* (investor protection) is the legal enforcement score taken from La Porta et al. (1998). *CIFAR* is the country-level disclosure scores from CIFAR (1995). *lnSize* is the natural log of market value of equity as of September of each year, adjusted by the exchange rate of the local currency to Special Drawing Rights. *BM* is the book value of equity divided by market value of equity. In our empirical tests we use the log of *BM*, but for descriptive purposes we present raw values in the table. *Beta* is the systematic risk estimated by regressing at least 24 prior monthly returns up to 60 prior monthly returns against the world stock market index (MSCI World Index). *Mom* is price momentum measured as the previous twelve months' stock return. *IdRisk* is the idiosyncratic risk, which is measured as the variance of residuals from the *Beta* regressions. *Disp* is the dispersion of analysts' earnings forecasts, measured as the standard deviation of the one-year-ahead earnings forecasts scaled by the absolute mean of these forecasts. *RFRate* is the Treasury Bill rates or government bond yields from Global Insight and IMF International Financial Statistics. The number of observations is 9,008.

(*continued*)

TABLE 1 (*Continued*)

Panel B: *InvPro* and number of observations per country

Country	*N*	*InvPro*	Weaker/Stronger *InvPro*
Australia	647	9.4	Stronger
Denmark	172	10.0	Stronger
Hong Kong, China	199	8.9	Weaker
India	218	5.6	Weaker
Malaysia	587	7.7	Weaker
Netherlands	10	10.0	Stronger
Norway	148	10.0	Stronger
Singapore	421	8.9	Weaker
South Africa	286	6.4	Weaker
Spain	5	7.1	Weaker
Sweden	88	10.0	Stronger
Switzerland	4	10.0	Stronger
United Kingdom	2,333	9.2	Stronger
United States	3,890	9.5	Stronger
	9,008		

Source: La Porta et al. 1998.

Note: InvPro: Country-level investor protection scores from La Porta et al. (1998). *InvPro* is measured as the mean score across three legal variables in La Porta et al. (1998): (1) the efficiency of the judicial system; (2) an assessment of the rule of law; and (3) the corruption index. All three variables range from zero to ten.

public disclosure of auditor remuneration and therefore do not make our sample. This works against us finding support for Hypothesis 2.

As is common when using samples from different countries, sample sizes vary greatly across countries (Table 1, Panel B). We deal with this issue in the following ways. First, our focus is not on each country per se, but rather auditor remuneration and the level of investor protection in a given country. Thus we pool observations from different countries into stronger and weaker investor protection groups for our tests of Hypothesis 2. Second, in addition to ordinary least squares (OLS), we report results using country-weighted least squares (WLS), where the weight is inversely proportional to the number of observations per country. Using WLS ensures that uneven country representation in our sample will not bias our results toward countries that are more heavily represented. Third, we report results of alternative sample choices in which we require a minimum number of observations per country. Finally, given that the United States accounts for such a large portion (43 %) of the sample, we repeat tests excluding U.S. observations.

A Pearson correlation matrix of the regression variables is shown in Table 2. *IRR* is significantly positively correlated with *ExcessFee*. This finding provides univariate support for Hypothesis 1. *IRR* is negatively correlated with *Big4*, *InvPro*, *CIFAR*, *lnSize*, and *Mom* and is positively correlated with *lnBM*, *IdRisk*, *Disp*, and *RFRate*. These correlations are in the predicted direction. *IRR* is positively correlated with *IndSpe* and is not significantly correlated with *Beta*. By construction, *ExcessFee* is uncorrelated with the variables included in the *ExcessFee* model in eq. (2). Correlation results should be interpreted cautiously as they do not control for differences in firm characteristics over time or in the cross section. Consequently, we now turn to multivariate test results.

5. Results

In this section, we first provide results of "validity tests" of our *IRR* measure. Then we discuss our model to compute *ExcessFee* before presenting results of our hypotheses tests. Finally, we subject our results to a battery of sensitivity analyses. Reported significance levels are two-sided and based on Newey-West standard errors that correct for both heteroskedasticity and autocorrelation (Newey and West [1987]).

5.1 *IRR* Estimates and Risk Proxies

The purpose of this section is to validate the *IRR* measure by showing that it relates to proxies capturing various sources of risk. As in Botosan (1997), Botosan and Plumlee (2005), and Hail and Leuz (2006), we regress *IRR* on risk proxies that have been used in prior literature. Results are presented in Table 3. With the exception of *Beta*, which is not significant, all variables are highly significant and have signs that are consistent with theory or prior research. Overall, the

TABLE 2

Pearson Correlation Matrix

	IRR	*ExcessFee*	*Big4*	*IndSpec*	*InvPro*	*CIFAR*	*lnSize*	*lnBM*	*Beta*	*Mom*	*IdRisk*	*Disp*
ExcessFee	0.061											
Big4	−0.088	*0.000*										
IndSpec	0.059	*0.000*	−0.185									
InvPro	−0.176	0.113	0.361	−0.135								
CIFAR	−0.030	0.081	0.163	0.112	0.302							
lnSize	−0.416	*0.000*	0.174	−0.162	0.098	−0.167						
lnBM	0.533	*0.000*	−0.075	0.061	−0.106	−0.085	−0.383					
Beta	*−0.008*	*0.020*	0.079	0.067	0.071	−0.076	*0.014*	0.031				
Mom	−0.281	*−0.027*	0.037	−0.029	0.064	*−0.009*	0.097	−0.314	0.059			
IdRisk	0.080	*−0.006*	*0.012*	−0.028	*−0.014*	−0.253	−0.158	0.025	0.499	0.166		
Disp	0.232	0.039	*0.001*	0.040	−0.049	*0.006*	−0.192	0.272	0.132	−0.084	0.140	
RFRate	0.247	0.021	−0.231	0.287	−0.575	0.241	−0.227	0.032	−0.231	−0.159	−0.250	0.050

Note: This table presents the Pearson correlations between variables in eq. (1). Please see the notes to Table 1 for explanation of variables. The number of observations is 9,008. Other than the italicized correlation coefficients, all correlations are significant at the 5 percent level or better (two-tailed).

