Earnings Quality, Corporate Governance, and Earnings Quality

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Abstract: There are two seemingly contradictive perspectives in the literature on corporate governance and earnings quality. We find that poor innate earnings quality is associated with better governance structures, consistent with firms building governance mechanisms in response to earnings quality features inherent to their business models and operating environments. We find that better discretionary earnings quality is associated with better governance, consistent with managers responding to governance structures when making reporting decisions. Both perspectives can thus be accommodated within a single framework, provided a valid separation of the innate and discretionary portions of earnings quality. Such a separation also allows to observe how the effectiveness of governance structures varies with the level of innate earnings quality. Our analysis shows how earnings quality shapes and is shaped by corporate governance, depending on its source.

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1. Introduction

The relation between corporate governance and earnings quality is an issue that has proved elusive and often contentious among accounting researchers. Part of the reason is that the empirical literature that examines earnings quality and corporate governance has found weak and inconsistent results (Larcker, Richardson and Tuna 2007). A more fundamental reason is that, theoretically, the relation differs both in terms of expected causation and expected sign, depending on the perspective one takes on earnings quality, i.e., whether one views earnings quality as primarily innate or primarily discretionary in nature (Francis, Olsson and Schipper 2008). In the former case the firm is endowed with innate earnings quality issues, by virtue of its business model and operating characteristics, to which it builds countervailing corporate governance structures (Bushman, Chen, Engel and Smith 2004); that is, poor earnings quality is associated with better governance. In the latter case, governance structures are taken as given and deficiencies in these structures facilitate greater exercise of discretion to manage earnings where incentives to do so are present, i.e., poor governance is associated with poor earnings quality (e.g., Holthausen, Larcker and Sloan 1995, Klein 2002, Larcker and Richardson 2004, Bowen, Rajgopal and Venkatachalam 2008). This perspective implicitly assumes that earnings quality is primarily discretionary in nature. In this study, we follow the theoretical distinction alluded to above and develop an empirical framework that allows for joint tests of the two main links between earnings quality and corporate governance, based on the source of earnings quality: innate firm characteristics or managerial incentives.

Because the predictions are diametrically opposed, correctly identifying innate and discretionary components of earnings quality is a first-order research design consideration when investigating corporate governance linkages. Both practitioners and academics have long recognized that the two portions of earnings quality exist. For example, in a survey study Dichev, Graham and Rajgopal (2012) report that Chief Financial Officers estimate that about 50% of earnings quality is driven by innate factors, but that substantial discretionary earnings

management also takes place. Academic researchers commonly try to disentangle the discretionary portion of earnings quality from the innate portion by estimating the statistical association between earnings quality and firm fundamentals, and then designating the unexplained portion of earnings quality, i.e., the residual, as discretionary (e.g., Jones 1991, DeFond and Jiambalvo 1994, Dechow, Sloan and Sweeney 1995, Francis, LaFond, Olsson and Schipper 2005, Kothari, Leone and Wasley 2005).[1]

Defining a regression residual as a measure of discretionary earnings quality means that it is orthogonal to business fundamentals. This is a key research design choice, because it overlooks and also rules out the enabling and motivating roles of firm fundamentals for discretionary reporting decisions, such as earnings management. Consider, as an easy example, cash flow volatility (a firm fundamental). It *enables* earnings management such as earnings smoothing (a discretionary decision) because there is volatility to smooth in the first place, and it *motivates* earnings management, because a majority of managers believe that showing volatile earnings has adverse stock market consequences (Graham, Harvey and Rajgopal 2005). More formally, in traditional approaches to separating innate from discretionary earnings quality, any shared variation between earnings quality and fundamentals is ascribed solely to innate earnings quality, even though such shared variation is likely to also have non-trivial consequences for discretionary reporting decisions. Another issue with traditional residual-based approaches is that measurement error in earnings quality, which ends up as noise in the residuals, is mechanically ascribed to managerial discretion, thereby reducing the power of the design.

We follow the model in Athanasakou and Olsson (2012) to separate innate and discretionary components of earnings quality. The basic set-up is conceptually simple and can be described as follows. We regress an earnings quality measure on a set of variables capturing firm

[1] Some of the cited studies use accruals instead of an explicit earnings quality measure and estimate discretionary accruals, which is typically interpreted as earnings management or an inverse measure of discretionary earnings quality. When we refer to earnings quality we define the term widely to include both accruals measures and modelled earnings quality measures.

fundamentals and incentives for discretionary accounting choices. The fitted value from the fundamental variables is the measure of innate earnings quality, i.e., the portion of earnings quality associated with the firm's business model and operating environment. The fitted value from the incentive variables is the measure of discretionary earnings quality, i.e., the portion of earnings quality associated with managerial incentives. The residuals, finally, represent noise. This research design has two potential advantages over traditional models. First, it does not assume that innate and discretionary earnings quality are orthogonal to each other. Second, it filters out noise that would have been otherwise mechanically allocated to the measure of discretionary earnings quality (the residual). The potential disadvantage of the approach is misclassification risk because of the difficulty in identifying correct variables describing fundamental factors and incentive factors. Our research setting is ideally suited to mitigate this risk as the two earnings quality components are predicted to have opposite associations with corporate governance.

Our main earnings quality measure is derived as the common factor of three commonly used proxies for earnings quality: accruals quality (Dechow and Dichev 2002), absolute abnormal accruals from the modified Jones (1991) model, and earnings variability.[2] We use several variables proxying for firm fundamentals suggested by prior literature, such as sales volatility, cash flow volatility, intangibles intensity, etc. We follow Fields, Lys and Vincent (2001) in identifying three categories of incentive variables: contractual arrangements, asset pricing considerations, and influencing external parties. In short, the choice of fundamental and incentive variables is based on evidence and suggestions in extant literature. Similarly, we follow prior literature in identifying corporate governance variables, either direct governance/monitoring measures, such as board structure or high quality auditing, or inverse measures such as variables capturing managerial entrenchment.

[2] Earnings variability has been shown to work as an instrument for various earnings quality measures, such as earnings smoothness, earnings predictability, and poor matching of revenue and expenses (Francis, LaFond, Olsson and Schipper 2004; Dichev and Tang 2008, 2009).

Results are consistent with both main hypotheses. The tests of corporate governance variables on innate earnings quality consistently show significant results in the hypothesized direction. As innate earnings quality worsens, companies opt for stronger internal and external monitoring and seek to adopt corporate governance arrangements that reduce entrenchment. Regressing discretionary earnings quality on seven governance/monitoring variables yields seven coefficient estimates significant in the expected direction. Discretionary earnings quality increases with measures of internal and external monitoring, and with external audit by a *BigN* audit firm.[3] It worsens with measures of entrenchment and pressures to achieve earnings targets. In contrast, traditional discretionary earnings quality measures, such as abnormal accruals, show substantially weaker explanatory power and inconsistent associations with governance variables.

Additional tests show that there is a significant association between discretionary and innate earnings quality, consistent with firm fundamentals (which are the drivers for poor innate earnings quality) having an enabling and motivating role for discretionary earnings quality choices. Specifically, discretionary earnings quality is poor when innate earnings quality is poor. This raises the possibility that the relation between corporate governance and discretionary earnings quality is not linear, because one would expect good corporate governance mechanisms to work especially well when innate earnings quality is poor, such as in volatile business environments. This is borne out by the data. For board structure variables and *BigN* auditor monitoring, the effect of corporate governance on discretionary earnings quality is more pronounced the poorer is the innate earnings quality. Similarly, entrenchment variables' deteriorating effect on discretionary earnings quality is less pronounced the poorer is the innate earnings quality. The results of this test are thus consistent with the full set of hypotheses: poor innate earnings quality firms build more effective corporate governance mechanisms, which in turn work more effectively at improving discretionary earnings quality.

[3] The coefficient on *BigN* monitoring loses significance, however, when including certain additional control variables.

Results are generally robust to sensitivity tests, but some caveats are in order. Statistically fitted earnings quality values, such as our innate and discretionary earnings quality measures, are subject to the concern that detected earnings quality effects may be due to the underlying variables themselves rather than to their effect on earnings quality. Several robustness tests indicate that the underlying innate and incentive variables do not explain the results in our research setting; however, one should be aware of the general concern about fitted values. Another caveat is that the definition of innate versus discretionary earnings quality depends on the identification of innate factors that capture business fundamentals, and incentive variables that capture managerial incentives. We do not take a stance on the "correct" identification; rather, we attempt to include variables commonly used in prior literature. At the end of the day, however, such choices remain subjective and it rests with empirical evidence to provide construct validity. We view the corporate governance results as jointly supporting the hypotheses and the construct validity of the measures of innate and discretionary earnings quality.

In summary, the results support both perspectives in the scholarly debate about the relation between earnings quality and corporate governance. The analysis therefore shows how earnings quality shapes and is shaped by corporate governance mechanisms, depending on its source. Second, the analysis sheds light on how innate earnings quality shapes discretionary earnings quality by affecting the effectiveness of corporate governance mechanisms. Governance arrangements are increasingly effective as innate quality worsens. Third, while many studies hypothesize that strong governance leads to good discretionary earnings quality, there has been relatively weak and inconsistent empirical evidence. Larcker et al. (2007) attribute the mixed results in part to difficulties in capturing the complex construct of corporate governance, i.e., to difficulties with governance variables. Our evidence suggests that the measurement error in traditional earnings quality constructs also plays a substantial role.

The study continues as follows. Section 2 briefly discusses prior literature and develops the expectations for relations among innate and discretionary earnings quality and corporate

governance structures. Section 3 describes the research design. Section 4 describes the sample and the main results. Section 5 presents additional analyses and robustness checks. Section 6 concludes.

2. Innate and discretionary earnings quality and the role of corporate governance

An interesting aspect of the corporate governance literature is that it suggests different predictions about the association between earnings quality and governance structures (e.g., external and internal monitoring, ownership structure, executive compensation contracts) when researchers consider earnings quality as entirely or mostly intrinsic, compared to when earnings quality is seen as entirely or mostly discretionary. For example, Bushman, Chen, Engel and Smith (2004) assume that earnings quality proxies for *inherent* limitations of accounting measures to capture timely and value relevant information; accordingly, they investigate whether firms with poor quality measures have built countervailing governance structures, such as increased external monitoring. This line of reasoning suggests that corporate governance structures respond to quality and that poor (innate) quality is associated with good governance. In contrast, other studies take governance structures as given and investigate whether deficiencies in these structures facilitate greater exercise of discretion to manage earnings, or poorer earnings quality (e.g., Holthausen, Larcker and Sloan 1995, Klein 2002, Larcker and Richardson 2004, Bowen, Rajgopal and Venkatachalam 2008). This line of research suggests that quality responds to governance structures, i.e., that poor (discretionary) quality is associated with poor governance.

When earnings quality is viewed as innate, as in Bushman et al., the empirical results are consistent with the view that firms with poor earnings quality choose greater external monitoring and more concentrated ownership structures to compensate for the poor quality of accounting information. When earnings quality is assumed to be primarily discretionary, however, the literature has not produced a consistent set of results regarding the linkages with earnings quality. Larcker, Richardson and Tuna (2007) argue that the mixed results are attributable to the difficulty

in generating reliable measures for the complex construct of corporate governance. They find that corporate governance indices relating to board characteristics, stock ownership, institutional ownership, compensation incentives and anti-takeover provisions exhibit a mixed association with abnormal accruals and little or no association with earnings restatements. An alternative explanation for the mixed results in this stream of literature, however, can be errors in earnings quality measures, or the varying extent of innate and discretionary earnings quality within these proxies, as these perspectives have opposite expected associations with governance structures.

