Earnings Quality and Corporate Governance

Vasiliki Athanasakou
London School of Economics

Per Olsson
ESMT European School of Management and Technology

Abstract: We develop and test the proposition that earnings quality reflects both the scope for moral hazard (when caused by volatile business fundamentals) and the outcome of the moral hazard (when caused by management's discretionary reporting choices). As such, earnings quality can exhibit opposite sign associations with corporate governance depending on its source: business fundamentals (innate quality) and managerial incentives (discretionary quality). We develop a methodology to identify and create empirical measures for innate and discretionary earnings quality. We find that discretionary earnings quality improves with more effective governance structures, and that such structures exist when innate earnings quality is poor. We further document interaction effects, i.e., corporate governance structures being increasingly effective on discretionary earnings quality as innate quality worsens. The study highlights the importance of specifying the source of earnings quality effects when researching associations with corporate governance as a theoretical matter as well as in the empirical design.

Keywords: earnings quality, business model, corporate governance, earnings management, accruals.

Corresponding author: Per Olsson, ESMT European School of Management and Technology, Schlossplatz 1, 10178 Berlin, Germany; per.olsson@esmt.org. Vasiliki Athanasakou, Department of Accounting, London School of Economics, Houghton Street WC2A 2AE, UK; v.athanasakou@lse.ac.uk. We appreciate helpful comments from workshop participants at Bristol University, Cass Business School, Cardiff University, Copenhagen Business School, Duke University, Edinburgh Business School, Erasmus University, ESMT, Exeter University, HEC Lausanne, Kings College London, London School of Economics, Ohio State University, Stockholm School of Economics, Tilburg University, the Tsinghua University International Corporate Governance Conference, University of Maastricht, University of Manchester, and the University of Memphis.

1. Introduction

The relation between corporate governance and earnings quality is an issue that has proved elusive and often contentious among accounting researchers.[1] One reason is that the empirical literature that examines earnings quality and corporate governance has found weak and inconsistent results (Larcker et al. 2007). A more fundamental reason is the difficulty in identifying linkages in situations where various information structures can both affect governance structures and be affected by them (Armstrong et al. 2010, Ferreira et al. 2011).

In this study we develop and test the proposition that earnings quality reflects both the scope for moral hazard (earnings quality issues associated with volatile business fundamentals) and the outcome of moral hazard (earnings quality issues associated with management's discretionary reporting choices). As a consequence, earnings quality and corporate governance are likely to have both a negative and a positive association. Specifically, information issues associated with the volatility of the business model (poor innate earnings quality) are likely to increase the scope for moral hazard and therefore create the need for better monitoring and governance (Demsetz and Lehn 1985). More effective monitoring in turn restrains hazardous outcomes, including financial reporting outcomes, and therefore lessens earnings quality issues associated with managerial intent (discretionary earnings quality). In addition, these associations also imply an offsetting interaction effect: the influence and effectiveness of governance structures over discretionary earnings quality should increase with business model volatility; that is, in situations when innate earnings quality already suffers from volatile business fundamentals. Depending on its source, therefore, earnings quality can exhibit distinct, but opposite and offsetting, individual associations with corporate governance structures, leading to the appearance of a weak (or even no) *overall* association between earnings quality and governance.

[1] We are mindful of the challenge in using very broad concepts of 'earnings quality' and 'corporate governance' as well as doubts about what constitutes 'good' or 'bad' earnings quality or governance in specific contexts (e.g., Larcker et al. 2007, Brickley and Zimmerman 2010, Nelson and Skinner 2013). While we use such broad terms to discuss the initial motivation and general hypotheses, we conduct actual tests using context-specific operational constructs.

An important empirical implication of these arguments is the role of the operational measure of earnings quality, especially the extent to which it is influenced by managerial discretion versus business fundamentals. Commonly used measures in the literature, such as abnormal accruals, earnings persistence, earnings smoothness, accruals quality, etc., are influenced by a company's business model and operating environment as well as by discretionary financial reporting choices (Dechow et al. 2010). Also measures originally designed to isolate managerial discretion, such as abnormal accruals, are substantially influenced by, or even dominated by, business model volatility (Zimmerman 2013, Owens et al. 2015).

Isolating managerial discretion is particularly difficult in governance research. Simply controlling away the effect of volatile fundamentals is not optimal, because it can bias results towards zero (since governance is likely to be more effective precisely in situations where there is higher scope for moral hazard, i.e., where fundamental business model volatility is high). Conversely, if the researcher is interested in the other part of the relation, i.e. the effect of earnings quality on governance, earnings quality measures partially influenced by managerial discretion may exhibit weak or inconsistent associations with governance. In sum, specifying the source of earnings quality and tailoring the earnings quality measure appropriately are likely to be a first order research design considerations in governance research.