TABLE 3

Regression of *IRR* on Risk Proxies

Variables	Pred.	Coef.	*t*-Stat.
lnSize	–	−0.0061***	−22.20
lnBM	+	0.0143***	21.42
Beta	+	0.0001	0.17
Mom	–	−0.0078***	−10.77
IdRisk	+	0.0979***	3.37
Disp	+	0.0151***	8.18
RFRate	+	0.0047***	22.42
Intercept		0.0824***	15.04
Adj. R^2		0.44	
N		9,008	

Note: This table presents the results of an OLS regression of *IRR* on risk proxies for the pooled sample. The regression equation is as follows:

$$IRR = \beta_0 + \beta_1 lnSize + \beta_2 lnBM + \beta_3 Beta + \beta_4 Mom + \beta_5 IdRisk + \\ + \beta_6 Disp + \beta_7 RFRate + \text{Year and Industry Indicators} + \varepsilon$$

Please see notes to Table 1 for explanations of variables. Year and industry indicators are included but not reported. The *t*-statistics are based on Newey-West standard errors (Newey and West [1987]).

*** indicates significance at the 1 percent level (two-tailed).

model explains 44 percent of the variation in *IRR* for our sample of firms. These regression results suggest that our estimate of *IRR* relates to risk proxies in a predictable manner, which provides reasonable assurance that our measure of *IRR* is a reliable proxy for the unobservable ex ante cost of equity capital.[32]

5.2 Estimation of Excess Fees

In estimating excess auditor fees, it is important that our model does not omit variables related to normal fees charged by the auditor for the level of work or risk of the client. While one may consider the possibility that auditors bond with their clients based on normal fees, we do not consider that issue in our paper. We are interested in fees that cannot be explained by normal factors related to the level of audit effort and risk. To do this, we carefully consider a number of factors that likely relate to normal auditor fees (see previous discussion of eq. (2)). Table 4

32. Frankel and Lee (1999) and Chen, Jorgensen, and Yoo (2004) find that equity value estimates derived from models similar to ours are reliable in their international samples (of twenty and seven countries, respectively). Untabulated results show that the adjusted R^2 of our *IRR* model is 43 percent and 50 percent in stronger and weaker investor protection countries, respectively, and all significant relations hold in both subsamples.

TABLE 4

Estimation of Excess Auditor Remuneration (*ExcessFee*)

Variables	Pred.	Coef.	t-Stat.
Big4	+	0.4734***	14.11
IndSpec	+	0.4800***	6.62
lnSize	+	0.4502***	48.31
lnBM	+	0.3822***	25.42
lnSales	+	0.1871***	30.14
Lev	+	0.8645***	11.59
ROE	−	−0.1668***	−4.02
CapIssue	+	0.0577***	2.93
ForOps	+	0.3362***	16.38
DiscOps	+	0.3680***	10.31
Acq	+	0.0130	0.52
Intangible	+	0.3561***	4.95
InvRec	+	0.6920***	10.54
Wingate	+	0.1293***	32.48
Intercept		−7.6176***	−60.29
Adj. R^2		0.72	
N		9,008	

Note: This table presents the results of the pooled OLS regression for the following equation:

$$TotFee = \gamma_0 + \gamma_1 Big4 + \gamma_2 IndSpec + \gamma_3 lnSize + \gamma_4 lnBM + \gamma_5 lnSales + \gamma_6 Lev + \gamma_7 ROE + \gamma_8 CapIssue + \gamma_1 ForOps + \gamma_{10} DiscOps + \gamma_{11} Acq + \gamma 12 Intangible + \gamma 13 InvRec + \gamma 14 Wingate + \text{Year and Industry Indicators} + \upsilon$$

We compute *ExcessFee* (used in subsequent tables of hypotheses testing) as the residuals from this model. The estimation is done separately for stronger and weaker investor protection countries. Please see notes to Table 1 for explanations of variables except the following. *TotFee* is the natural log of total auditor remuneration translated into Special Drawing Rights. *lnSales* is the natural logarithm of sales revenues, adjusted by the exchange rate of the local currency to Special Drawing Rights. *Lev* is long-term debt scaled by total assets, and *ROE* is the return on equity. *CapIssue*, *ForOps*, *DiscOps*, and *Acq* are indicator variables for long-term capital issuance (either debt or equity), for non-zero foreign operations (measured as non-zero foreign income tax expense), for discontinued operations, and for acquisitions, respectively. *Intangible* is intangible assets scaled by total assets. *InvRec* is the sum of inventories and accounts receivable scaled by total assets. *Wingate* is a country-level variable that proxies for the extent of litigation auditors face in a country. Year and industry indicators are included but not reported. The t-statistics are based on Newey and West (1987) standard errors.