In addition to the separate (and opposite) predictions for innate and discretionary earnings quality associations with corporate governance, we expect there to be non-trivial interaction effects. This prediction stems from two reasons. First, as mentioned in the introduction, innate features of the firms' economic environment, e.g. revenue and cash flow volatility or operating losses, may both enable earnings management and create incentives for it. Consequently, absent any corporate governance effects, we expect discretionary earnings quality to be poor (for example, because of earnings management) when innate quality is poor. Because we expect firms to invest in better functioning corporate governance mechanisms when innate quality is poor, we expect the effect of corporate governance on discretionary quality to be more pronounced when innate quality is poor. In the limit, corporate governance could even cancel out the incentives induced by a volatile business environment; however, we believe that to be unlikely as a practical matter.

In summary, we expect (i) corporate governance to be decreasing in innate earnings quality, (ii) discretionary earnings quality to be increasing in corporate governance, and (iii) the effectiveness of governance mechanisms to be increasing in innate earnings quality.

3. Research design

In this section we first define the empirical earnings quality measures, next we describe how we obtain the innate and discretionary components of earnings quality and, finally, we

present the models for testing how earnings quality shapes and is shaped by corporate governance structures.

3.1 Measuring earnings quality

Prior literature uses various metrics for earnings quality, some based on earnings attributes and others on accruals properties. As there is no agreed-upon measure of earnings quality, we use four different measures: a) accruals quality (*AQ*); b) absolute abnormal accruals (*AbsAA*); c) earnings variability (*EarnVar*); and a combined measure based on the common factor score for these metrics (*EQ*). The latter is our main measure of earnings quality. Exact definitions for all variables are listed in Appendix A. Accruals quality, *AQ*, is based on the Dechow and Dichev (2002) model, as extended by McNichols (2002), which measures the extent to which working capital accruals map into cash flows in the current, prior, and future periods and changes in revenues and property, plant and equipment. We estimate the absolute value of abnormal accruals, *AbsAA*, based on the modified Jones (1991) model. The standard deviation of earnings, *EarnVar*, has been shown to work as an instrument for various earnings quality measures, such as earnings smoothness, earnings predictability, accruals quality, poor matching of revenue and expenses, etc. (e.g., Francis, LaFond Olsson and Schipper 2004, Dichev and Tang 2008, 2009). We define earnings as earnings before extraordinary items, scaled by total assets. Higher values of *AQ*, *AbsAA,* and *EarnVar* indicate poorer earnings quality.[4] Our fourth earnings quality measure is the common factor score obtained from a factor analysis of *AQ*, *AbsAA*, and *EarnVar*. The common factor, *EQ*, has the same ordering as the underlying variables, so larger values of *EQ* indicate poorer earnings quality. Since each earnings quality measure captures different properties of the financial reporting outcome and reflects various managerial incentives (Dechow, Ge and Schrand 2010), the common factor is potentially a more comprehensive measure of earnings quality.

[4] We use the terms "poor" and "good" earnings quality merely to remain consistent with prior literature, but we do not mean to imply a judgement. The reason we do not use 'high' and 'low' earnings quality is that the ordering of earnings quality variables vary across studies.

3.2 Innate and discretionary earnings quality

We follow Athanasakou and Olsson (2012) to extract measures of innate and discretionary earnings quality. We regress our earnings quality measure on a set of variables capturing firm fundamentals and managerial incentives for accounting choices. The set of firm fundamentals includes the seven *innate* variables identified in Dechow and Dichev (2002) and Francis, LaFond, Olsson and Schipper (2004, 2005): *firm size, cash flow variability, sales variability, length of operating cycle, incidence of negative earnings realizations, intangibles intensity,* and *capital intensity*. The set of managerial incentives sort into three categories based on the theoretical foundations of accounting choice and the taxonomy in Fields, Lys and Vincent (2001): contractual arrangements, asset pricing considerations, and influencing external parties. Athanasakou and Olsson (2012) operationalize these incentives using fourteen variables: *incentives pay*, *proximity to financial default* (using the Merton 1974 distance to default model), *equity offerings, shares for share acquisitions, debt issues, meeting analyst forecasts, reporting earnings increases, reporting profits, firm listing age, growth, negative stock returns, tax considerations, competition,* and *public visibility*.

We next regress the earnings quality measures on the innate and incentive variables. The fitted value from the fundamental variables becomes the measure of innate earnings quality (*InnateEQ*), i.e., the portion of earnings quality associated with the firm's business model and operating environment. The fitted value from the incentive variables is the measure of discretionary earnings quality (*DiscEQ*), i.e., the portion of earnings quality associated with managerial incentives. Appendix B summarizes the detailed form of the model, provides definition of variables, and shows how the earnings quality measure loads on firm fundamentals and managerial incentives.

3.3 Innate earnings quality and corporate governance

A firm can have poor innate earnings quality as a consequence of its business model and operating environment, or its "fundamentals" for short. Following the notion in Bushman, Chen

Engel and Smith (2004), we expect the firm to build countervailing corporate governance structures. We follow the framework in Bushman et al. and regress corporate governance characteristics on innate earnings quality and other economic corporate governance determinants using the following model.

$$CGI_{i,t} = a_0 + a_1 InnateEQ_{i,t} + a_2 Size_{i,t} + a_3 BM_{i,t} + a_4 YrsListed_{i,t} + a_5 ROE_{i,t} + a_6 Financials_{i,t} + a_7 Utilities_{i,t} + \sum_{m=8}^{13} a_m OtherCGI_{m;i,t} + a_{14} BigN_{i,t} + e_{i,t} \quad (1)$$

where *CGI* represents one of six corporate governance indicators: a) a composite variable for the company's board structure (*BoardStr*), b) the number of outside directors in the company's board (*#OutDir*); c) a composite variable for shareholder concentration (*ShldConc*), d) a composite variable for managers' equity based incentives (*ExecEqInc*); e) managerial stock ownership (*Stk%Dir*).

The composite variable for the company's board structure contains the size of the board (*BoardSize(#DIR)*), the existence of interlocking directorates (*Interlocking*), outside director expertise (*#OthBoard*) and the number of outside directors (*#OutDir*). We consider firms with larger boards and more outside directors to have more independent boards, and firms with more interlocking directorates and more director expertise to have more knowledgeable boards. As a result, we expect *BoardStr* to be increasing in poor innate earnings quality (given the ordering of *InnateEQ* this translates into a positive association between *BoardStr* and *InnateEQ*).[5] To separately identify the choice of stronger internal monitoring in response to the moral hazard issues arising within firms with poor innate earnings quality, we also examine the number of *outside directors* (*#OutDir*) as a separate corporate governance indicator.

[5] Evidence that greater independence improves governance and firm performance is presented in Byrd and Hickman (1992), who show that firms with outsider-controlled boards make better acquisitions, Weisbach (1988), who show that outsider-controlled boards are more likely to replace poorly performing CEOs, Klein (2002), Xie, Davidson and DaDalt (2003), and Peasnell, Pope and Young (2005), who show that firms with more independent boards have smaller income-increasing discretionary accruals, and Beasley (1996) and Dechow, Sloan and Sweeney (1996), who show that outside-controlled boards are associated with a lower incidence of fraud.

The composite variable for shareholder concentration contains the percentage of stock held by outside investors (*%Out*), institutions (*%Inst*), and institutions owning more than 5% of the firms' shares (*%BlockInst*). We predict that firms with poor innate earnings quality will favor ownership structures with stronger external monitoring, i.e. higher shareholders' concentration (consequently, the way the variables are ordered we expect a positive association between *ShldConc* and *InnateEQ*).

The composite variable for equity-based incentives (*ExecEqInc*) captures the structure of the directors' incentives packages, including the percentage of the value of all incentive plans represented by equity-based plans (options, restricted shares – *EqincTot*) and by long-term plans (e.g. options, restricted shares and long-term performance plans – *LTincTot*). We predict that firms with poor innate earnings quality will have executive compensation packages that include a higher proportion of equity-based pay to better align incentives, i.e., a positive association between *ExecEqInc* and *InnateEQ*.

Bushman et al. predict that firms with limited quality accounting information will opt for higher managerial ownership to better align the interests of managers with shareholders. However, the literature examining the effect of ownership structures on firm value and accounting choices also highlights the role of entrenchment. As managerial ownership increases, managers may become entrenched and pursue private benefits at the expense of outside investors (e.g., Demsetz and Lehn 1985, Morck, Shleifer and Vishny 1988, Stulz 1988).[6] The risk and costs of entrenchment are likely to be particularly high in inherently poor information environments as the managers will be better able to extract firm value to the detriment of other shareholders in these environments. We therefore predict that as innate earnings quality deteriorates, companies would opt for lower managerial ownership to mitigate the risk and costs

[6] Entrenchment costs relate to managers making sub-optimal operating and financing decisions (e.g., blocking value-enhancing projects and takeovers). On higher levels of managerial ownership the negative effect on firm value associated with entrenchment could exceed the incentive benefits of managerial ownership.

of entrenchment, i.e., a negative association between managerial ownership (*Stk%Dir*) and *InnateEQ*.[7]

We include a number of control variables. Following Bushman et al., we include the market value of equity (*Size*), the market to book ratio (*BM*), the number of years a firm has been public (*YrsListed*), return on equity (*ROE*), and indicators of firms operating in the highly regulated financial (*Financials*) and utilities (*Utilities*) sector. In exploring the interactions between board committees and executive compensation packages, Laux and Laux (2009) also propose that these corporate governance structures act as substitute oversight mechanisms. To account for the potential substitutability (or complementarity) between corporate governance mechanisms, we include all remaining corporate governance indicators for each indicator examined, although we do not take an a priori stance on whether all governance mechanisms are substitutes or whether some work as complements. We also include the effect of high quality external auditing (*BigN*).

3.4 Discretionary quality and corporate governance

While managers are largely unable to influence innate earnings quality (absent changes to the business model itself), they can make financial reporting choices that affect discretionary earnings quality. As argued by prior research investigating governance structures and discretionary earnings quality, such managerial actions respond, in part, to the ownership structure, board monitoring and other corporate governance mechanisms. To test whether these mechanisms are able to restrain poor discretionary earnings quality, we model *DiscEQ* on corporate governance characteristics using the following model.

$$\begin{aligned} DiscEQ_{i,t} = {} & a_0 + a_1 BoardSize(\#DIR)_{i,t} + a_2 \#OutDir_{i,t} + a_3 Interlocking_{i,t} + a_4 \#OthBoard_{i,t} \\ & + a_5 \%Inst_{i,t} + a_6 Stk\%Dir_{i,t} + a_7 BigN_{i,t} + e_{i,t} \end{aligned} \quad (2)$$

[7] Because the entrenchment role of managerial ownership is not undisputed, we also investigate this issue using alternative entrenchment variables.

Prior studies conclude that managers of firms with less independent and less efficient boards are more likely to engage in earnings management, as evidenced by more income-increasing abnormal accruals or larger unsigned abnormal accruals (e.g., Beasley 1996, Dechow, Sloand and Sweeney 1996, Klein 2002, Xie, Davidson and DaDalt 2003, Peasnell, Pope and Young 2005, Larcker, Richardson and Tuna 2007). Hence, we expect that firms with less independent and efficient boards have poorer discretionary earnings quality. As we consider firms with larger boards, more outside directors, more interlocked directorates and more directors' expertise to have more independent and efficient boards of directors, we expect an inverse association between *DiscEQ* and the four board structure variables, *BoardSize(#DIR), #OutDir*, *Interlocking*, and *#OthBoard*.