We develop a methodology to identify and create empirical measures for two major forces that shape earnings quality, volatility in business fundamentals and managerial incentives. This allows us to simultaneously examine both types of associations between earnings quality measures and governance structures, as well as investigate interaction effects between the two. The empirical design starts with a very broad and generic earnings quality (*EQ*) measure, essentially capturing volatility in earnings and accruals.[2] Next, we regress *EQ* on two sets of economic determinants, based on economic theory and prior literature. One set of determinants

[2] Our main earnings quality measure, *EQ*, is the common factor score of accruals quality (Dechow and Dichev 2002), absolute abnormal accruals from the modified Jones (1991) model, and earnings variability. The exact details are in Section 3.2 and Appendix B.

captures firm fundamentals, the other captures incentives for discretionary reporting choices. The fitted value of *EQ* on fundamental variables is the measure of innate earnings quality, i.e., variation in earnings quality associated with the firm's fundamentals. The fitted value of *EQ* on incentive variables is the measure of discretionary earnings quality, i.e., variation in earnings quality associated with managerial incentives. We use several fundamental variables suggested in prior literature, such as sales volatility, cash flow volatility, intangibles intensity, etc. We follow Fields et al. (2001) in identifying three categories of incentive variables for discretionary accounting choices: contractual arrangements, asset pricing considerations, and influencing external parties.[3] We follow prior literature also in identifying corporate governance variables, either direct monitoring measures such as board structure variables, or inverse measures, such as variables capturing managerial entrenchment.

We first conduct construct validity tests on our earnings quality measures. We begin with a governance-related regulatory event affecting all firms, the passage of the Sarbanes-Oxley legislation (SOX) in 2002. While there is some disagreement in the literature on the interpretation of individual corporate governance variables, we believe the predictions for SOX are more unambiguous. SOX aimed to restrict, at least to a degree, managerial discretion in financial reporting and disclosure choices to restore investors' confidence in the integrity of external financial reporting. There was no explicit purpose to affect business fundamentals. Consequently, we expect discretionary earnings quality to significantly improve in the post-SOX period but innate earnings quality to remain unaffected. Results confirm these predictions. We next test accounting restatements, distinguishing between intentional misstatements (fraud, irregularities and misrepresentations) and errors (remaining restatements). We find that

[3] We also believe that directly modelling earnings quality on managerial incentives has the potential to offer increased power compared to traditional measures of managerial discretion. For example, in the many versions of the Jones (1991) model noise and measurement error in the left-hand side accruals variable end up in the residual and therefore becomes part of the discretionary accruals measure, arguably lowering the power of such research designs. We further note that direct modeling of earnings quality on managerial incentives is conceptually consistent with the Securities and Exchange Commission's Accounting Quality Model. A relevant speech by the SEC Chief Economist is available at: http://www.sec.gov/News/Speech/Detail/Speech/1365171491988#.U3U3FN5VbwE.

intentional misstatements are significantly associated with poor discretionary earnings quality but unrelated to innate earnings quality, whereas misstatements due to errors are associated with poor innate earnings quality but unrelated to discretionary quality. Finally we document that innate earnings quality is significantly more stable over time than is discretionary earnings quality, consistent with the more stable (dynamic) nature of the business model (managerial discretion). We believe the results of these initial tests support the construct validity of the earnings quality measures.

We next test our basic hypothesis that innate and discretionary earnings quality have opposite-sign associations with corporate governance in a simple design that is held constant for both innate and discretionary quality. Specifically, we form a composite corporate governance score (comprised of board structure variables and ownership variables). We find that higher levels of the governance composite score are associated with better discretionary earnings quality, and that poorer innate earnings quality is associated with higher levels of the governance score (all results are significant at the 5% level or better, depending on the specification).

In the main tests, we disaggregate corporate governance into five variables: *BoardSize* (proximity to firm-size-quartile average board size), *OutsideDirectors* (fraction of outside directors), *DirectorExpertise* (board members with industry expertise), *InsiderOwnership*, and *ShareholderConcentration* (a composite variable capturing dispersed ownership in general as well as institutional holdings and block holdings).[4] In the test of discretionary earnings quality on governance variables, all five variables are significant at the five percent level or better in the expected direction. Discretionary earnings quality improves with better board size, more outside directors, more directors with industry expertise, less insider ownership and less concentrated ownership (the significance of outside directors is, however. sensitive to control variables). The

[4] We use these variables because they have been use in both strands of the literature (viewing earnings quality as endogenous and viewing corporate governance as endogenous, respectively). We are aware of the debate about the validity of certain corporate governance variables (e.g., Larcker et al. 2007, Armstrong et al. 2010, Brickley and Zimmerman 2010). We discuss disagreements about the interpretation as we present results and conduct sensitivity analysis with alternative measures.

explanatory power is substantially higher than in many comparable studies. To test for interaction effects, we interact governance factors with quartile ranks of innate earnings quality. *BoardSize*, *DirectorExpertise*, *InsiderOwnership*, and *ShareholderConcentration* have significant (at the five percent level or better) interaction effects, indicating that as innate earnings quality worsens, governance becomes more effective in improving discretionary earnings quality.

We complete the main analysis with evidence on how corporate governance variables are associated with the underlying innate earnings quality. These tests show that as innate earnings quality worsens, companies have more outside directors, more directors with industry expertise, less insider ownership and more concentrated ownership (significant at the five percent level or better; board size is not significant in this specification). Following Demsetz and Lehn (1985), we interpret these findings as evidence on governance responses in situations with underlying business volatility where the scope for moral hazard is high due to information quality issues.