*** indicates significance at the 1 percent level (two-tailed).

shows the results of our *ExcessFee* model. The model, which includes fourteen explanatory variables plus industry and year fixed effects, has high explanatory power, with an adjusted R^2 of 72 percent.[33] The high R^2 increases our confidence

33. For brevity we show only the results for the full sample. As explained above, we estimate the model separately for stronger and weaker investor protection groups. Unreported results show that the model behaves similarly in the two groups and achieves similar explanatory power (with adjusted R^2s of 0.74 and 0.75 for stronger and weaker investor protection countries, respectively).

that we are appropriately controlling for a large amount of the normal fees. If we had obtained a low R^2, then our model would be more likely to suffer from omitted variables, as a large portion of auditor remuneration should be normal. We are comforted by the fact that auditor remuneration relates to the fee determinant variables in the expected direction. As predicted, auditor remuneration is significantly and positively associated with *Big4*, *IndSpec*, *lnSize*, *lnBM*, *lnSales*, *Lev*, *CapIssue*, *ForOps*, *DiscOps*, *Intangible*, *InvRec*, and *Wingate*, and is negatively related to *ROE*. As explained above, our model controls for year and industry fixed effects (not shown in Table 4).[34]

We can never rule out the possibility that our *ExcessFee* measure contains a normal component, but the high explanatory power of the model provides reasonable evidence that we appropriately capture excess fees. In addition, we report several other sensitivity tests on this issue later in the paper. These tests further increase our confidence that our model is well specified and that its conclusions are reliable.

5.3 Results of Hypotheses Tests

5.3.1 Tests of Hypothesis 1

We first examine whether excess auditor remuneration can explain differences in *IRR*, after controlling for risk proxies previously introduced into the model and controlling for other audit properties and country-level investor protection and disclosure scores. As discussed, we are interested in testing whether excess fees reduce investors' perceptions of auditor independence, leading to diminished credibility of financial information and increased information risk.

Results for the full sample of firms are presented in Table 5. We present four sets of results: (1) OLS excluding *CIFAR*, (2) OLS including *CIFAR*, (3) WLS excluding *CIFAR*, and (4) WLS including *CIFAR*. The potential advantage of using WLS versus OLS is discussed earlier and relates to differences in sample sizes across countries. The motivation for including and exluding *CIFAR* scores relates to their potential lack of relevance to our sample period. These scores are generated based on disclosures in the early 1990s, and disclosure practices may have changed between then and our sample period.

The first column shows results of OLS regressions that exclude *CIFAR*. The risk proxies continue to be significant in the predicted direction (with the exception of *Beta*). *IndSpec* is significantly negatively associated with *IRR*, suggesting

34. One would expect the cross-sectional variation of normal fees to be greater than the cross-sectional variation in excess fees. Consistent with this expectation, we find that the difference between the third and first quartile for normal fees is more than twice as large as it is for *ExcessFee*. We would also expect excess fees to be relatively constant across years for a given firm. For firms that have multiple observations, we determine the extent to which the sign of their *ExceeFee* remains the same in the following year. We find that 82 percent of firms keep the same sign of excess fees from one year to the next. These results give us additional confidence that *ExcessFee* captures remuneration other than normal fees related to effort and risk.

TABLE 5

Tests of the Relation between Implied Required Rate of Return (*IRR*) and Excess Auditor Remuneration (Hypothesis 1), Controlling for both Country- and Firm-Level Factors: Full Sample

	OLS without CIFAR		OLS with CIFAR		Country WLS without CIFAR		Country WLS with CIFAR	
	Coef.	*t*-Stat.	Coef.	*t*-Stat.	Coef.	*t*-Stat.	Coef.	*t*-Stat.
ExcessFee	0.0028***	5.70	0.0028***	5.68	0.0036***	6.86	0.0036***	6.99
Big4	0.0006	0.46	0.0010	0.79	−0.0003	−0.24	0.0003	0.18
IndSpec	−0.0103***	−3.60	−0.0103***	−3.63	−0.0138***	−4.42	−0.0135***	−4.35
InvPro	−0.0086***	−16.02	−0.0082***	−15.01	−0.0080***	−14.61	−0.0075***	−13.08
CIFAR			−0.0003**	−2.26			−0.0004***	−3.05
lnSize	−0.0062***	−22.51	−0.0063***	−22.58	−0.0059***	−19.93	−0.0061***	−20.06
lnBM	0.0144***	21.89	0.0143***	21.60	0.0141***	20.80	0.0140***	20.55
Beta	0.0002	0.35	0.0003	0.44	0.0005	0.74	0.0006	0.88
Mom	−0.0076***	−10.52	−0.0076***	−10.55	−0.0061***	−8.39	−0.0061***	−8.43
IdRisk	0.0938***	3.24	0.0851***	2.92	0.0502*	1.73	0.0393	1.34
Disp	0.0149***	8.06	0.0150***	8.12	0.0164***	9.14	0.0164***	9.15
RFRate	0.0048***	18.72	0.0050***	18.25	0.0051***	18.55	0.0053***	18.20
Intercept	0.1820***	26.65	0.1993***	18.49	0.1785***	25.13	0.2047***	17.96
Adj. R^2	0.44		0.44		0.46		0.46	
N	9,008		9,008		9,008		9,008	

Note: This table presents the results of ordinary least squares (OLS) and country-weighted least squares (WLS) regressions for the following equation:

$$IRR = \beta_0 + \beta_1 ExcessFee + \beta_2 Big4 + \beta_3 IndSpec + \beta_4 InvPro + \beta_5 CIFAR + \beta_6 lnSize + \beta_7 lnBM + \beta_8 Beta + \beta_9 Mom + \beta_{10} IdRisk + \beta_{11} Disp + \beta_{12} RFRate + \text{Year and Industry Indicators} + \varepsilon$$

Please see notes to Table 1 for explanations of variables. Year and industry indicators are included in all regressions but not reported. The *t*-statistics are based on Newey and West (1987) standard errors.