In terms of institutional monitoring, Larcker, Richardson and Tuna (2007) find that the percentage of the firm's shares held by institutions is inversely related to the absolute value of abnormal accruals, consistent with institutional monitoring reducing incentives and opportunities for earnings management. In contrast, Matsumoto (2002) and Ashbaugh, LaFond and Mayhew (2003) find the opposite. They argue that institutional investors overemphasize short-term profits creating strong incentives for earnings management to meet earnings targets. Consistent with their hypothesis, they find that firms with a higher percentage of shares held by institutions are more likely to meet earnings targets and have more, not less, income-increasing discretionary accruals. If institutional owners indeed put greater pressure on managers to meet earnings targets, we expect a positive association between institutional ownership, *%Inst* and *DiscEQ*, as our measure of discretionary earnings quality is a function of the earnings targets that managers seek to achieve. While we thus expect a positive association, we note the uncertainty in prior literature about this variable.[8]

[8] The uncertainty and inconsistent results in the literature about the role of institutions is also evident in the different expectations in the innate quality analysis vs. the discretionary quality analysis in this study. Based on Bushman et al., we expect institutions to be drawn to firms with more volatile business models and therefore poorer innate (long-term) earnings quality, because institutions can have an advantage in

In terms of managerial stock ownership, we view this as an entrenchment variable. Cheng and Warfield (2005) provide direct evidence that equity incentives lead to earnings management, finding that managers' equity ownership increases the likelihood of meeting earnings targets and that insider sales follow reporting of income increasing abnormal accruals. Similarly, Klein (2002) also reports a positive association between CEO shares ownership and absolute abnormal accruals. Accordingly we expect a negative association between managerial ownership and earnings quality. Given the ordering of *DiscEQ,* this translates to a positive association between *Stk%Dir* and *DiscEQ*. Here again, however, results in the literature are not consistent. For example, Warfield, Wild and Wild (1995) find that managerial ownership is beneficial for earnings quality at lower levels of managerial ownership. Based on such findings, we provide additional analyses separating lower from higher levels of managerial ownership.

Prior literature suggests that firms with more/better external monitoring by auditors are less likely to engage in earnings management and thus have better earnings quality (e.g., Becker, DeFond, Jiambalvo and Subramanyan 1998, Francis, Maydew and Sparks 1999, Johnson, Khurana, and Reynolds 2002, Myers, Myers and Omer 2003). As a proxy of audit quality we use an indicator of the largest audit firms, *BigN* (eight, or fewer in later years). Given the ordering of the variables, we expect a negative association between *BigN* and *DiscEQ*.

In summary, we attempt to largely follow prior literature in forming expectations about linkages between innate earnings quality and corporate governance and between corporate governance and discretionary earnings quality. In more than one instance, however, prior literature does not paint a consistent picture, and reasonable arguments can be made for effects in different directions. Where possible, we provide additional analyses in such cases.

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monitoring because of their expertise and size. That said, as mentioned above, institutions can also have preferences for firms' meeting short-term earnings targets, meaning that institutions can create incentives for earnings management, i.e., poor (short-term) discretionary earnings quality. We recognize this long-term vs. short-term inconsistency in our expectations, but believe that it is largely consistent with prior literature (although some results in prior literature are mixed).

4. Sample and results

4.1 Sample

To compute the earnings quality measures we obtain accounting data from Compustat, stock market data from CRSP, executive compensation data from ExecuComp, analyst forecast data from I/B/E/S, corporate governance data from Risk Metrics and ownership data from Thomson Reuters. Since *AQ* requires five annual residuals of a model that includes both lead and lag cash flows, and we also need time series of accounting data for firm-specific volatility variables, we restrict the sample to firms with at least seven years of data. This yields 30,738 observations over fiscal years 1992-2007. Executive compensation data are available for the firms in the S&P 1500 Index (active, inactive, current and previous members) from 1992 and onwards. Requiring ExecuComp data and analyst forecast data from I/B/E/S and deleting outliers before estimating the earnings quality equation restricts the sample to 11,829 observations over the fiscal years 1992-2007.[9] Requiring further corporate governance and ownership yields a final sample of 5,504 observations for 985 distinct firms over the fiscal years 1992-2007.

Panel A of Table 1 contains descriptive statistics for the earnings quality measures. These are estimated on the maximum sample available (i.e., 11,829 observations, before requiring corporate governance data). Generally, the mean and median earnings quality measures are somewhat lower (indicating slightly better earnings quality) compared to studies that use less restrictive samples. For example, our mean [median] *AQ*, 0.036 [0.030] is somewhat lower than Francis, LaFond, Olsson and Schipper (2005), who report 0.044 [0.031] for their sample of firms, which is unconstrained by requirements about analyst following and ExecuComp coverage. The comparison is consistent with our firms being larger and more stable because of sample requirements (with correspondingly better earnings quality). Indeed, the mean (median) size, defined as log of total assets, in our sample is 7.623, (7.488); Francis et al. report 4.805 (4.625).

[9] We delete observations with studentized residuals bigger than three in the main earnings quality regression (Equation a in Appendix B). Results are not sensitive to this outlier control.

All earnings quality metrics in our sample exhibit a substantial standard deviation compared to the mean, however, indicating that meaningful cross-sectional variation exists.[10]

In terms of corporate governance variables, our sample includes a broader panel of firms compared to Bushman, Chen, Engel and Smith (2004), who study Fortune 1000 firms in 1994. For example, the mean size of the board for the firms in our sample is six directors, 67% of which are outside directors. Bushman et al. report an average of 11 directors for their sample firms and a fraction of 78% outside directors. The average director in our sample is a member of at least one other board and incentive pay represents approximately 37% of the compensation package. For our sample firms, a substantial percentage of stock, 67% on average, is held by institutional investors, while an average of 3% stock is held by inside directors. In the Bushman et al. sample, the average director is a member of two other boards and receives half of the compensation package in incentives pay, and firms have somewhat lower average institutional and insider ownership (53% and 2% respectively). All governance variables in our sample display substantial cross sectional variation, with the exception of board interlock, which is zero even in the 75th percentile.

Panel B of Table 1 shows the correlation between the four earnings quality measures. *EQ*, the common factor of *AQ*, σ*EARN*, and *AbsAA*, is highly correlated with all three (49% or higher in both Pearson and Spearman correlation), indicating that all three measures contribute meaningfully to the common factor. Panel C shows the Pearson/Spearman correlations among *InnateEQ*, *DiscEQ*, corporate governance variables and controls. The first thing to note is the substantial positive correlation between *InnateEQ* and *DiscEQ* (0.471/0.501). This is due to the association between firm fundamentals and discretionary earnings quality (innate factors explain 38% of the variation in *DiscEQ*, see Appendix B). The correlation notwithstanding, the two

[10] Other studies with data-imposed sample restrictions show descriptive *EQ* statistics that are similar to ours or better on average. For example, Dechow and Dichev (2002), who restrict their sample to manufacturing firms 1987-1999 and have time-series requirements similar to ours, report an average *AQ* of 0.028 (we report 0.036) with a standard deviation of 0.025 (we also report 0.025).

earnings quality components are substantially non-overlapping (the correlation implies that variation in *InnateEQ* explains about 25% of the variation in *DiscEQ*). Consequently, there is scope for *InnateEQ* and *DiscEQ* to have differential properties in the corporate governance tests.

With respect to remaining variables, *InnateEQ* is positively correlated with shareholder concentration, yet negatively correlated with board structure (*BoardStr*) and equity-based incentives (*ExecEqInc).* These negative univariate associations are largely due to firm size, because *InnateEQ* loads negatively on size, and in the literature there is a long established positive association between size and corporate governance structures. Once we control for the size (Table 3, Panel A), *InnateEQ* exhibits the predicted associations with all corporate governance structures. *DiscEQ* is negatively correlated with *BoardStr* and all the board structure composite variables and outsider stock ownership. It is positively correlated with institutional ownership and insider ownership. These associations are maintained in the multivariate tests, and we discuss them there (Section 4.3).

4.2 Innate earnings quality and corporate governance

Table 3 reports the regression results of corporate governance structures on innate earnings quality (Equation 1). Panel A contains results of a parsimonious specification where the only control variable is firm size, which uniformly in the literature has been shown to be associated with corporate governance as well as earnings quality. Panel B contains the results of Equation (1) including all control variables. Results with respect to the relation between innate earnings quality and corporate governance are similar in both panels, and we focus on the Panel B results in this discussion. Consistent with predictions we find that *InnateEQ* is positively associated with *BoardStr*, *#OutDir*, *ShldConc,* and *ExecEqInc* (t-statistics range from 1.71 to 4.13, depending on governance measure). Also consistent with predictions, we find that *InnateEQ* is inversely related to stock ownership (*Stk%Dir*) (t-statistic −1.99). Other than innate earnings quality a number of control variables are significantly related to the corporate governance mechanisms, such as size, growth opportunities, firm age, banks and utilities firms.

We note the significant negative associations between *BoardStr*, *Stk%Dir,* and *ExecEqInc*, consistent with board structure, managerial ownership and executive compensation acting as substitute oversight governance devices (as suggested by Laux and Laux 2009). The associations between *BoardStr, ShldConc* and *BigN* are positive, suggesting that the structure of boards, outside ownership and external auditors act as complementary governance mechanisms.

We perform additional untabulated sensitivity tests. First, we include the measure of discretionary earnings quality, *DiscEQ*, as an additional control variable (recall that there is a non-trivial correlation between *InnateEQ* and *DiscEQ*), which has no effect on the results. Second, we replace *InnateEQ* with the other innate earnings quality measures (innate accruals quality, innate earnings variability and innate absolute abnormal accruals). Results are consistent across earnings quality measures. Third, because the interpretation of managerial ownership (*Stk%Dir*) as a measure of entrenchment is not uniform in prior literature, we replace it with the Bebchuk, Cohen and Ferrell (2009) entrenchment index, which scores firms on six provisions that are potentially beneficial to managers and harmful to shareholders: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments. We find a significant negative association between *EIndex* and *InnateEQ* (t-statistic −4.46), thus confirming the *Stk%Dir* results.[11]

In summary, the results in Table 3 suggest that firms with poor innate earnings quality opt for stronger internal and external monitoring and higher equity and long-term incentives in executive compensation. As innate earnings quality decreases firms also mitigate the potential costs of entrenchment by restraining managerial ownership. This evidence corroborates and adds to the findings of Bushman, Chen, Engel and Smith. (2004) and reinforces the argument that corporate governance structures respond to innate earnings quality. We also view the evidence as validating the empirical measure of innate earnings quality.

[11] The downside to using the Bebchuck et al. (2009) entrenchment index is substantial sample loss. Our sample is reduced by half, to 2,466 observations. The index can be downloaded from http://www.law.harvard.edu/faculty/bebchuk/data.shtml.