In secondary tests, we probe our framework using traditional measures of earnings quality. We find that residual-based discretionary earnings quality measures, specifically absolute abnormal accruals from a modified Jones (1991) model and absolute performance-adjusted abnormal accruals (Kothari et al. 2005) exhibit reasonably consistent associations with some of the governance variables, but they have low explanatory power. Other commonly used measures, such as earnings smoothness or the frequency of reporting consecutive small positive earnings surprises, exhibit mixed, or even opposite associations with governance variables. We view these results as echoing the implications of our proposition that existing measures of earnings quality may still be highly correlated with business environment instability and therefore exhibit the average effect of an ex-ante proxy for the scope for moral hazard rather than an outcome variable. When using stock return volatility instead of innate earnings quality as a proxy for a volatile business environment, we document similar, albeit weaker, interaction effects, indicating more effective governance in more volatile business environments. We believe this,

admittedly weak, evidence with alternative empirical measures supports the general theoretical framework while at the same time highlighting the higher power of our research design.

Results are generally robust to additional sensitivity tests. First, following Ferreira et al. (2011), we test for reverse causality and omitted correlated variables due to the endogenous nature of both discretionary earnings quality and of corporate governance. Results are robust to these issues. Second, statistically fitted 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. Robustness tests indicate that the underlying innate and incentive variables do not explain the results in our research setting. Finally, we note that our measures of innate and discretionary earnings quality rely on the identification of factors that capture business fundamentals and managerial incentives. We deliberately do not take a stance on the "correct" identification; rather, we 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 believe we contribute to the literature in three steps. First, we develop a more complete economic framework by combining and further developing arguments from two (thus far) distinct strands in the literature, the first one examining the effects of information structures on governance and the second one examining the effect of governance on financial reporting outcomes. Second, we develop earnings quality measures that incorporate business model effects and effects of management incentives and that, unlike traditional measures, allow for interactions between the two types of variation in earnings quality. Third, we employ these measures in a corporate governance setting, which enables us to show, in a single framework, how earnings quality can both shape and be shaped by corporate governance. Finally, we note that prior research attributes conflicting hypotheses and mixed and inconsistent results in the earnings quality–corporate governance association to the endogeneity of the governance structures (Armstrong et al. 2010) and to measurement error in the governance constructs (Larcker et al.

2007). Our analysis suggests that the complex construct of earnings quality also plays an important 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 outlines the research design. Section 4 describes the sample and the main results. Section 5 concludes.

2. The role of earnings quality and the role of corporate governance

2.1 Theoretical framework

Information and properties of information play a crucial role in the literature on moral hazard. Moral hazard issues are likely to be more acute in less-than-stable business environments. For example, Demsetz and Lehn (1985) argue that when business models and operating environments are characterized by volatility and complexity, the scope for moral hazard is high, as are monitoring costs, because of information frictions. At the same time, it is precisely in volatile and complex situations that managerial discretion is likely to matter substantially for the firm's economic outcomes.[5] For investigations of associations between earnings quality and corporate governance this observation is important, because earnings quality reflects issues associated with business volatility as well as managerial discretion (e.g., Dechow et al. 2010, Dichev et al. 2013). Following such arguments, one would expect poor earnings quality, when caused by business volatility, to reflect the scope of moral hazard and to be associated with better governance. At the same time, if governance structures are effective in restraining hazardous outcomes, one would expect better governance to be associated with better earnings quality

[5] Demsetz and Lehn phrase it as follows: "Firms that transact in markets characterized by stable prices, stable technology, stable market shares, and so forth are firms in which managerial performance can be monitored at relatively low cost. In less predictable environments, however, managerial behavior simultaneously figures more prominently in a firm's fortunes and becomes more difficult to monitor. Frequent changes in relative prices, technology, and market shares require timely managerial decisions concerning redeployment of corporate assets and personnel. Disentangling the effects of managerial behavior on firm performance from the corresponding effects of these other, largely exogenous factors is costly, however. Accordingly, we believe that a firm's control potential is directly associated with the noisiness of the environment in which it operates. The noisier a firm's environment, the greater the payoff to owners in maintaining tighter control."

through the governance effect on managerial discretion. In addition, interaction effects are likely, since it is precisely when the underlying volatility is high, and innate earnings quality is poor, that it can pay off for firms to have effective monitoring. In the limit, corporate governance could even cancel out earnings quality effects associated with a volatile business environment; however, we believe that to be unlikely as a practical matter.

Both researchers and practitioners have long acknowledged that there are more fundamental, or innate, elements in earnings quality as well as important discretionary elements (see, for example, Francis et al. 2008 and Dechow et al. 2010 for research overviews, and Dichev et al. 2013 for a survey of practitioner views). Following prior literature, we term earnings quality effects associated with business fundamentals *innate earnings quality* and earnings quality effects associated with managerial intent *discretionary earnings quality*. Following the arguments above, we expect firms to invest in more effective governance structures when innate earnings quality is poor, and we expect discretionary earnings quality to be better when corporate governance is more effective. Interaction effects between innate and discretionary earnings quality arise because innate earnings quality effects caused by business fundamentals, e.g., revenue and cash flow volatility or operating losses, can both enable and create incentives for earnings management.[6] Absent corporate governance we expect discretionary earnings quality to be poor (for example, because of earnings management) when innate quality is poor. Considering governance, however, firms are likely to invest in more effective (and costly) governance mechanisms precisely when innate earnings quality is poor. In summary, we expect (i) poor innate earnings quality to be associated with stronger corporate governance, ii) stronger corporate governance to be associated with better discretionary earnings quality, and (iii) the association

[6] Consider, as a simple 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 capital market consequences (Graham et al. 2005).

between corporate governance and discretionary earnings quality to be more pronounced when innate earnings quality is poor.