***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively (two-tailed).

that auditors with industry expertise (and thus higher competence) may be better at reducing information risk than other auditors. *Big4* is not significantly related to *IRR*. *InvPro* is negative and significant. Our focus, however, is on *ExcessFee*, which is positive and significant at the 1 percent level. This result is consistent with Hypothesis 1 and the univariate finding. The finding supports the notion that the stronger the potential economic bond between the audit firm and its client, the greater the risk perceived by investors and hence the higher the required rate of return on equity capital.

The second column repeats the analysis after adding the control for country-level disclosure, *CIFAR*. *CIFAR* is significantly negatively related to *IRR*, consistent with greater disclosure reducing the cost of capital. More important, *ExcessFee* continues to be significantly positively associated with *IRR*. The thrid and fourth columns (with and without *CIFAR*, respectively) show that excess remuneration is even more strongly positively associated with *IRR* when using WLS.

The conclusion from these regression results is that excess auditor remuneration, which proxies for the extent of economic bonding (and hence reduced auditor independence), is significantly positively associated with our ex ante proxy for the cost of equity capital, *IRR*. These results support Hypothesis 1.

5.3.2 Tests of Hypothesis 2

We next split the sample based on investor protection and test whether *ExcessFee* has a differential relation with *IRR* in stronger versus weaker investor protection countries. The regression results for each subsample are reported in Table 6. We later report sensitivity analyses regarding both our proxy for investor protection and our classification of firms into stronger and weaker countries.

Panel A of Table 6 shows that for all four regression specifications for the stronger investor protection group (OLS and WLS, excluding and including *CIFAR*), *ExcessFee* is positively and significantly related to *IRR*. Conversely, Panel B shows that in all four models for the weaker investor protection group, the coefficient on *ExcessFee* is small and not significant. Furthermore, for all four tests, the coefficient on *ExcessFee* is significantly larger for the stronger investor protection group than for the weaker investor protection group, with *t*-statistics between 2.46 and 3.75.[35,36]

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35. In the reported results, we split the sample based on stronger versus weaker investor protection. As a sensitivity analysis, we add *InvPro* to the regressions and let *InvPro* vary within each group. Results are consistent with those reported in Table 6.

36. To further ensure that our results are not affected by the fact that significantly more observations are included in the stronger than in the weaker investor protection group, we randomly select the same number of observations from the stronger investor protection group as we have observations for the weaker investor protection group (i.e., $N = 1{,}716$) and repeat the tests. Results are very similar to those reported and suggest that sample size differences do not explain our tabulated results.

TABLE 6

Tests of the Relation between Implied Required Rate of Return (*IRR*) and Excess Auditor Remuneration Conditional on the Degree of Investor Protection (Hypothesis 2)

Panel A. Subsample of stronger investor protection countries

	OLS without CIFAR		OLS with CIFAR		Country WLS without CIFAR		Country WLS with CIFAR	
	Coef.	*t*-Stat.	Coef.	*t*-Stat.	Coef.	*t*-Stat.	Coef.	*t*-Stat.
ExcessFee	0.0035***	6.78	0.0037***	7.09	0.0045***	7.89	0.0045***	7.90
Big4	0.0041***	3.04	0.0046***	3.40	0.0031**	2.04	0.0033**	2.16
IndSpec	−0.0065*	−1.77	−0.0050	−1.33	−0.0096**	−2.20	−0.0090**	−2.05
CIFAR			0.0006**	4.11			0.0002	1.34
lnSize	−0.0065***	−21.90	−0.0065***	−21.78	−0.0059***	−17.85	−0.0058***	−17.81
lnBM	0.0125***	18.60	0.0128***	18.85	0.0130***	18.04	0.0130***	18.08
Beta	−0.0006	−0.88	−0.0005	−0.66	−0.0001	−0.14	−0.0001	−0.10
Mom	−0.0083***	−10.48	−0.0080***	−10.22	−0.0060***	−7.41	−0.0059***	−7.35
IdRisk	0.0727**	2.31	0.0790**	2.51	0.0474	1.48	0.0491	1.53
Disp	0.0161***	7.58	0.0159***	7.44	0.0170***	8.30	0.0170***	8.27
RFRate	0.0033***	5.56	0.0027***	4.26	0.0043***	5.55	0.0041***	5.00
Intercept	0.1220***	9.24	0.0750***	4.34	0.1350***	16.03	0.1162***	7.16
Adj. R^2	0.43		0.43		0.45		0.45	
N	7,292		7,292		7,292		7,292	