4.3 Discretionary quality and corporate governance

Table 4 reports the regression results of discretionary earnings quality on corporate governance structures (Equation 2). In the first column of Panel A, we report the results based on our estimate of discretionary earnings quality, *DiscEQ*. The coefficients on all seven corporate governance variables are significant in the predicted directions (t-statistics range from 2.09 to 6.19 in absolute value). Discretionary earnings quality improves with board size, interlocked directorates, the number of outside directors, outside directors' expertise and high quality external auditing, and decreases with institutional ownership and managerial ownership.[12] The R^2 is 0.0709. These results are stronger than corresponding results in much extant research on the association between corporate governance and (discretionary) earnings quality. For example, Klein (2002), Xie, Davidson and DaDalt (2003) and Larcker, Richardson and Tuna (2007) find mixed evidence of an association between governance indices and abnormal accruals (the most common measure of discretionary earnings quality), as many governance factors examined are insignificant or even significant in the wrong direction.

At this stage however, it is not clear whether the difference in results compared to prior literature is due to using a more recent sample, a different set of governance factors, or – as we argue – different measures of earnings quality. To explore the extent to which the difference in results is due to different measures of earnings quality, we repeat our tests with measures of earnings quality used in prior research. The first measure is signed abnormal current accruals

[12] Some prior research suggests that the association between managerial ownership and reporting quality may be different at lower levels of managerial ownership, and that entrenchment is more likely at higher levels (e.g., Warfield, Wild and Wild 1995). This research implies a managerial preference for better earnings quality at lower levels of managerial ownership. To investigate this issue, we repeat the analysis using a piecewise linear regression distinguishing the effect of managerial ownership at the lower quartile, the intermediate quartiles and the upper quartile of the distribution of *Stk%Dir*. The results (not tabulated) show a negative association between *DiscEQ* and *Stk%Dir* at lower ranges of ownership (*Stk%Dir:* −9.361, $t = -6.24$), a positive association for intermediate levels (*Stk%Dir:* 0.411, $t = 2.65$) and a less pronounced positive association for higher levels of ownership (*Stk%Dir:* 0.026, $t = 1.65$). These results suggest that the incentive-alignment effect of managerial ownership dominates at lower levels of ownership, while equity/entrenchment incentives prevail at intermediate and higher levels of managerial ownership. Significance for all other variables remains unchanged.

based on the modified Jones (1991) model (*AA*), as in Xie, Davidson and DaDalt (2003) and Larcker, Richardson and Tuna et al. (2007). The second column reports the regression results. In this model only *BoardSize(#DIR)* is significant in the predicted direction. The rest of the governance indices are either insignificant or significant in the wrong direction, and the adjusted R^2 of the model is low, 0.20%, compared to 7.09% for our measure.

The second measure is absolute abnormal current accruals, *AbsAA* (e.g., Klein 2002, Larcker, Richardson and Tuna 2007). In this model three of the seven variables, *Interlocking, #OthBoard,* and *#OutDir*, are significant in the expected direction, *BoardSize(#DIR)* is significant in the wrong direction, and the explanatory power remains low (0.0091). Using absolute performance adjusted abnormal accruals (*AbsPAAA)* helps, as one more variable is significant, although the explanatory power remains low (0.0098), and three of the governance variables are insignificant or significant in the wrong direction. The last column contains the results when using *ResDEQ*, which is the discretionary earnings quality measure in Francis, LaFond, Olsson and Schipper 2005 (specifically, it is the residual from a regression of *EQ* on the set of innate factors). Like the Jones model measures of earnings quality, this measure includes measurement error in the dependent variable and it is orthogonal to business fundamentals. Also in the case of *ResDEQ* the explanatory power is low (0.0066), and most variables are either insignificant or significant in the wrong direction.

Taken together, the results in Panel A of Table 4 show that our measure of discretionary earnings quality show the expected associations with various corporate governance variables with non-trivial explanatory power. Traditional residual-based measures of discretionary earnings quality, on the other hand, have very weak explanatory power and provide only mixed evidence on the relation between corporate governance and discretionary earnings quality.

Panel B of Table 4 contains sensitivity tests. Recall that *DiscEQ* is not independent of firm fundamentals (see Appendix B). Thus, it may be important to control for the earnings quality effects of business fundamentals, i.e., to control for *InnateEQ*. The first column of Panel

B introduces the common factor score of the seven innate factors, *CF*(*Innate_Factors*), as a control variable, while in the next column we add *InnateEQ* as a control. In both cases the explanatory power increases substantially (R^2=0.3451 and 0.2860 respectively), and two of the seven variables lose in significance although they retain the expected sign (*Interlocking* [t-statistic −1.52] and *BigN* [t-statistic −1.07]). We also repeat the sensitivity analysis using *AbsPAAA* (which was the best performing of the traditional measures of discretionary earnings quality in Panel A). The third column in Panel B shows the results usigng *CF*(*Innate_Factors*) as a control for firm fundamentals. In this specification only *#OutDir* remains significant in the predicted direction. When introducing the innate component of *AbsPAAA (InnateAbsPAAA)* as a control for the earnings quality effects firm fundamentals in the fourth column, none of the variables are significant in the expected direction.

Taken together, the results in Panel B of Table 4 show that our measure of discretionary earnings quality retains most of the expected associations with various corporate governance variables even when controlling for the variation in earnings quality driven by firm fundamentals. An implication of this result is that strong corporate governance structures restrain managerial discretion, also when not induced or enabled by firm fundamentals. *AbsPAAA* on the other hand, the best performing out of the traditional measures of earnings quality in Panel A, no longer vary with governance structures once we control for its innate component.

As argued in Section 2, we expect the effectiveness of corporate governance mechanisms with respect to discretionary earnings quality to be greater the poorer is the innate earnings quality. Table 5 contains the results of this analysis. We construct a quintile ranked variable, *InnateEQ*(*Q*), which is ordered such that the lowest quintile has the best innate earnings quality. The first column of Table 5 essentially repeats the second column of Table 4, Panel B, except that for brevity we use the composite board structure variable *BoardStr* instead of its four components, and we use the quintile ranked innate quality variable *InnateEQ*(*Q*) instead of the raw variable. Results are consistent with Panel B of Table 4 in that all variables are significant in

the expected direction with the exception of *BigN*, which remains insignificant. The second column adds the interaction between *InnateEQ*(*Q*) and each governance variable. In all cases corporate governance seems significantly more effective the poorer is the innate earnings quality. Specifically, as innate quality deteriorates good board structure is increasingly more important for discretionary earnings quality, as is *BigN* monitoring. The deteriorating discretionary earnings quality effect of managerial ownership and institutional ownership is also significantly lessened as innate quality worsens. Overall, Table 5 provides confirmatory evidence that the effectiveness of governance mechanisms to improve reporting quality is more pronounced in more volatile business environments with poorer innate earnings quality.

In summary, the results in Tables 4 and 5 suggest that firms make corporate governance arrangements to constrain reporting choices that lead to poor earnings quality, and that these governance arrangements are increasingly effective as innate quality worsens. Discretionary earnings quality increases with board size, interlocked directorates, the number of outside directors, outside directors' expertise, managerial ownership at intermediate levels of ownership and external audit by a *BigN* audit firm. These associations, with the exception of *BigN* monitoring, are sustained when controlling for innate earnings quality and the links between corporate governance and managerial incentives. Our analysis across different measures of earnings quality supports the argument that the weak and mixed evidence of an association between corporate governance and discretionary earnings quality in prior research is due, at least in part, to measurement error in the proxies and the varying extent of innate and discretionary earnings quality within these proxies.

5. Additional analyses

Our measure of discretionary earnings quality is statistically fitted on incentive variables and thus contains information about both earnings quality and incentives. This raises a potential concern about whether the corporate governance associations with *DiscEQ* are due, not to

earnings quality associated with incentives, but to the incentives themselves. In other words, is it possible that *DiscEQ* is simply a summary variable for incentives? While economic arguments linking corporate governance to incentives are, we believe, less direct than the links to discretionary earnings quality, governance-incentives links can certainly not be ruled out on theoretical grounds.

To investigate this issue empirically, we first form a 'pure' summary variable for incentives by forming a common factor of all incentive variables, *CF*(*Incentives*). We then regress *CF*(*Incentives*) on *DiscEQ*, and note that the explanatory power is 16.13% (not tabulated). That is, *DiscEQ* appears far from a summary variable for incentives since 83.87% of the variation in *CF*(*Incentives*) is unrelated to *DiscEQ*. Next, we test the links between corporate governance and *CF*(*Incentives*). The first column in Panel A of Table 6 repeats the regression results of equation (2) for *DiscEQ* for ease of read. The second column reports the results when we use *CF*(*Incentives*) as the dependent variable. The explanatory power of the governance variables is substantially reduced compared to when *DiscEQ* is the dependent variable (0.0217 vs. 0.0709), and only two out of the seven governance variables are significant in the expected direction, whereas all seven are significant in the expected direction when *DiscEQ* is the dependent variable. Finally, we orthogonalize *CF*(*Incentives*) with respect to *EQ* and retain the residuals *ResCF*(*Incentives*) as the 'earnings quality-free' portion of incentives. The third column of Panel A reports results with *ResCF(Incentives)* as the dependent variable. The results are similar to when we use *CF(Incentives)* with a low explanatory power (0.0214) and only two governance variables significant in the expected direction. [13]

[13] As an additional test we repeat equation (2) using managerial incentives separately as the dependent variable. There is no single managerial incentive variable exhibiting the same significant associations with governance structures as *DiscEQ*. The only incentive variable with five out of the seven governance variables significant in the same direction as with *DiscEQ* is the inverse of *YrsListed* [we test the inverse as *DiscEQ* loads negatively on *YrsListed*]. To mitigate concern over the potential confounding effects, we refit the earnings quality model, excluding *YrsListed* from the list of incentives variables and re-run equation (2). This alternatively defined *DiscEQ* remains significantly associated with six governance variables in the expected direction. It is only the coefficient on *Stk%Dir* that looses significance. Yet once we allow

As our measure of innate earnings quality is also fitted on variables, a similar concern could arise about whether the corporate governance associations with *InnateEQ* are due to innate factors themselves. While it is true that Equation (1) includes a number of control variables associated with firm fundamentals, e.g. firm size, book to market, years listed, ROE and industrial classification, these are not the full set of innate factors. To further investigate this potential concern, we use the summary variable for innate factors described earlier, *CF*(*Innate_Fators*). Next, we orthogonalize *CF*(*Innate_Fators*) with respect to *EQ* and retain the residuals *ResCF*(*Innate_Fators*) as the 'earnings quality-free' portion of innate factors. We then repeat Equation (1) adding *ResCF(Innate_Fators)* as a control. Panel B of Table 6 reports the regression results. The coefficients on *InnateEQ* remain significant and in the predicted direction with all five governance variables.

We conclude from the results in Table 6 that the associations between *DiscEQ* and governance variables are robust to the underlying linkages between governance variables and incentives. Although *DiscEQ* is constructed through a fitting of earnings quality on incentive variables, it cannot be viewed as a summary variable for incentives. Also, incentives in and of themselves have limited and often inconsistent associations with governance variables, whereas the earnings quality effect of incentives, that is *DiscEQ*, has consistent and significant associations with all governance variables. The association between *InnateEQ* and governance variables is also robust to the linking of innate factors to governance variables. These results indicate that the earnings quality effects we have documented so far are not due to the underlying variables included in the fitting process of our measures.

6. Summary and conclusions

for the effect of *Stk%Dir* to differ across ranges of ownership (see footnote 12), the associations with *DiscEQ* become significant. The results show again a negative association between *DiscEQ* and *Stk%Dir* at lower ranges of ownership and a positive association for intermediate levels of ownership.