2.2 Implications and prior research

Prior research has examined both directions of causality, corporate governance on earnings quality and earnings quality on corporate governance, but mostly examined causal links separately and generated predictions accordingly. Much prior research has assumed a positive association between corporate governance and earnings quality, with some more recent research considering the possibility of either a positive or a negative association, although not a simultaneous/joint effect. We believe the economic framework described in Section 2.1 has implications for both hypotheses and interpretations of results in prior literature.

Several studies investigate whether deficiencies in governance structures facilitate greater exercise of discretion to manage earnings, i.e., they hypothesize that earnings quality responds to governance structures, specifically that poor earnings quality is associated with weaker corporate governance structures (e.g., Holthausen et al. 1995, Klein 2002, Larcker and Richardson 2004, Peasnell et al. 2005, Larcker et al. 2007, Bowen et al. 2008). Few studies set out to investigate how earnings quality shapes governance structures. An exception is Bushman et al. (2004), who argue that firms with information quality issues (in their case low earnings timeliness) have higher monitoring needs and therefore build governance structures to enforce internal and external monitoring.[7]

In their review article about information environments, corporate governance and debt contracting, Armstrong et al. (2010) highlight the endogenous nature of corporate governance and the conflicting hypotheses about the role of the information environments and the role of corporate governance. So far the literature has responded to this challenge by focusing on one direction of causality and working with econometric techniques (Ferreira et al. 2011) or natural

[7] Similar arguments for other types of information attributes (and other determinants of corporate governance) can be found in Linck et al. (2008), Duchin, et al. (2010), and Ferreira et al. (2011), who consider costs and benefits of corporate governance arrangements in response to issues with information structures.

experiments where there are exogenous shocks to governance (Armstrong et al. 2012).[8] We follow an alternative way by building a single theoretical framework and develop an empirical methodology that accommodates both linkages simultaneously: information affecting governance and governance affecting information. In doing so we tailor the earnings quality definitions and framework to fit the theory behind each test, thereby following the recommendations in Dechow et al. (2010) to use test- and/or context-specific measures of earnings quality.

From an empirical perspective our framework implies that the result of an association test between earnings quality and corporate governance will depend crucially on the extent that the earnings quality measure is dominated by effects of fundamentals or the effects of managerial discretion or whether it is a mix of the two. Dechow et al. (2010) survey several widely used earnings quality measures (abnormal accruals, earnings persistence, accruals quality, smoothness, timeliness, being-close-to-benchmarks, etc.) and comment that a downside to such measures is that they contain the effects of both the fundamental earnings process and the effects of intentional manipulation, i.e., they will be a mix of innate and discretionary earnings quality. To the extent that different quality measures are differentially influenced by innate and discretionary determinants (or if studies have otherwise to varying degrees controlled for them), one would expect mixed results in association tests depending on the earnings quality metric, and generally weak results if the effects of fundamentals and discretion on earnings quality cancel each other out to some degree.

Extant empirical studies provide conflicting evidence on the association between corporate governance and information structures (Armstrong et al. 2012). For example, Larcker et al. (2007) summarize the literature that investigates the effects of governance on earnings quality and other accounting outcomes as follows: "The results are frequently contradictory and a

[8] Ferreira et al. (2011) conclude that price informativeness affects governance structures (that is, the primary link is information affecting governance), and they test for endogeneity and reverse causality using various econometric techniques. Armstrong et al. (2012) use the change in states' takeover legislation in the late 1980s and investigate its effect on information structures (that is, the primary link is governance affecting information).

consistent set of empirical results has yet to emerge regarding the importance of corporate governance for understanding accounting outcomes and organizational performance" [p. 964]. In their own study, Larcker et al. also find mixed results when investigating the effects of various corporate governance measures on abnormal accruals. Larcker et al. ascribe mixed results in part to difficulties with corporate governance measures. We conjecture that differences in results in prior literature may, at least in part, be a consequence of different earnings quality measures containing effects of both fundamentals and managerial discretion, which, as argued above, have different-sign predicted associations with governance structures.[9] Results are also mixed in the more limited literature that investigates the effects of information structures on governance. Bushman et al. (2004) find only partial evidence of an association between poor earnings timeliness and stronger internal and external monitoring.[10] While Ferreira et al. (2011) also find that poor earnings informativeness induces more internal monitoring, Linck et al. (2008) document a negative association between proxies for information acquisition costs (such as stock return volatility) and board monitoring.