Panel B. Subsample of weaker investor protection countries

	OLS without CIFAR		OLS with CIFAR		Country WLS without CIFAR		Country WLS with CIFAR	
	Coef.	*t*-Stat.	Coef.	*t*-Stat.	Coef.	*t*-Stat.	Coef.	*t*-Stat.
ExcessFee	−0.0011	−0.89	0.0004	0.35	−0.0006	−0.47	0.0009	0.78
Big4	−0.0126***	−4.48	−0.0030	−0.97	−0.0105***	−3.79	−0.0017	−0.56
IndSpec	−0.0171***	−3.25	−0.0112**	−2.13	−0.0160***	−3.13	−0.0100*	−1.93
CIFAR			−0.0015***	−5.96			−0.0016***	−5.97
lnSize	−0.0057***	−5.45	−0.0063***	−5.97	−0.0056***	−5.33	−0.0062***	−5.80
lnBM	0.0202***	10.26	0.0200***	9.94	0.0188***	9.90	0.0187***	9.63
Beta	−0.0040*	−1.92	0.0001	0.03	−0.0035*	−1.73	0.0001	0.06
Mom	−0.0082***	−4.15	−0.0081***	−4.15	−0.0089***	−4.68	−0.0089***	−4.72
IdRisk	0.1979**	2.58	0.1524**	2.02	0.1903**	2.50	0.1437*	1.92
Disp	0.0101***	2.68	0.0096**	2.53	0.0123***	3.51	0.0119***	3.38
RFRate	0.0067***	15.62	0.0068***	16.17	0.0069***	16.18	0.0070***	16.74
Intercept	0.1269***	12.64	0.2368***	10.90	0.1224***	12.19	0.2362***	10.70
Adj. R^2	0.48		0.49		0.49		0.50	
N	1,716		1,716		1,716		1,716	
Difference in coefficient on *ExcessFee* between stronger (Panel A) and weaker (Panel B) investor protection countries								
	0.0046***	3.38	0.0033**	2.46	0.0051***	3.75	0.0036***	2.70

Note: Panel A (Panel B) presents the results of ordinary least squares (OLS) and country-weighted least squares (WLS) regressions of the following equation (with and without CIFAR) for the sample within the countries with stronger (weaker) investor protection. Please see notes to Table 1 for explanations of variables.

$$IRR = \beta_0 + \beta_1 ExcessFee + \beta_2 Big4 + \beta_3 IndSpec + \beta_4 CIFAR + \beta_5 lnSize + \beta_6 lnBM + \beta_7 Beta + \beta_8 Mom + \beta_9 IdRisk + \beta_{10} Disp + \beta_{11} RFRate + Year\ and\ Industry\ Indicators + \varepsilon$$

Year and industry indicators are included in all regressions but not reported. The *t*-statistics are based on Newey and West (1987) standard errors.

***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively (two-tailed).

The results reported in this section support Hypothesis 2 and suggest that investors view economic bonding as more serious in high investor protection countries than in low investor protection countries. Our findings are consistent with the arguments in Bushman and Smith (2001), Ball (2001), Francis, Khurana, and Pereira (2003), and Francis et al. (2006) that auditing plays a lesser role in environments that lack the "enabling" country-level institutions. In other words, it is primarily in environments in which those country-level institutions are stronger that investors tend to rely on an audit to assess the quality of financial statement information. Thus, the negative effect of bonding between the auditor and client firm is perceived as relatively more detrimental in stronger investor protection countries.

In addition to providing support for our second hypothesis, the results reported above can be interpreted as lending additional support to our findings for Hypothesis 1. That is, although our excess fee model includes a large number of variables and exhibits high explanatory power, it is always possible that our model does not fully control for normal fees. In this case, the positive relation between *ExcessFee* and *IRR* may relate to *IRR* representing an additional "work" variable. Firms with higher *IRR* are riskier and therefore normally require more audit effort, and more audit effort leads to higher fees. While this reasoning still leads to a positive relation between *ExcessFee* and *IRR* as predicted by Hypothesis 1, causality is in the opposite direction to that discussed. If our finding for *ExcessFee* reflects issues related to effort and risk for which we do not fully control in the *ExcessFee* model, the same should hold in both stronger and weaker investor protection countries. The fact that we observe a significantly stronger relation in countries in which we predict a stronger relation increases our confidence in the results and conclusions.

5.4 Robustness Tests

Although we report several specifications of our models above, in this section, we subject our findings to a number of further robustness and specification checks. In particular, we report on sensitivity analyses related to our test variable (*ExcessFee*), our partitioning variable (*InvPro*), and several other robustness tests.[37]

5.4.1 Auditor Remuneration

Given the importance of *ExcessFee* in our tests, we discuss results of five different sensitivity analyses related to auditor remuneration.

5.4.1.1 Audit versus nonaudit fees. Table 7 reports the results for a sample of 533 U.K. and 1,562 U.S. observations that have available data for both audit

37. For brevity, we tabulate only the results of the first sensitivity analysis. Other robustness results are available from the authors upon request.

and nonaudit fees (N = 2,095).[38] The results show that whereas both excess audit fees and excess nonaudit fees are positively associated with *IRR*, only excess audit fees are significant at conventional levels. These results provide support for using total remuneration in our analyses.