The expected sign and direction of causality in the relation between earnings quality and corporate governance differs depending on whether one views earnings quality as primarily innate or primarily discretionary in nature. The literature taking earnings quality as given hypothesizes that firms with inherent limitations in the ability of accounting numbers to reflect underlying economics (i.e., poor innate quality) opt for stronger corporate governance structures. The literature taking corporate governance structures as given hypothesizes that deficiencies in these structures facilitate greater exercise of discretion to manage earnings, or poorer discretionary earnings quality. These two streams in the literature have remained distinct as researchers tend to view earnings quality as either primarily innate or (the majority of studies) as primarily discretionary. However, variation in earnings quality stems both from firm fundamentals and from managerial incentives.

We employ a research design to measure the innate and discretionary component of earnings quality. We regress earnings quality on fundamental variables as well as variables capturing managerial incentives. The fitted values from fundamental variables represent innate earnings quality, the fitted values from the incentive variables represent discretionary earnings quality, and the residuals, finally, retains the noise in the earnings quality measure. With this research design we can jointly test both innate and discretionary quality measures in a corporate governance setting, something that has not been done previously, and we can test whether our measure of discretionary earnings quality is more powerful than traditional measures, which in prior studies show only weak and often inconsistent relations with corporate governance variables.

Consistent with both perspectives, we find that corporate governance structures are stronger when innate earnings quality is poor and that discretionary earnings quality improves with stronger governance structures. We further document that the results are consistent across corporate governance measures, and we confirm the findings of prior literature that traditional

residual-based measures of discretionary earnings quality, such as abnormal accruals, show weak and inconsistent relations with corporate governance variables when applied to our sample.

The evidence in this study offers a bridge between the two earnings quality perspectives in the governance literature by showing how earnings quality shapes and is shaped by corporate governance depending on its source. At the same result our results contribute to the literature examining the effects of governance literature. Larcker, Richardson and Tuna (2007) ascribe the weak and inconsistent relations between governance variables and earnings quality measures to measurement error in governance variables. Our results suggest that another reason that prior research has not produced a consistent set of results is measurement error in earnings quality proxies and the varying extent of innate and discretionary earnings quality within these proxies.

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Appendix A
Definition of variables in alphabetical order

Variable	Description
AA	Abnormal accruals based on the Jones (1991) model.
AbsAA	Absolute abnormal accruals based on the Jones (1991) model.
AbsPAAA	Absolute performance adjusted abnormal accruals based on Kothari et al. (2005).
AQ	The standard deviation of the firm's residuals from years *t−4* to year *t* from annual cross-sectional estimations of the modified Dechow and Dichev (2002) model, i.e. regressions of the firm's year *t* working capital accruals (TCA) on year *t*, *t−1*, and *t+1* cash flows from operations (CFO), the year *t* change in revenues (ΔREV) and the year *t* property, plant, and equipment (*PP&E*) (all variables scaled by average total assets), where the regression is estimated using data from *t* = 1961–2008.Because of the lead term in cash flows from operations the measure is lagged one year to ensure there is no conditioning on future information.
BigN	Equals 1 if the firm's auditor is one of the following audit firms, Arthur Andersen, Arthur Young, Coopers & Lybrand, Ernst & Young, Deloitte & Touche, KPMG Peat Marwick, PriceWaterhouse-Coopers, Touche Ross, 0 otherwise.
BM	The firm's book-to-market ratio.
BoardSize(#DIR)	Total number of directors on the board.
BoardStr	A composite variable representing the average within-sample percentile of *BoardSize(#DIR), Interlocking, #OthBoard* and *#OutDir*.
EQ	Common factor score obtained from a factor analysis of *AQ*, *AbsAA*, and *EarnVar*.
CF(Innate_Factors)	A common factor score of *Size*, σ(*CFO*), σ(*Sales*), *OperCycle*, *NegEarn*, *IntIntensity*, and *CapIntensity*.
CF(Incentives)	A common factor score of of all incentive variables, i.e. *IncentivesPay*, *MertonDD*, *SEO*, *ShareDeals*, *DebtIssues*, *MBE*, *POSΔEARN*, *POSEARN*, *YrsListed*, *BLifecycle, NegRet*, *BookTax*, *IndConcentration,* and *S&PMember*.
DiscEQ	*EQ* fitted on managerial incentives: executive compensation, distance to default, seasoned equity offerings, shares for shares acquisitions, debt issues, meeting or beating earnings targets, years listed, business life cycle stage, negative contemporaneous returns, tax aggressiveness, industry concentration, and S&P500 membership (see Appendix B).
EarnVar	Standard deviation of the firm's net income before extraordinary items (NIBE) scaled by total assets over years *t−6 to t*.
EIndex	The Bebchuk et al. (2008) entrenchment index based on six corporate governance provisions: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments.
ExecEqInc	A composite variable representing the average within-sample percentile of *EqinctTot* and *LtincTot*. *EqincTot* is the average percentage of total incentives represented by grants of stock options and restricted stock, i.e. directors' average value of options and restricted options grants over total compensation. *LtincTot* is the percentage of managers' total incentive plans represented by grants of options and restricted stock plus any payouts from long-term performance plans, i.e. directors' average value of options and restricted option grants and LTIPS payouts over total managerial compensation.
Financials	Equals 1 if the firm is in the banking business based on the 4-digit SIC code industry classifications identified in Fama and French (1997).
IndConcentration	The proportion of the market share of the top five firms in each industry over the total industry sales.
InnateEQ	*EQ* fitted on innate factors: operating cash flow volatility, sales volatility, operating cycle, intangible assets intensity and capital intensity (see Appendix B).
Interlocking	Equals 1 if the firm has an interlocking directorate, i.e. members of its board also serve on the board of another company.
ResCF(Incentives)	The residuals from panel regressions of *CF*(*Incentives*) on *EQ*.
ResCF(Innate_Factors)	The residuals from panel regressions of *CF(Innate_Factors)* on *EQ*.
ROE	Net income before extraordinary items divided by average book value of equity.
ShldConc	A composite variable representing the average within-sample percentile of *%Out*, *%Inst* and *%BlockInst*.
Stk%Dir	Percentage of stock held by executive directors.
Size	Natural logarithm of total assets.
Utilities	Equals 1 if the firm is a utility firm based on the 4-digit SIC code industry classifications identified in Fama and French (1997).
YrsListed	The number of years between year *t* and the year that the firm had its fist record on the CRSP

	files.
#OthBoard	Outside director expertise proxied using the average number of boards that outsider directors serve.
#OutDir	Total number of outside directors on the board.
%BlockInst	The percentage of stock held by institutions owning more than 5% of the firm's shares.
%Inst	The percentage of stock held by institutions.
%Out	The average percentage of stock held by outside investors, computed as the residual percentage held after deducting the percentage held by institutions and executive directors.

Appendix B
Extracting innate earnings quality (*InnateEQ*) and discretionary earnings quality (*DiscEQ*) following Athanasakou and Olsson (2012).

We model earnings quality as a function of innate factors and managerial incentives. The detailed form of the model is:

$$\begin{aligned} EQ_{j,t} = {} & a_0 + a_1 Size_{j,t} + a_2 \sigma(CFO)_{j,t} + a_3 \sigma(Sales)_{j,t} + a_4 OperCycle_{j,t} + a_5 NegEarn_{j,t} \\ & + a_6 IntIntensity_{j,t} + a_7 CapIntensity_{j,t} + a_8 IncentivesPay_{j,t} + a_9 MertonDD_{j,t} \\ & + a_{10} SEO_{j,t} + a_{11} ShareDeals_{j,t} + a_{12} DebtIssues_{j,t} + a_{13} MBE_{j,t} + a_{14} Pos\Delta Earn_{j,t} \\ & + a_{15} PosEarn_{j,t} + a_{16} YrsListed_{j,t} + a_{17} BLifecycle_{j,t} + a_{18} NegRet_{j,t} \\ & + a_{19} BookTax_{j,t} + a_{20} IndConcentration_{j,t} + a_{21} S\&PMember_{j,t} + e_{j,t} \end{aligned} \quad \text{(a)}$$

EQ	Common factor score obtained from a factor analysis of *AQ*, *AbsAA*, and *EarnVar*. Appendix A provides definitions for *AQ*, *AbsAA* and *EarnVar*.
Size	*N*atural logarithm of total assets
σ(CFO)	Standard deviation of the firm's cash flow from operations (scaled by average total assets) from years *t−6* to year *t*.
σ(Sales)	Standard deviation of the firm's sales revenues (scaled by average total assets) from years *t−6* to year *t*.
OperCycle	Log of the firm's average trade receivables period plus the average stockholding period. The trade receivables period is 360/(Sales/Average trade receivables) and the stockholding period is 360/(Cost of goods sold/average inventory).
NegEarn	Proportion of losses (negative *NIBE*) for the firm over years *t−6* to year *t*.
IntIntensity	The firm's reported R&D and advertising expense as a proportion of its sales revenues.
CapIntensity	Net book value of PP&E to total assets.
IncentivesPay	The firm's average executive compensation including the value of the option grants (e.g. salary, bonus, other annual, restricted stock grants, LTIP payouts, and value of options granted) for year *t* as a percentage over average total assets.
MertonDD	The probability of default based on the Merton distance to default model (Merton 1974).
SEO	Equals 1 if the change in the firm's common stock from year *t−1* to year *t* is higher than 5%, 0 otherwise.
ShareDeals	Equals 1 if the firm engages in a share for share acquisition, where the purchase consideration is only stock and the deal value is at least $10m, 0 otherwise.
DebtIssues	Equals 1 if the change in the firm's total debt from year *t−1* to year *t* is higher than 5%, 0 otherwise.
MBE	Net income before extraordinary items
PosΔEarn	Equals 1 when change in firm's net income before extraordinary items (NIBE) from year *t−1* to year *t* is non-negative, 0 otherwise.
PosEarn	Equals 1 when the firm's net income before extraordinary items (NIBE) is non-negative, 0 otherwise.
YrsListed	The number of years between year *t* and the year that the firm had its fist record on the CRSP files.
BLifecycle	Equals 1 if the stage of the firm's business life cycle is 1 (introduction) or 4−8 (shake-out or decline), and 2 if the stage of the business life cycle is 2 (growth) or 3 (mature), based on the 8 stages of the business life cycle identified by Dickinson (2011). Dickinson (2011) classify firms by business life cycle phases using the signs of the firm's cash flows from operating activities (CFO), cash flows from investing activities (CFInv) and cash flows from financing activities (CFFin) as follows: Stage Signs of flows 1. Introduction CFO (−) CFInv(−) CFFin(+) 2. Growth CFO (+) CFInv(−) CFFin(+) 4. Shake−out CFO (−) CFInv(−) CFFin(−) 3. Mature CFO (+) CFInv(−) CFFin(−) 5. Shake−out CFO (+) CFInv(+) CFFin(+) 6. Shake−out CFO (+) CFInv(+) CFFin(−) 7. Decline CFO (−) CFInv(+) CFFin(+) 8. Decline CFO (−) CFInv(+) CFFin (−)
NegRet	Equals 1 if the firm's annual cumulative returns are negative, 0 otherwise.
BookTax	The firm's book-tax difference, i.e. the difference between pre-tax income and total taxes to the statutory corporate tax rate, divided by average total assets.
IndConcentration	The proportion of the market share of the top five firms in each industry over the total industry sales.
S&PMember	Equals 1 if the company is a member of the S&P500, 0 otherwise. Equals 1 if the company is a member of the S&P500, 0 otherwise.