3. Earnings quality and corporate governance variables

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

[9] Most empirical studies do not report results on multiple earnings quality measures while holding corporate governance constructs constant, making it hard to get indications from prior literature on this issue. An exception is Bowen et al. (2008, Table 3), who, for a sample of S&P firms 1992-1995, document associations between three commonly used earnings quality measures meant to capture managerial discretion (abnormal accruals, smoothing, and small earnings surprises) as well as a composite quality measure and ten corporate governance proxies (capturing board characteristics, ownership, executive compensation and auditing). For none of the ten governance proxies are associations significant and consistent across earnings quality proxies (for four of the governance proxies the earnings quality association is even both significantly positive and significantly negative depending on the earnings quality proxy, holding all else constant). We believe this result indicates that the choice of earnings quality measure can be important in corporate governance research. It should be noted Bowen et al.'s research questions are different from ours, so Table 3 is not the central part of their article.

[10] For a sample of Fortune 1000 firms in 1994, Bushman et al. (2004) use earnings timeliness as an exogenous earnings quality measure, and find that four out of eight governance variables are significantly associated with it.

3.1 Measuring earnings quality

Prior literature uses various metrics for earnings quality, several based on earnings attributes and others on accruals properties. Ideally, we want a very general measure as a starting point, because we will further derive innate and discretionary portions through the additional fitting process described in the next section. We use a combined measure based on the common factor score (*EQ*) obtained from a factor analysis of three common earnings quality measures: accruals quality (*AQ*), absolute abnormal accruals (*AbsAA*), earnings variability (*EarnVar*).[11] Exact definitions for all variables are listed in Appendix A. Higher values of *AQ*, *AbsAA*, and of *EarnVar* indicate poorer earnings quality.[12] 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 et al. 2010), the common factor is (hopefully) a very general statistical measure of earnings quality.

3.2 Measuring innate and discretionary earnings quality

We distinguish between variation in earnings quality driven by business fundamentals and variation driven by managerial incentives, by fitting *EQ* directly on a set of variables capturing firm fundamentals and a set of variables capturing managerial incentives:

$$EQ_{it} = \boldsymbol{x}'_{it}\boldsymbol{\alpha} + \boldsymbol{z}'_{it}\boldsymbol{\beta} + e_{it} \quad (1)$$

where *EQ* is our earnings quality measure, $\boldsymbol{x_{it}}$ is a vector of the innate variables, $\boldsymbol{z_{it}}$ is a vector of variables proxying for managerial incentives, and e_{it} is the error term. The fitted value of *EQ* on the vector of innate variables in equation (1) is the measure of innate earnings quality (*InnateEQ*),

[11] Accruals quality, *AQ*, is based on the Dechow and Dichev (2002) model, as extended by McNichols (2002), which measures over-time volatility in 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 et al. 2004, Dichev and Tang 2008, 2009). We define earnings as earnings before extraordinary items, scaled by total assets.

[12] We use the terms "poor" and "good" earnings quality to remain consistent with (most) 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 varies across studies.

i.e., variation in earnings quality associated with the firm's business model and operating environment. The fitted value of *EQ* on the vector of managerial incentive variables in Equation (1) is the measure of discretionary earnings quality (*DiscEQ*), i.e., variation in earnings quality associated with managerial incentives. The residuals of equation (1) represent noise.

For the vector of innate variables, we follow the set of firm fundamentals identified in Dechow and Dichev (2002) and Francis et al. (2004, 2005): *firm size, cash flow variability, sales variability, length of operating cycle, incidence of negative earnings realizations, intangibles intensity,* and *capital intensity*. For the vector of managerial incentive variables we use incentives discussed and identified in the survey article about accounting choice by Fields et al. (2001), who in turn draw from the theoretical foundations of accounting choice (e.g., Modigliani and Miller 1958, Watts and Zimmerman 1986). Fields et al. sort incentives into three categories: contractual arrangements, asset pricing considerations, and influencing external parties. We operationalize these incentives using fourteen variables: *compensation*, *proximity to financial default* (using the Merton 1974 distance to default model), *equity offerings, shares for shares acquisitions, debt issues, meeting analyst forecasts, reporting earnings increases, reporting profits, firm listing age, growth, negative stock returns, tax considerations, competition*, and *public visibility*. For each incentive variable we follow prior empirical literature that has examined the related earnings management incentive.

Appendix B provides detailed definition all variables, a cross reference to relevant empirical literature for each variable, and shows how the earnings quality measure, *EQ*, loads on innate factors and on managerial incentives.[13] The innate factors and managerial incentives explain 53.25% of the variation in *EQ*.[14] Six of the innate factors are significant at conventional

[13] Results of our empirical implementations are robust to additional specifications of *EQ* that include alternative measures of incentive variables especially with regards to compensation incentives (for details see Appendix B).

[14] When repeating equation (1) for the individual earnings quality measures, *AQ*, *EarnVar* and *AbsAA*, results are qualitatively similar for all measures, except that the explanatory power is somewhat weaker for *AQ* (R^2=36.65%) and substantially weaker for *AbsAA* (R^2=12.61%). We also repeat equation (1) 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 innate variation attributed to operating performance. Innate factors and incentive

levels in the expected direction. Eight of the incentive variables are significant at the 10% level or better and in the expected direction. To the extent the identification of innate factors and managerial incentives affecting earnings quality is reasonably complete, the structure of equation (1) offers two potential benefits for our investigation. First, it offers measures for both innate and discretionary earnings quality. Second, unlike residual-based measures of managerial discretion such as the many implementations of the Jones (1991) model or the discretionary accruals quality measure in Francis et al. (2005), it separates out noise in earnings that is unrelated to managerial incentives and often reduces the power of tests. The downside risk is misclassification between innate and discretionary variables. For example, being close to financial distress may cause inherent uncertainty in accruals estimation, and may therefore capture volatility in earnings properties not necessarily driven by managerial intent. We probe the construct validity of *InnateEQ* and *DiscEQ* using three construct validity tests as reported in Section 4.2.