TABLE 7

Tests of the Relation between Implied Required Rate of Return (*IRR*) and Excess Audit and Excess Nonaudit Remuneration for Subsample of U.K. and U.S. Firms

	Excess Audit Fee Model		Excess Nonaudit Fee Model	
	Coef.	*t*-Stat.	Coef.	*t*-Stat.
ExcessAuditFee	0.0045***	4.40		
ExcessNonAuditFee			0.0006	1.19
Big4	0.0040	1.25	0.0042	1.30
IndSpec	−0.0153*	−1.95	−0.0138*	−1.75
lnSize	−0.0049***	−8.96	−0.0049***	−8.81
lnBM	0.0129***	10.97	0.0128***	10.76
Beta	−0.0003	−0.31	−0.0005	−0.48
Mom	−0.0048***	−3.70	−0.0050***	−3.74
IdRisk	0.0618	1.32	0.0785*	1.65
Disp	0.0118***	3.44	0.0121***	3.50
RFRate	0.0025**	2.53	0.0019*	1.88
Intercept	0.1669***	22.49	0.1707***	22.87
Adj. R^2	0.42		0.42	
N	2,095		2,095	

Note: This table presents results of ordinary least squares (OLS) regressions for a subsample of U.K. and U.S. firms that have data available regarding the breakdown of total auditor remuneration into both audit and nonaudit fees in *FAME* and *Compustat*, respectively.

$$IRR = \beta_0 + \beta_1 ExcessAuditFee\ (\beta_1 ExcessNonAuditFee) + \beta_2 Big4 + \beta_3 IndSpec + \beta_4 lnSize + \beta_5 lnBM + \beta_6 Beta + \beta_7 Mom + \beta_8 IdRisk + \beta_9 Disp + \beta_{10} RFRate + \text{Year and Industry Indicators} + \varepsilon$$

Please see notes to Table 1 for explanations of variables other than *ExcessAuditFee* and *ExcessNonAuditFee*. *ExcessAuditFee* (*ExcessNonAuditFee*) is the excess audit fees (nonaudit fees) computed as the residuals from eq. (2), in which audit fees (nonaudit fees) are used as a dependent variable. Year and industry indicators are included in all regressions. The *t*-statistics are based on Newey and West (1987) standard errors.

***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively (two-tailed).

38. The U.K. data are from the *FAME* database, and we thank Mark Clatworthy for providing these data. The U.S. data are from *Compustat*. For simplicity, we use the same explanatory variables (i.e., eq. (2)) for both excess audit and excess nonaudit fees.

5.4.1.2 Potential simultaneity between IRR and auditor remuneration. We have implicitly assumed that auditor remuneration is not affected by the firm's cost of equity capital. This may not be the case and we deal with the issue that *IRR* and auditor remuneration may be simultaneously determined by estimating a two-stage least squares (2SLS) model. In the first stage, we regress total auditor remuneration on all the variables previously included in eq. (2) as well as *IRR*. Untabulated results show that *IRR* does not load significantly as an explanatory variable for auditor remuneration. More important, controlling for this potential simultaneity does not alter the result in the second-stage equation: auditor remuneration is positively associated with *IRR* at the 1 percent level. This result suggests that our finding is not confounded by possible simultaneity between *IRR* and excess auditor remuneration.

5.4.1.3 Separate estimations with positive and negative ExcessFee. If *ExcessFee* appropriately captures economic rents associated with perceived lack of independence, then we are more likely to observe a positive relation between *ExcessFee* and *IRR* when *ExcessFee* is positive. Bonding is less likely to occur for any level of negative *ExcessFee*. Therefore, a relation between *ExcessFee* and *IRR* is expected when *ExcessFee* is negative. If *ExcessFee* captures additional work required for riskier clients, then the positive relation between *ExcessFee* and *IRR* should hold whether *ExcessFee* is positive or negative. Under this scenario, negative *ExcessFee* would simply suggest lower fees charged for a less risky client. The more negative *ExcessFee*, the less risky the firm and the less work required of the auditor.[39]

We reestimate eq. (1) separately for positive and negative values of *ExcessFee*. For the subsample with positive values of *ExcessFee*, we find a positive and significant (at the 1 percent level) coefficient on *ExcessFee*. In contrast, for the subsample with negative values of *ExcessFee*, we find a negative and insignificant coefficient on *ExcessFee*. Finding a significant relation only for the positive *ExcessFee* subsample supports our main conclusions that excess auditor remuneration influences *IRR*.[40] An economic bond between the auditor and the client is more likely to occur when excess auditor remuneration is positive. As the extent of positive excess remuneration increases, so too does the strength of the auditor-client bonding. Because negative excess fees are not expected to create auditor-client bonding, *IRR* should not vary with the extent of negative

39. As an example of this test in prior research, see Choi, Kim, and Zang (2005). They find that audit quality (measured as unsigned discretionary accruals) is negatively associated with abnormal audit fees for the subsample of clients with positive abnormal fees. For the subsample of clients with negative abnormal fees, no association is found.

40. As an alternative test, we have ranked observations into quintiles based on the magnitude of *ExcessFee*. We then omit the middle quintile (as it is hard to argue that very small positive excess fees give rise to different incentives than very small negative excess fees), and compare the top and bottom two quintiles. We find similar results as those reported in the text.

excess remuneration. *ExcessFee* does not appear to be capturing additional audit work related to *IRR*.