Appendix B (cont'd)
The fitted values from the innate factors represent innate earnings quality, while the fitted values from managerial incentive factors represent discretionary earnings quality as follows:

$$InnateEQ_{j,t} = \hat{a}_1 Size_{j,t} + \hat{a}_2 \sigma(CFO)_{j,t} + \hat{a}_3 \sigma(Sales)_{j,t} + \hat{a}_4 OperCycle_{j,t} + \hat{a}_5 NegEarn_{j,t} + \hat{a}_6 IntIntensity_{j,t} + \hat{a}_7 CapIntensity_{j,t} \quad \text{(b)}$$

$$DiscEQ_{j,t} = \hat{a}_8 IncentivesPay_{j,t} + \hat{a}_9 MertonDD_{j,t} + \hat{a}_{10} SEO_{j,t} + \hat{a}_{11} ShareDeals_{j,t} + \hat{a}_{12} DebtIssues_{j,t} + \hat{a}_{13} MBE_{j,t} + \hat{a}_{14} Pos\Delta Earn_{j,t} + \hat{a}_{15} PosEarn_{j,t} + \hat{a}_{16} YrsListed_{j,t} + \hat{a}_{17} BLifecycle_{j,t} + \hat{a}_{18} NegRet_{j,t} + \hat{a}_{19} BookTax_{j,t} + \hat{a}_{21} IndConcentration_{j,t} + \hat{a}_{20} S\&PMember_{j,t} \quad \text{(c)}$$

Table A shows the regression results of (a). The innate factors and managerial incentives explain 54.14% of the variation in *EQ*. Six of the innate factors are significant at conventional levels in the expected direction. Seven of the incentive variables are significant at the 10% level or better and in the expected direction. Customary caution is recommended against putting too much emphasis on statistical significance of individual coefficients in a situation with non-trivial collinearity among variables. Given the large sample size the coefficients are expected to be unbiased and should therefore produce unbiased fitted values of innate and discretionary earnings quality. When regressing *EQ* only on innate factors (results not tabulated), the explanatory power is 53%. When regressing *EQ* only on incentive variables there is a lower, but far from trivial, explanatory power of 27%. Consequently, there is substantial shared variation between innate and incentive variables.

When repeating equation (a) for the individual earnings quality measures, *AQ*, *σEarn* and *AbsAA*, results are qualitatively similar for all measures, except somewhat weaker for *AQ* (R^2=33.89%) and substantially weaker for *AbsAA* (R^2=13.21%). We also repeat equation (a) for absolute performance adjusted abnormal accruals, *AbsPAAA*, (Kothari et al. 2005) a measure which was built on a model originally designed to capture managerial discretion controlling for any innate variation attributed to operating performance. Innate factors and incentive variables explain only 10% of the variation in *AbsPAAA*. For all earnings quality measures, the innate variables have higher explanatory power than the incentive variables. Even for *AbsPAAA*, the adjusted R^2 using only the innate variables is 8%. We also repeat equation (a) excluding incentive variables that are not significant in the expected direction in Table A, i.e. *PosΔEarn, PosEarn, NegRet* and *S&PMember*.

Appendix B (cont'd)

TABLE A

Panel A: The determinants of earnings quality: innate factors and managerial incentives

Innate Variables	Pred. Sign	*EQ* Coef./ (*t-stat*)	Managerial Incentives Variables	Pred. Sign	*EQ* Coef./ (*t-stat*)
Intercept		−0.578***			
		(−10.25)	*IncentivesPay*	+	0.125***
Size	−	−0.010**			(5.28)
		(−2.37)	*MertonDD*	+	0.077**
σ(CFO)	+	3.685***			(1.96)
		(18.77)	*SEO*	+	0.010*
σ(Sales)	+	0.368***			(1.86)
		(11.66)	*ShareDeals*	+	0.020
OperCycle	+	0.027***			(1.36)
		(3.90)	*DebtIssues*	−	−0.013***
NegEarn	+	0.382***			(−2.69)
		(12.34)	*MBE*	+	0.006
IntIntensity	+	−0.041***			(1.53)
		(−2.84)	*PosΔEarn*	+	−0.017***
CapIntensity	−	−0.186***			(−3.32)
		(−9.48)	*PosEarn*	+	0.017
(continued in next column)					(1.62)
			YrsListed	−	−0.001**
					(−2.45)
			BLifecycle	−	−0.024***
					(−5.19)
			NegRet	+	−0.005
					(−0.55)
			BookTax	+	0.067
					(1.14)
			IndConcentration	+	0.099***
					(3.90)
			S&PMember	+	−0.000
					(−0.01)
			Observations		11,829
			Adj. R^2		0.5414

Panel B: Discretionary earnings quality and firm fundamentals

Variables	*DiscEQ* Coef./(*t-stat*)
Intercept	0.089***
	(12.17)
Size	−0.011***
	(−22.58)
σ(CFO)	0.253***
	(10.23)
σ(Sales)	0.004
	(0.90)
OperCycle	−0.004***
	(−3.62)
NegEarn	0.029***
	(5.09)
IntIntensity	0.008*
	(1.88)
CapIntensity	−0.036***
	(−7.91)
Observations	11,829
Adj. R^2	0.3834

The sample consists of 11,829 observations over the period 1992−2007 for 1,726 US firms with available accounting data in Compustat, stock return data in CRSP, analyst forecast data in I/B/E/S, mergers and acquisition data in SDC Platinum and executive compensation data in Execucomp. Definitions of variables are provided above.

Table 1

Panel A: Distributional statistics of earnings quality and corporate governance variables

Variable	N	Mean	Std	Q1	Median	Q3
EQ	5,504	-0.325	0.316	-0.544	-0.396	-0.183
AQ	5,504	0.036	0.024	0.019	0.030	0.047
σEARN	5,504	0.044	0.048	0.016	0.030	0.054
AbsAA	5,504	0.037	0.038	0.012	0.026	0.049
InnateEQ	5,504	0.262	0.210	0.119	0.219	0.369
DiscEQ	5,504	-0.013	0.041	-0.039	-0.017	0.008
BoardStr	5,504	49.485	13.884	39.500	49.500	59.500
BoardSize(#DIR)	5,504	6.197	1.319	5.000	6.000	7.000
#OutDir	5,504	0.670	0.170	0.571	0.700	0.800
Interlocking	5,504	0.010	0.036	0.000	0.000	0.000
#OthBoard	5,504	0.737	0.660	0.143	0.636	1.143
ShldConc	5,504	49.682	10.306	41.000	50.000	58.333
%Out	5,504	0.302	0.186	0.179	0.291	0.418
%BlockInst	5,504	0.167	0.189	0.549	0.684	0.798
%Inst	5,504	0.669	0.125	0.068	0.150	0.244
ExecEqInc	5,504	50.909	27.416	30.500	48.000	74.500
EqinctTot	5,504	0.362	0.403	0.158	0.335	0.518
LtincTot.	5,504	0.388	0.407	0.186	0.364	0.549
Stk%Dir	5,504	0.028	0.063	0.002	0.006	0.020
Size	5,504	7.623	1.398	6.599	7.488	8.536
BM	5,504	0.488	0.439	0.270	0.427	0.607
YrsListed	5,504	27.578	14.964	13.000	27.000	39.000
ROE	5,504	0.121	0.894	0.062	0.127	0.193
Financials	5,504	0.019	0.137	0.000	0.000	0.000
Utilities	5,504	0.055	0.228	0.000	0.000	0.000

Panel B: Pairwise Pearson(above) and Spearman (below the diagonal) correlations between earnings quality measures.

	EQ	*AQ*	*σEARN*	*AbsAA*
EQ	1	0.846	0.620	0.557
		<.0001	<.0001	<.0001
AQ	0.852	1	0.342	0.217
	<.0001		<.0001	<.0001
σEARN	0.610	0.397	1	0.191
	<.0001	<.0001		<.0001
AbsAA	0.497	0.216	0.191	1
	<.0001	<.0001	<.0001	
N	5,504			

The sample consists of 5,504 observations over the period 1992−2007 for 985 US firms with available accounting data in Compustat, stock return data in CRSP, analyst forecast data in I/B/E/S, mergers and acquisition data in SDC Platinum, executive compensation data in Execucomp, corporate governance data on Risk Metrics and ownership data on Thomson Reuters. *EQ* is the common factor of three earnings quality measures; accruals quality (*AQ*), earnings volatility (*EarnVar*) and absolute abnormal accruals (*AbsAA*). *AQ* is the standard deviation of the firm *j*'s residuals from years *t−4* to year *t* from annual cross-sectional estimations of the modified Dechow and Dichev (2002) model, i.e. regressions of the firm *j*'s year *t* working capital accruals on year *t*, *t−1*, and *t+1* cash flows from operations, the year *t* change in revenues and the year *t* property, plant, and equipment (*PP&E*) (all variables scaled by average total assets), where the regression is estimated using data from *t* = 1961–2008. *EarnVar* is the standard deviation of the firm *j*'s earnings before extraordinary items, scaled by total assets over years *t−6 to t*. *InnateEQ* is the value of *EQ* fitted on innate factors: size, operating cash flow volatility, sales volatility, operating cycle, intangible assets intensity and capital intensity. *DiscEQ* is the value of *EQ* fitted on managerial incentives: executive compensation, distance to default, seasoned equity offerings, shares for shares acquisitions, debt issues, meeting or beating earnings targets, years listed, business life cycle stage, negative contemporaneous returns, tax aggressiveness, industry concentration, S&P500 membership. *AbsAA* is the firm's absolute abnormal accruals based on the Jones (1991) model. *BoardStr* is a composite variable representing the average within-sample percentile of *BoardSize(#DIR), Interlocking, #OthBoard* and *#OutDir*. *BoardSize(#DIR)* is the total number of directors on the board. *Interlocking* equals 1 if the firm has an interlocking directorate, i.e. members of its board also serve on the board of another company. *#OthBoard* is outside director expertise proxied using the average number of boards that outside directors serve. *#OutDir* is the total number of outside directors on the board divided over the total size of the board. *ShldConc* is a composite variable representing the average within-sample percentile of *%Out*,

%Inst and *%BlockInst*. *%Out* is the average percentage of stock held by outside investors, computed as the residual percentage held after deducting the percentage held by institutions and executive directors. *%Inst* is the percentage of stock held by institutions. *%BlockInst* is the percentage of stock held by institutions owning more than 5% of the firm's shares. *ExecEqInc* is a composite variable representing the average within-sample percentile of *EqinctTot* and *LtincTot*. *EqincTot* is the average percentage of total incentives represented by grants of stock options and restricted stock, i.e. directors' average value of options and restricted options grants over total compensation. *LtincTot* is the percentage of managers' total incentive plans represented by grants of options and restricted stock plus any payouts from long-term performance plans, i.e. directors' average value of options and restricted option grants and LTIPS payouts over total managerial compensation. *Stk%Dir* is the percentage of stock held by executive directors. *Size* is the natural logarithm of total assets. *BM* is the firm's book-to-market ratio. *YrsListed* is the number of years between year *t* and the year that the firm *j* had its fist record on the CRSP files. *ROE* is net income before extraordinary items divided by average book value of equity. *Financials* equals 1 if the firm is in the banking business based on the 4-digit SIC code industry classifications identified in Fama and French (1997). *Utilities* equals 1 if the firm is a utility firm based on the 4-digit SIC code industry classifications identified in Fama and French (1997). *BigN* equals 1 if the firm's auditor is one of the following audit firms, Arthur Andersen, Arthur Young, Coopers & Lybrand, Ernst & Young, Deloitte & Touche, KPMG Peat Marwick, PriceWaterhouse-Coopers, Touche Ross, 0 otherwise.