3.3 Corporate governance variables

There are a large number of governance variables in the literature. Since the motivation for this study comes from both strands of the corporate governance literature (investigations of the effect of governance on discretionary earnings quality and investigations of the effect of innate quality on governance structures), our decision rule has been to include governance variables common to both types of studies. In individual cases, prior literature disagrees whether a particular variable captures "good" or "bad" governance. For example, having insiders that own non-trivial equity stakes in the firm aligns their interests with those of shareholders generally, but a high level of insider ownership can indicate managerial entrenchment. For governance variables where there is such disagreement, we review different interpretations in the

variables combined explain 12.15% of the variation in *AbsPAAA*. For all earnings quality measures, including the ones originally designed to isolate managerial discretion, the innate variables dominate the incentive variables in terms of explanatory power. Thus, traditional measures of discretionary earnings quality are all more strongly related to business fundamentals than they are to incentive variables identified in prior literature. Owens et al. (2015) similarly comment on the fact that abnormal accruals measures are strongly influenced by business model characteristics. We also repeat equation (1) excluding incentive variables that are not significant in the expected direction in Table A (Appendix B), i.e. *PosΔEarn, PosEarn, NegRet* and *S&PMember*. Empirical results in the corporate governance tests are similar, both in terms of magnitudes and statistical significance.

literature as we present results and employ additional tests. Regardless of the interpretation of a particular variable, however, our main hypothesis is that it has different-sign association with discretionary and innate earnings quality, respectively.

Our starting point is the literature examining the information-based attributes that shape corporate governance structures (Bushman et al. 2004, Coles et al. 2008, Linck et al. 2008, Ferreira et al. 2011). A central theme in this literature is the corporate board structure with an emphasis on board efficiency, independence and expertise. The first variable captures the size of the board. Prior literature suggests a non-linear association with firm performance, with smaller or larger boards being better, depending on firm's need for the monitoring role of the board (smaller boards can be more cohesive and effective monitors) versus the advisory role of the board (larger boards can offer better advice). Empirically, the trade-off is linked to firm size; for example, Linck et al. (2008, p.316) show that board size varies considerably across small, medium and large firms. Consequently, we employ a relative measure of board size, *BoardSize*, using firm size groups as the benchmark. We form size groups by ranking sample firms into quartiles based on total assets each year. *BoardSize* measures the absolute value of the deviation between the company's board size and the average board size of the firm size group. We expect *BoardSize* to act as a monitoring variable, and we multiply the deviation by –1 to ensure consistency with the ordering of other monitoring variables.

Following several studies (e.g. Beasley 1996 and Klein 2002), we use the proportion of outside directors, *OutsideDirectors*, as a proxy for board independence. As pointed out by Klein (2002), several studies suggest a link between independence and firm performance. As for financial reporting outcomes, Dechow et al. (1996) and Beasley (1996), among others, document a negative association between the proportion of outside directors and earnings manipulation. Consequently, we expect *OutsideDirectors* to work as a monitoring variable.

To capture board expertise we use outside director industry expertise (*DirectorExpertise*). To measure expertise, we count outside directors' years of industry-specific experience, using the

Fama and French (1997) industry classification. We code outside directors as experts if they have had at least five years of experience as a director in the industry. *DirectorExpertise* is the proportion of expert outside directors on the board. We expect *DirectorExpertise* to work as a monitoring variable.

Stock ownership by inside directors affects their interest alignment with outside shareholders. To capture the effects of inside directors' ownership, we include the average percentage of shares held by inside directors (*InsiderOwnershipPct*) and the average value of shares held by inside directors (*InsiderOwnershipVal*). Following Bushman et al. (2004), *InsiderOwnership* is a composite variable capturing the average within sample and year percentile of *InsiderOwnershipPct* and *InsiderOwnershipVal*. Cheng and Warfield (2005) provide 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. Larcker et al. (2007) document a positive association between measures an insider power composite, that includes insider ownership, and the likelihood of accounting restatements. Warfield et al. (1995), also acknowledge the entrenchment effect, but find that managerial ownership can be beneficial for earnings quality at low levels of managerial ownership. While over the full sample we expect *InsiderOwnership* to work primarily as an entrenchment variable, we perform additional tests for varying levels of managerial ownership.