5.4.1.4 Potential effects of the Sarbanes-Oxley Act of 2002. Sarbanes-Oxley Act of 2002 (SOX) came into effect in 2002 and may have affected auditor fees, especially in the United States (and possibly elsewhere). Consistent with that possibility, untabulated statistics show that mean auditor fees are significantly higher in the post-SOX period (2002–2003) than in the pre-SOX period (1995–2001). Recall, however, that both our models for excess fees and *IRR* already include year controls. Nevertheless, to control for the potential effects of SOX, we estimate excess fees separately in the pre- and post-SOX periods and repeat the tests. Again, no inferences are changed.

5.4.1.5 Controlling for last year's auditor fees. As a final test related to auditor remuneration, we repeat the analyses after controlling for last year's auditor fees in the excess fee model (which effectively makes it a changes specification). Requiring data on lagged fees reduces the sample to 5,831 observations. *ExcessFee* continues to be significantly and positively associated with *IRR* in this smaller sample, and the association is significant (insignificant) for stronger (weaker) investor protection countries.

5.4.2 Investor Protection

Next, we test the robustness of our Hypothesis 2 result to the choice of investor protection measure. In particular, following Francis et al. (2006), we replace *InvPro* with the level of economic development, measured as gross domestic product (GDP) per capita per country. As an alternative, we employ the security regulation measure used in Hail and Leuz (2006) instead of *InvPro*. Untabulated results show that our inferences for both Hypothesis 1 and Hypothesis 2 are unaltered. *ExcessFee* continues to be positively and significantly associated with *IRR* after controlling for economic development (security regulation). The coefficient on *ExcessFee* for the higher economic development (security regulation) sample is positive and significant, whereas the coefficient for the lower economic development (security regulation) sample is insignificant (and the difference in coefficients is significant at the 1 percent level).

5.4.3 Other Robustness Tests

5.4.3.1 Further controls for sample size differences across countries. We conduct additional analyses to confirm that our Hypothesis 2 results are not driven by sample size differences across countries. We first restrict the sample to countries that have at least 100 observations (leaving ten countries) and classify the top (bottom) five countries as stronger (weaker) investor protection. As a second test, because the United States has the highest number of observations and is included in the stronger investor protection group, we repeat the analysis excluding the United States. No inferences are affected in these two sensitivity tests.[41]

5.4.3.2 Alternative control for sample period difference. Although we include year indicators in all our regressions and report results excluding U.S. observations, our U.S. sample covers only years 2001 to 2003 due to auditor remuneration data availability. This limitation can raise a concern that the U.S. sample is not comparable to the other samples. To this end, we reestimate our main regression using only observations from years 2001 to 2003. In this subsample of observations that represents all fourteen of our sample counries, our results remain robust.

5.4.3.3 Excluding firms cross-listed in the United States. All non-U.S. firms that cross-list in the United States are exposed to the U.S. legal system (e.g., Hope, Kang, and Zang [2007]). Thus, as a sensitivity analysis, we exclude all such firms from our sample. This reduces our sample size to 8,754 observations.[42] Results are similar to those reported and no inferences are affected.

5.4.3.4 Alternative controls for auditor type. As alternative controls for auditor type, we first reestimate the regressions using only firms that are audited by Big 4 auditors (N = 8,057).[43] Second, we control for potential endogeneity in *Big4* using an auditor selection model similar to the one in Khurana and Raman (2004). No inferences are affected in these sensitivity analyses.

5.4.3.5 Controls for analysts' forecast bias and forecast accurcay. First, we include forecast bias as an additional control variable in our regressions. Second, we compute analysts' forecast accuracy-weighted *IRR* estimates, giving more weight to observations with higher forecast accuracy and reducing the influence of estimates of inputs with relatively noisy inputs (see Hail and Leuz [2006]). For both robustness checks, inferences are unaffected.

Collectively, the evidence presented in Tables 5–7 and the additional sensitivity analyses described above suggest that excess auditor remuneration is

41. We also compute results for the U.S. sample alone (untabulated). The estimated coefficient on *ExcessFee* is positive (0.005) and significant at the 1 percent level (and is significantly greater than the coefficient for the weaker investor protection group).

42. The percentage reduction in the sample size is almost identical between stronger and weaker investor protection countries. Specifically, the sample excluding cross-listed firms includes 7,083 and 1,671 observations from stronger and weaker investor protection countries, respectively.

43. We repeat the analysis for firms that switch (do not switch) auditor. Untabulated results show that *ExcessFee* is positive and significant in both subsamples, mitigating concerns that our results may be due to inadequate control for auditor switching.

positively associated with *IRR* and that this effect is more pronounced in stronger investor protection countries.

6. Conclusion

Using a sample drawn from firms in fourteen countries, this study examines the relation between excess auditor remuneration and the IRR on equity capital in global markets. We test whether IRR is affected by excess auditor remuneration through an information risk effect. We further investigate whether the strength of the relation between IRR and excess auditor remuneration varies systematically with the degree of investor protection in the economy.

Our evidence shows that (1) excess auditor remuneration is positively associated with IRR and (2) the positive relation between IRR and excess auditor remuneration is stronger in countries that have stronger investor protection environments. These results are robust to the inclusion of an extensive set of control variables and to several sensitivity analyses.