Table 2

Pairwise Pearson(above) and Spearman (below the diagonal) correlations between variables

Variables	*InnateEQ*	*DiscEQ*	*BoardStr*	*#DIR*	*#OutDir*	*Inter-locking*	*#Oth Board*	*Shld Conc*	*%Out*	*%Block Inst*	*%Inst*	*Exec EqInc*	*Eqinct Tot*	*Ltinc Tot.*	*Stk% Dir*	*Size*	*BM*	*Yrs Listed*	*ROE*	*Fin ancials*	*Utilities*
InnateEQ	1.000	0.501	-0.129	-0.029	-0.056	-0.042	-0.069	0.192	-0.142	0.135	0.228	-0.025	-0.019	-0.051	0.015	-0.434	0.012	-0.342	-0.051	-0.151	-0.055
DiscEQ	0.471	1.000	-0.237	-0.077	-0.164	-0.029	-0.135	0.149	-0.151	0.119	0.191	0.066	0.045	0.015	0.086	-0.501	0.039	-0.504	-0.030	0.020	0.007
BoardStr	-0.134	-0.261	1.000	0.529	0.597	0.144	0.581	0.050	0.033	0.055	-0.042	0.068	0.018	0.045	-0.262	0.408	-0.062	0.385	0.007	-0.032	-0.058
#DIR	-0.040	-0.077	0.537	1.000	-0.001	0.005	0.082	-0.002	0.140	-0.115	-0.071	-0.126	-0.055	-0.054	-0.067	0.123	0.018	0.100	-0.001	0.016	-0.055
#OutDir	-0.059	-0.174	0.624	0.002	1.000	-0.232	0.280	0.107	-0.102	0.202	0.061	0.096	0.012	0.035	-0.304	0.222	-0.033	0.304	-0.010	-0.060	0.015
Interlocking	-0.081	-0.053	0.170	0.030	-0.210	1.000	0.028	-0.046	0.104	-0.117	-0.068	-0.014	0.000	0.003	0.045	0.023	0.038	0.021	-0.001	0.026	-0.025
#OthBoard	-0.053	-0.144	0.558	0.063	0.301	0.006	1.000	0.021	-0.106	0.155	0.022	0.148	0.084	0.103	-0.151	0.406	-0.066	0.280	0.010	-0.020	-0.056
ShldConc	0.226	0.189	0.028	-0.004	0.083	-0.046	0.007	1.000	-0.400	0.518	0.886	0.031	-0.002	-0.015	-0.370	-0.147	0.116	-0.136	-0.033	0.003	0.047
%Out	-0.199	-0.217	0.046	0.152	-0.093	0.107	-0.135	-0.418	1.000	-0.943	-0.569	-0.081	0.009	0.022	-0.124	0.034	0.136	0.242	0.015	-0.072	-0.058
%BlockInst	0.189	0.178	0.043	-0.129	0.185	-0.119	0.190	0.515	-0.941	1.000	0.577	0.128	0.017	0.009	-0.213	0.052	-0.139	-0.169	-0.013	0.063	0.074
%Inst	0.252	0.234	-0.049	-0.082	0.056	-0.067	0.046	0.934	-0.563	0.573	1.000	-0.024	-0.049	-0.071	-0.049	-0.225	0.126	-0.222	-0.041	0.008	0.022
ExecEqInc	-0.021	0.037	0.066	-0.124	0.089	-0.005	0.135	0.025	-0.069	0.118	-0.027	1.000	0.609	0.612	-0.142	0.234	-0.196	0.056	0.006	0.025	0.026
EqinctTot	0.016	0.073	0.040	-0.070	0.032	0.008	0.126	0.034	-0.009	0.049	-0.033	0.906	1.000	0.983	-0.076	0.132	-0.104	0.023	0.002	0.019	0.012
LtincTot.	-0.041	0.025	0.078	-0.076	0.066	0.015	0.145	0.012	0.011	0.038	-0.063	0.905	0.953	1.000	-0.093	0.175	-0.114	0.067	0.007	0.014	0.024
Stk%Dir	0.169	0.293	-0.329	-0.089	-0.295	0.022	-0.209	-0.085	-0.153	-0.043	0.094	-0.163	-0.132	-0.168	1.000	-0.254	0.014	-0.207	-0.007	0.024	-0.048
Size	-0.436	-0.520	0.408	0.116	0.228	0.059	0.383	-0.161	0.058	0.033	-0.226	0.234	0.160	0.222	-0.460	1.000	-0.090	0.543	0.019	-0.017	0.037
BM	-0.047	-0.037	-0.079	0.009	-0.019	0.036	-0.092	0.143	0.106	-0.117	0.154	-0.241	-0.197	-0.212	0.093	-0.111	1.000	-0.032	-0.066	-0.031	0.005
YrsListed	-0.341	-0.557	0.371	0.090	0.292	0.047	0.243	-0.149	0.263	-0.184	-0.217	0.052	0.007	0.070	-0.352	0.516	-0.008	1.000	0.023	-0.075	0.002
ROE	-0.187	-0.117	0.046	-0.061	0.038	-0.004	0.048	-0.177	-0.028	0.036	-0.188	0.126	0.072	0.107	-0.082	0.149	-0.556	0.107	1.000	0.008	0.002
Financials	-0.173	0.040	-0.035	0.024	-0.067	0.033	-0.014	0.003	-0.072	0.065	0.015	0.024	0.029	0.022	0.006	-0.022	-0.049	-0.077	0.057	1.000	-0.034
Utilities	-0.041	0.030	-0.055	-0.053	0.015	-0.028	-0.054	0.048	-0.067	0.082	0.032	0.026	0.017	0.033	-0.037	0.031	0.041	0.004	0.032	-0.034	1.000

Sample description and variables definitions: see Table 1 and Appendix A.

Table 3

Innate earnings quality and corporate governance

Panel A: The effect of innate earnings quality on board structure, outside directors, shareholders' concentration, directors' ownership, executive equity incentive plans and shareholders' rights. Parsimonious model.

Variables	*Predicted Sign*	*BoardStr* Coef. (*t*-stat)	*#OutDir* Coef. (*t*-stat)	*ShldConc* Coef. (*t*-stat)	*ExecEqInc* Coef. (*t*-stat)	*Predicted Sign*	*Stk%Dir* Coef. (*t*-stat)
Intercept		15.647***	0.433***	52.103***	6.653		125.836***
		(4.74)	(12.49)	(24.34)	(0.91)		(26.09)
InnateEQ	+	3.923**	0.040**	7.725***	12.315***	−	−9.604**
		(2.50)	(1.97)	(5.51)	(3.20)		(−2.48)
Size		4.304***	0.030***	−0.583**	5.382***		−9.943***
		(10.89)	(8.27)	(−2.27)	(5.79)		(−19.93)
Observations		5,504	5,504	5,504	5,504		5,504
Adj. R^2		0.1688	0.0508	0.0414	0.0614		0.2147

Panel B: The effect of earnings quality on board structure, outside directors, shareholders' concentration, directors' ownership, executive equity incentive plans and shareholders' rights. Model with various control variables.

Variables	*Predicted Sign*	*BoardStr* Coef. (*t*-stat)	*#OutDir* Coef. (*t*-stat)	*ShldConc* Coef. (*t*-stat)	*ExecEqInc* Coef. (*t*-stat)	*Predicted Sign*	*Stk%Dir* Coef. (*t*-stat)
Intercept		15.154***	0.462***	54.644***	2.923		158.982***
		(4.08)	(9.40)	(18.53)	(0.30)		(21.18)
InnateEQ	+	4.157***	0.033*	5.984***	9.418***	−	−7.568**
		(2.88)	(1.71)	(4.13)	(2.61)		(−1.99)
Size		2.728***	0.004	-1.297***	5.777***		−7.388***
		(6.97)	(0.92)	(-4.83)	(5.92)		(−11.62)
BM		−1.257*	−0.007	2.988***	−11.046***		2.058**
		(−1.94)	(−0.78)	(3.60)	(−3.63)		(1.98)
YrsListed		0.204***	0.003***	−0.089***	−0.165**		−0.285***
		(6.90)	(6.59)	(−4.20)	(−2.54)		(−5.05)
ROE		−0.044	−0.003	−0.212	−0.135		−0.802***
		(−0.33)	(−1.11)	(−1.02)	(−0.30)		(−3.61)
Financials		−0.365	−0.044	1.663	6.083		−4.784
		(−0.17)	(−1.37)	(0.99)	(1.49)		(−0.78)
Utilities		−4.579***	0.000	2.392**	0.903		−2.527
		(−2.80)	(0.02)	(2.22)	(0.40)		(−0.88)
Board_Str				0.052**	−0.198***		−0.119**
				(2.09)	(−3.17)		(−2.36)
#OutDir				5.161***	14.740***		−17.772***
				(2.60)	(4.22)		(−4.04)
ShldConc		0.137***	0.002***		0.148***		−0.481***
		(4.88)	(4.86)		(2.66)		(−8.44)
ExecEqInc		−0.021*	0.000**	0.021***			−0.050**
		(−1.70)	(2.05)	(2.66)			(−2.39)
Stk%Dir		−0.062***	−0.001***	−0.079***	−0.059**		
		(−5.58)	(−5.30)	(−7.56)	(−2.41)		
BigN		5.010***	0.036	0.918	6.779***		−1.744
		(4.15)	(1.45)	(0.53)	(3.23)		(−0.36)
Observations		5,504	5,504	5,504	5,504		5,504
Adj. R^2		0.2450	0.1475	0.1242	0.1120		0.2968

Sample description and variables definition: see Table 1 and Appendix A. The */**/*** indicate significance at the 0.1/0.05/0.01 levels (two-tailed). We report the coefficient estimates obtained from ordinary least squares (OLS) regressions of corporate governance mechanisms on innate earnings quality and other known determinants (Bushman et al. 2004). *t*-statistics in parentheses are based on robust standard errors clustered by year and firm to control for cross-sectional dependence and heteroskedastic and autocorrelated residuals.

Table 4

Corporate governance and earnings quality

Panel A: The effect of board structure, outside directors, shareholders' concentration, directors' ownership and audit assurance on earnings quality- comparison across various discretionary earnings quality constructs.