Finally, we consider the role of concentration of stock ownership by outside shareholders. Similar to Bushman et al. (2004), we capture shareholder concentration by combining information on the value of shares held by outside shareholders, the dispersion in the number of shareholders, and the existence and presence of institutional shareholders. *ShareholderConcentration* is a composite variable representing the average within-sample and year percentile of *OutOwnVal*, *OwnConc*, *InstOwn* and *BlockInstOwn*. *OwnVal* is the market value of common stock minus the value of stock held by inside directors all divided by the number of shareholders. *OwnConc* is 1 divided by the number of common shareholders. *InstOwn*

is the percentage of stock held by institutions and *BlockInstOwn* is the percentage of stock held by institutions owning more than 5% of the firm's shares. The economics literature has long discussed both positive effects of concentrated ownership and negative effects due to agency costs, etc. In a cross-country setting, Leuz et al. (2003) conclude that ownership concentration leads to more earnings management. Based on these findings, we (cautiously) expect *ShareholderConcentration* to work similar to an entrenchment variable. That is, we expect the negative effects of concentrated ownership to outweigh the positive effects, but we are mindful of the fact that there are arguments for both.

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, mergers and acquisition data from SDC Platinum, and analyst forecast data from I/B/E/S. 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. Executive compensation data are available for the firms in the S&P 1500 Index (active, inactive, current and previous members) from 1992 and onwards. Our sample before requiring corporate governance data is 13,741 observations for 1,823 distinct firms for fiscal years 1992-2009.[15] We obtain board and insider ownership data from Risk Metrics (data availability from 1996 onwards) and institutional ownership data from Thomson Reuters. The final sample has 9,496 observations for 1,511 firms over the fiscal years 1996-2009.

Panel A of Table 1 contains descriptive statistics for the earnings quality measures. 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*, 0.035 [0.029] is slightly lower than Francis et al. (2005), who

[15] Because of variable construction, this requires data up until 2011.

report 0.044 [0.031] for their sample of firms, which is unconstrained by requirements about I/B/E/S, ExecuComp, Risk Metrics, and Thomson Reuters coverage. The comparison is consistent with our firms being larger and more stable because of sample requirements (with correspondingly better earnings quality). For example, the mean (median) size, defined as log of total assets, in our sample is 7.677, (7.541); Francis et al. report 4.805 (4.625). All earnings quality metrics in our sample exhibit a substantial standard deviation compared to the mean, however, indicating that meaningful cross-sectional variation exists.[16]

The corporate governance variables in our sample also display non-trivial cross-sectional variation. Because samples are so different in the empirical governance literature, comparisons across studies are perhaps less meaningful. For example, Bushman et al. (2004) study Fortune 1000 firms in 1994, Bowen et al. (2008) study firm-years on Excecucomp 1992-1995, Ferreira et al. (2011) study IRRC firms 1990-2001. Such sample differences notwithstanding, our sample seems reasonably comparable in terms of descriptive statistics. For example, our mean (median) proportion of independent directors is 69.6% (72.7%). Ferreira et al. report 75.3% (77.8%), and Bushman et al. report 78% (80%). Our average (median) number of directors is 9.6 (8.0), Ferreira et al. report 9.8 (10.0), Bushman et al. report 11.2 (11.0).

Panel B of Table 1 shows the correlation between the four earnings quality measures. *EQ*, the common factor of *AQ*, *EarnVar*, and *AbsAA*, is highly correlated with all three components (50% or higher in both Pearson and Spearman correlation), indicating that all three measures are meaningfully related to the common factor.

4.2 Innate and discretionary earnings quality measures – construct validity

Before proceeding to the main tests, we perform construct validity tests for our innate and discretionary earnings quality measures.

[16] 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 slightly more stringent than ours, report an average *AQ* of 0.028 (we report 0.035) with a standard deviation of 0.025 (we report 0.023).

4.2.1 A test based on the Sarbanes-Oxley legislation

Our first test is based on a regulatory event affecting all firms but with differential expected effects on innate and discretionary earnings quality. An implication of the linkages between innate and discretionary earnings quality is that exogenous shocks to business fundamentals would affect both innate and discretionary earnings quality, whereas shocks to reporting discretion should affect discretionary earnings quality but leave innate earnings quality largely unaffected.[17] The passage of the Sarbanes-Oxley legislation (SOX) in 2002 is an example of the latter, because its aim was to partially restrict managerial discretion in financial reporting and disclosure choices to restore investors' confidence in the integrity of external financial reporting.[18] Consequently we predict better discretionary earnings quality in the post-SOX period, because the cost of aggressive accounting choices is higher in expectation, and we predict no effect on innate earnings quality. Cohen et al. (2008) offer two explanations for the higher cost of aggressive accrual choices in the post-SOX period: more scrutiny of accrual choices by auditors and regulators after the passage of SOX, and more severe sanctions facing managers if accused of questionable or fraudulent reporting practices. SOX is also an interesting setting for an additional reason. While there is disagreement in the literature on the interpretation of certain individual corporate governance variables, we believe that the predictions for this governance-related regulatory event are (more) unambiguous.

To test these predictions, similar to Cohen et al. (2008), we regress the earnings quality proxies on a time trend and an indicator of the post-SOX period:

$$DiscEQ_{j,t} = a_0 + a_1 Time_{j,t} + a_2 SOX_{j,t} + e_{j,t} \quad (2a)$$

$$InnateEQ_{j,t} = a_0 + a_1 Time_{j,t} + a_2 SOX_{j,t} + e_{j,t} \quad (2b),$$

[17] While one cannot rule out that at least some firms would make business model changes because of financial reporting outcome considerations, we believe such changes are relatively less likely because of their costliness, and substantial business model changes would also take multiple years to effect.