We advance the literature in two important aspects. First, our evidence shows that investors demand higher rates of return for firms with abnormally high auditor remuneration, consistent with the general investor view that excess auditor remuneration represents economic bonding between the auditor and the client. Such bonding leads to a less independent audit, which reduces the role of the audit in minimizing information risk. Second, we show that this effect varies with the degree of investor protection in a country. The findings are consistent with the arguments in Ball (2001), Bushman and Smith (2001), Francis, Khurana, and Pereira (2003), and Francis et al. (2006) that auditing plays a reduced role in environments that lack the "enabling" country-level institutions. In other words, it is primarily in environments in which those country-level institutions are stronger that investors tend to rely more on an audit to assess the quality of financial statement information. Thus, the negative effect of bonding between the auditor and the client firm is perceived as relatively more detrimental in stronger investor protection countries.

Although we subject our findings to a battery of robustness tests, our findings should be interpreted cautiously. First, as is common in this line of research, it is difficult to prove causality. That is, we establish a strong case for a positive association between excess auditor remunerarion and the ex ante cost of equity capital (controlling for potential simultaneity between the two as well as controlling for last year's fees), but our tests cannot prove that increases in (excess) auditor remuneration cause an increase in IRR. Second, although our choice of investor protection variable has been used in prior research, it could proxy for some unknown country factor. However, we report results using alternative proxies for investor protection, and we control for country-level disclosure scores. Third, although we subject our measure of *IRR* to a number of sensitivity analyses, it could still be measured with error. Finally, our sample size is constrained by the availability of auditor remuneration. Thus, we cannot claim that our results would necessarily generalize to a broader set of firms.

APPENDIX A

Measurement of the Implied Required Rate of Return

The Residual Income Valuation Model

Following Frankel and Lee (1998), Lee, Myers, and Swaminathan (1999), Liu, Nissim, and Thomas (2002), and Ali, Hwang, and Trombley (2003), our first residual income valuation (*RIV*) model (*RIVC*) assumes that the residual income is constant beyond year $t + 2$. We denote earnings per share by eps_t and book value of equity per share by bv_t and represent price per share in period t as follows:

$$P_t = bv_t + \sum_{s=1}^{2}\left(\frac{E_t(eps_{t+s} - r_t \times bv_{t+s-1})}{(1+r_t)^s}\right) + \frac{E_t(eps_{t+2} - r_t \times bv_{t+1})}{r_t \times (1+r_t)^2} \qquad (3)$$

Our second *RIV* model (*RIVI*) assumes that the return on equity (ROE) trends linearly to the industry median ROE by the twelfth year and that thereafter the residual incomes remain constant in perpetuity (e.g., Gebhardt, Lee, and Swaminathan [2001]). In the *RIVI* model, the current price per share is as follows:

$$P_t = bv_t + \sum_{s=1}^{2}\left(\frac{E_t(eps_{t+s} - r_t \times bv_{t+s-1})}{(1+r_t)^s}\right) + \sum_{s=3}^{11}\frac{[E_t(ROE_{t+s} - r_t)] \times bv_{t+s-1}}{(1+r_t)^s}$$
$$+ \frac{[E_t(ROE_{t+12} - r_t)] \times bv_{t+11}}{r_t \times (1+r_t)^{11}} \qquad (4)$$

We make the same assumptions about the dividend payout ratio for all models as follows. We use analysts' forecasts of dividends when available. Otherwise, we estimate the future dividend payout ratio by scaling dividends in the most recent year by earnings over the same year (or by analysts' one-year-ahead earnings forecasts for firms with negative earnings). We compute future book values of equity using the dividend forecasts (if not available, dividend payout ratio) and analysts' earnings forecasts based on the clean surplus relation.

Under these assumptions, we solve for r_t by searching over the range of 0 to 100 percent for a value of r_t that minimizes the difference between the stock prices and the intrinsic value estimates.

The Ohlson and Juettner-Nauroth Model

For the Ohlson and Juettner-Nauroth (*OJ*) model, we set the perpetual growth rate of the capitalized abnormal earnings growth ($\gamma - 1$) to be equal to the country-specific risk-free interest rate minus the country-specific long-term inflation rate, or set equal to zero if negative (e.g., Claus and Thomas [2001]). Let dps_{t+1} be the dividends during future period $t + 1$ and denote abnormal earnings growth by $aeg_{t+2} \equiv eps_{t+2} + r_t\, dps_{t+1} - (1 + r_t)eps_{t+1}$. The current price per share is then as follows:

$$P_t = \frac{eps_{t+1}}{r_t} + \frac{aeg_{t+2}}{r_t(r_t - \gamma + 1)}. \qquad (5)$$

Consequently the formula for the *IRR* is as follows:

$$r_t = A + \sqrt{A^2 + \frac{eps_{t+1}}{P_t}\left(\frac{(eps_{t+2} - eps_{t+1})}{eps_{t+1}} - (\gamma - 1)\right)} \tag{6}$$

where $A \equiv \frac{1}{2}\left(\gamma - 1 + \frac{dps_{t+1}}{P_t}\right)$. When $eps_{t+1} > eps_{t+2}$, we set the short-term earnings growth $(eps_{t+2} - eps_{t+2})$ to zero. When the value inside the root is negative, we assume that the *IRR* is A.

The PEG Model (a special case of the OJ model)

If we assume that both $\gamma = 1$ and dps_{t+1} in the *OJ* model, we can obtain the *PEG* model as follows (e.g., Easton [2004]): $P_t = \frac{eps_{t+2} - eps_{t+1}}{r_t^2}$. When $eps_{t+1} > eps_{t+2}$, the *IRR* is set as the *IRR* derived from the *OJ* model.

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