Variable	Pred. Sign	*DiscEQ* Coef./ (t-stat)	*AA* Coef./ (t-stat)	*AbsAA* Coef./ (t-stat)	*AbsPAAA* Coef./ (t-stat)	*ResDEQ* Coef./ (t-stat)
Intercept		0.013	-0.007	0.038***	0.044***	-0.080*
		(1.39)	(-0.96)	(6.19)	(7.66)	(-1.76)
BoardSize(#DIR)	−	−0.001**	−0.001*	0.002***	0.001***	0.009***
		(−2.22)	(−1.75)	(3.66)	(2.68)	(2.75)
Interlocking	−	−0.053**	0.044***	−0.037**	−0.027*	−0.280*
		(−2.29)	(2.74)	(−2.27)	(−1.68)	(−1.91)
#OthBoard	−	−0.006***	−0.000	−0.002*	−0.002*	0.015**
		(−2.60)	(−0.32)	(−1.90)	(−1.77)	(1.99)
#OutDir	−	−0.039***	0.005	−0.014*	−0.018**	0.006
		(−6.19)	(0.62)	(−1.73)	(−2.10)	(0.19)
%Inst	+	0.036***	0.004	0.005	0.008**	0.001
		(4.39)	(1.02)	(1.39)	(2.16)	(0.04)
Stk%Dir	+	0.033**	−0.018	0.015	0.017	0.157**
		(2.09)	(−1.41)	(1.20)	(1.56)	(2.00)
BigN	−	−0.011**	0.006	−0.003	−0.004	0.011
		(−2.35)	(0.95)	(−0.85)	(−0.92)	(0.33)
Observations		5,504	5,504	5,504	5,504	5,504
R^2*adj.*		0.0709	0.0020	0.0091	0.0098	0.0066

Panel B: The effect of board structure, outside directors, shareholders' concentration, directors' ownership and audit assurance on earnings quality- controlling for firm fundamentals

Variable	Pred. Sign	*DiscEQ* Coef./ (t-stat)	*DiscEQ* Coef./ (t-stat)	*AbsPAAA* Coef./ (t-stat)	*AbsPAAA* Coef./ (t-stat)
Intercept		0.007	−0.015**	0.041***	0.043***
		(1.03)	(−2.38)	(7.93)	(9.04)
BoardSize(#DIR)	−	−0.001**	−0.001**	0.002***	0.002***
		(−2.12)	(−2.55)	(3.13)	(3.18)
Interlocking	−	−0.026	−0.032	−0.013	−0.013
		(−1.35)	(−1.52)	(−0.94)	(−0.87)
#OthBoard	−	−0.003**	−0.004**	−0.000	0.001
		(−2.00)	(−2.43)	(−0.35)	(0.46)
#OutDir	−	−0.030***	−0.031***	−0.014*	−0.012
		(−7.06)	(−6.69)	(−1.66)	(−1.51)
%Inst	+	0.018***	0.020***	−0.001	−0.002
		(3.26)	(3.16)	(−0.33)	(−0.46)
Stk%Dir	+	0.018*	0.030**	0.009	0.001
		(1.67)	(2.51)	(0.92)	(0.07)
BigN	−	−0.001	−0.004	0.002	0.002
		(−0.40)	(−1.07)	(0.41)	(0.55)
CF(Innate_Factors)		0.029***		0.015***	
		(11.89)		(8.75)	
InnateEQ			0.092***		
			(9.18)		
InnateAbsPAAA					1.158***
					(9.27)
Observations		5,504	5,504	5,504	5,504
R^2*adj.*		0.3451	0.2860	0.0807	0.0809

Sample description and variables definition: see Table 1 and Appendix A. The */**/*** indicate significance at the 0.1/0.05/0.01 levels (two-tailed). We report the coefficient estimates from ordinary least squares (OLS) regressions of the earnings quality common factor, *EQ,* its components (*DiscEQ*, *InnateEQ*, *ResDEQ*) and alternative measures of earnings quality (*AA*, *AbsAA*, *AbsPAAA*) on corporate governance mechanisms. *t*-statistics in parentheses are based on robust standard errors clustered by year and firm to control for cross-sectional dependence and heteroskedastic and

autocorrelated residuals.

Table 5
Innate earnings quality, corporate governance and discretionary earnings quality

Variables	*Predicted Sign*	*DiscEQ* Coef./ (t-stat)	*DiscEQ* Coef./(t-stat)
Intercept		−0.017***	−0.074***
		(−3.01)	(−5.55)
BoardStr	−	−0.001***	−0.000***
		(−9.89)	(−4.80)
%Inst	+	0.017**	0.092***
		(2.57)	(4.95)
Stk%Dir	+	0.027**	0.078***
		(2.07)	(4.17)
BigN	−	−0.004	0.020
		(−1.05)	(1.60)
InnateEQ(Q)	+	0.012***	0.028***
		(10.62)	(7.99)
*BoardStr*InnateEQ(Q)*	−		−0.000*
			(−1.87)
*%Inst*InnateEQ(Q)*	−		−0.019***
			(−5.17)
*Stk%Dir*InnateEQ(Q)*	−		−0.028***
			(−2.94)
*BigN*InnateEQ(Q)*	−		−0.037**
			(−2.01)
Observations		5,504	5,504
Adj. R-squared		0.2346	0.2524

Sample description and variables definition: see Table 1 and Appendix A. *InnateEQ(Q)* are quintiles of *InnateEQ* by year. The */**/*** indicate significance at the 0.1/0.05/0.01 levels (two-tailed). We report the coefficient estimates from ordinary least squares (OLS) regressions of discretionary earnings quality (*DiscEQ*) on corporate governance mechanisms, quintiles of innate earnings quality *InnateEQ(Q)* and interaction terms. *t*-statistics in parentheses are based on robust standard errors clustered by year and firm to control for cross-sectional dependence and heteroskedastic and autocorrelated residuals.

Table 6

Governance and earnings quality: Is it *Innate*EQ and *DiscEQ*, or the underlying variables?

PanelA: Corporate governance and earnings quality

Variable	Pred. Sign	*DiscEQ* Coef./ (*t*-stat)	*CF(Incentives)* Coef./ (*t*-stat)	*ResCF(Incentives)* Coef./ (*t*-stat)
Intercept		0.013	0.192**	0.224***
		(1.39)	(2.32)	(2.76)
BoardSize(#DIR)	−	−0.001**	0.015**	0.013**
		(−2.22)	(2.44)	(2.23)
Interlocking	−	−0.053**	−0.200	−0.030
		(−2.29)	(−1.41)	(−0.26)
#OthBoard	−	−0.006***	−0.092***	−0.087***
		(−2.60)	(−3.37)	(−3.40)
#OutDir	−	−0.039***	−0.262***	−0.232***
		(−6.19)	(−3.64)	(−3.43)
%Inst	+	0.036***	−0.071	−0.132*
		(4.39)	(−0.87)	(−1.81)
Stk%Dir	+	0.033**	−0.236*	−0.311**
		(2.09)	(−1.75)	(−2.54)
BigN	−	−0.011**	−0.013	0.013
		(−2.35)	(−0.29)	(0.35)
Observations		5,504	5,504	5,504
R^2*adj.*		0.0709	0.0217	0.0214

Panel B: Earnings quality and corporate governance

Variables	*Predicted Sign*	*BoardStr* Coef. (*t*-stat)	*#OutDir* Coef. (*t*-stat)	*ShldConc* Coef. (*t*-stat)	*ExecEqInc* Coef. (*t*-stat)	*Predicted Sign*	*Stk%Dir* Coef. (*t*-stat)
Intercept		15.110***	0.462***	54.607***	2.806		15.819***
		(4.07)	(9.39)	(18.38)	(0.29)		(20.93)
InnateEQ	+	3.860**	0.032	5.754***	8.637*	−	−8.527**
		(2.33)	(1.33)	(3.60)	(1.93)		(−2.00)
Size		2.745***	0.004	-1.284***	5.820***		−7.334***
		(6.98)	(0.91)	(-4.65)	(5.94)		(−10.84)
ResCF(InnateFactors)		0.199	0.001	0.155	0.524		0.644
		(0.37)	(0.09)	(0.33)	(0.46)		(0.49)
Controls		YES	YES	YES	YES		YES
Observations		5,504	5,504	5,504	5,504		5,504
Adj. R^2		0.1688	0.0508	0.0414	0.0614		0.2147

Sample description and variables definition: see Table 1 and Appendix A. *CF(Incentives)* is a common factor of all managerial incentive variables, i.e. *IncentivesPay*, *MertonDD*, *SEO*, *ShareDeals*, *DebtIssues*, *MBE*, *POSΔEARN*, *POSEARN*, *YrsListed*, *BLifecycle, NegRet*, *BookTax*, *IndConcentration,* and *S&PMember*. *IncentivesPay* is the firm *j*'s average executive compensation including the value of the option grants (e.g. salary, bonus, other annual, restricted stock grants, LTIP payouts, and value of options granted) for year *t* scaled by average total assets. *MertonDD* is the probability of default based on the Merton distance to default model (Merton 1974). *SEO* equals 1 if the change in the firm *j*'s common stock from year *t−1* to year *t* is higher than 5%, 0 otherwise. *ShareDeals* equals 1 if the firm *j* engages in a share for share acquisition, where the purchase consideration is only stock and the deal value is at least $10m, 0 otherwise. *DebtIssues* equals 1 if the change in the firm *j*'s total debt from year *t−1* to year *t* is higher than 5%, 0 otherwise. *MBE* equals 1 if the median analyst earnings forecast outstanding at the firm *j*'s earnings announcement date is equal or higher than its realized earnings per share, 0 otherwise. *POSΔEARN* equals 1 when change in firm *j*'s net income before extraordinary items from year *t−1* to year *t* is non-negative, 0 otherwise. *POSEARN* equals 1 when the firm *j*'s net income before extraordinary items is non-negative, 0 otherwise. *YrsListed* is the number of years between year *t* and the year that the firm *j* had its fist record on the CRSP files. *BLifecycle* equals 1 if the stage of the firm *j*'s business life cycle is 1 (introduction) or 4−8 (shake-out or decline), and 2 if the stage of the business life cycle is 2 (growth) or 3 (mature), based on the 8 stages of the business life cycle identified by Dickinson (2011). *NegRet* equals 1 if the firm *j*'s annual cumulative returns are negative, 0 otherwise. *BookTax* is the firm *j*'s book-tax difference, i.e. the difference between pre-tax income and total taxes to the statutory corporate tax rate, divided by average total assets. *IndConcentration* is the proportion of the market share of the top five firms in each industry over the total industry sales. *S&PMember* equals 1 if the company is a member of the S&P500, 0 otherwise. *ResCF(Incentives)* is the residuals from panel regressions of *CF(Incentives)* on *EQ*. *ResCF(Incentives)* is the residuals from panel regressions of *CF(Incentives)* on *EQ*. *CF(Innate_Factors)* is the common factor of innate factors: size, operating cash flow volatility, sales volatility, operating cycle, intangible assets intensity and capital intensity (*Size*, σ(*CFO*), σ(*Sales*), *OperCycle*, *NegEarn*, *IntIntensity* and *CapIntensity*. *Size* is the natural logarithm of total assets. *σ*(*CFO*) is the standard deviation of the firm *j*'s cash flow from operations (scaled by average total assets) from years *t−6* to year *t*. *σ*(*Sales*) is the standard deviation of the firm *j*'s sales revenues (scaled by average total assets) from years *t−6* to year *t*. *OperCycle* is the log of the firm *j*'s average trade receivables period plus the average stockholding period. The trade receivables period is 360/(Sales/Average trade receivables) and the stockholding period is 360/(Cost of goods sold/average inventory). *NegEarn* is the proportion of losses (negative net income before extraordinary items) for firm *j* over years *t−6* to year *t*. *IntIntensity* is the sum of the firm *j*'s reported R&D and advertising expense as a proportion of its sales revenues. *CapIntensity* is the ratio of the net book value of PP&E to total assets. *ResCF(Innate_Factors)* is the residuals from panel regressions of *CF(Innate_Factors)* on *EQ*. The */**/*** indicate significance at the 0.1/0.05/0.01 levels (two-tailed). *t*-statistics in parentheses are based on robust standard errors clustered by year and firm to control for cross-sectional dependence and heteroskedastic and autocorrelated residuals.