[18] By exogenous, we mean exogenous relative to the individual firm and its management. Obviously, there were forces that triggered increased financial regulation such as SOX at the time (including, but not limited to, perceived aggregate corporate financial reporting behavior).

where *Time* is a trend variable equal to the difference between the current year and 1996, and *SOX* is a dummy variable for reporting periods after 2002. We expect the coefficient on *SOX*, α_2, to be zero for *InnateEQ* (indicating no change), and negative for *DiscEQ* (indicating an improvement in discretionary earnings quality). We remove observations of accounting periods ending in 2002 in this test.

Panel A of Table 2 reports the results. As expected, the *SOX* coefficient for *DiscEQ* is significantly negative (−0.036, t=−3.83), and the SOX coefficient for *InnateEQ* is close to zero (0.005, t=0.19). The *Time* coefficient for *DiscEQ* is significantly positive (0.003, t=3.13), consistent with the general deterioration in discretionary earnings quality over time (e.g., Rajgopal and Venkatachalam 2011). As a sensitivity test (not tabulated) we omit the *Time* trend from equation (2a); the *SOX* coefficient remains significant, albeit with a lower t-statistic (t=−2.09). The *Time* coefficient for *InnateEQ* is zero (0.000, t=0.02), consistent with firms' fundamentals and the associated innate earnings quality on average being stable over time, which we believe lends further support to the construct validity of our separation of earnings quality into its innate and discretionary portions. As a sensitivity test, we also add *InnateEQ* as a control variable in the test of the SOX effect on *DiscEQ* (equation 2a). The results, which are reported in the last column of Panel A in Table 2, indicate that the explanatory power is greatly increased, but the *SOX* coefficient for *DiscEQ* remains unaffected (−0.036, t=−4.42). We view these results as supporting the construct validity of the discretionary and innate earnings quality measures.

4.2.2 Accounting restatements

Our next test involves accounting restatements. Restatements include both errors (unintentional misstatements) and irregularities (intentional misstatements). Distinguishing between errors and irregularities is important if the purpose of the test is to detect aggressive accounting choices (Palmrose et al. 2004, Hennes et al. 2008). The distinction is also useful for the identification of innate and discretionary earnings quality. We expect firms dealing with innate earnings quality issues to be prone to making accounting errors. We expect firms with

issues in reported earnings due to managerial incentives and intent to be concentrated within the irregularities sample. Consequently, we expect poor innate earnings quality to be associated with errors, and poor discretionary earnings quality to be associated only with irregularities.

We collect data on restatements from Audit Analytics. The database covers all SEC registrants that have disclosed a financial statement restatement in the regulatory filings (8K, 10K, 10Q, 20F, 40F). The database identifies cases of irregularities (restatements classified as fraud, irregularities and misrepresentations) by searching for the reasons of the restatement within audit opinions. This is consistent with the identification approach followed by prior research (Hennes et al. 2008). We conduct separate logit regressions for the misstatements caused by irregularities (*Irreg*=1), and remaining misstatements (*Errors*=1). The model includes our two earnings quality measures, *InnateEQ* and *DiscEQ*, and other determinants of accounting restatements (firm size, financial leverage, operating performance, the book-to-market ratio, sales growth and sales volatility; Srivivasan et al. 2015). We expect the coefficient *DiscEQ* to be positive only for irregularities while that on *InnateEQ* to be positive for errors.

Over our sample period we count 43 restatements being classified as fraud, irregularities and misrepresentations (*Irreg*=1), and 867 as remaining cases (*Errors*=1). Panel B of Table 2 presents the results. In the first column we model just irregularities (*Irreg*=1). As expected, the coefficient on *DiscEQ* is significantly positive (4.953, t=2.72), consistent with irregularities being associated with poor discretionary earnings quality. The coefficient on *InnateEQ* is insignificant (−0.318, t = −0.29). When modelling remaining restatements (*Errors*=1) in the next column, it is only the coefficient on *InnateEQ* that is significantly positive (0.881, t=2.16), consistent with errors being associated mainly with poor innate earnings quality. We view these results as lending further support to the construct validity of the innate and discretionary earnings quality measures.

4.2.3 Over-time changes

As an additional validity test of innate and discretionary earnings quality measures, we also investigate over-time changes in each measure. We expect *InnateEQ* to be relatively more stable over time compared to *DiscEQ*, since *InnateEQ* represents earnings quality tied to the business model, which is unlikely to change majorly from year to year. *DiscEQ* is, we believe, more likely (in a relative sense) to change as incentives can change from year to year. Note that *EQ* itself is relatively stable by design (estimated over a seven year period). So the question is whether the year-by-year fitting process on fundamental variables versus incentive variables makes *InnateEQ* more stable than *DiscrEQ*.

We examine the percentage year-to-year absolute change in *InnateEQ* and *DiscEQ* on the firm level. Using a paired-sample test of these changes, we find that the mean/median firm level year-on-year absolute change in *DiscEQ* (172%/50.1%) is significantly larger than the mean/median change in *InnateEQ* (36.5%/16.3%). We view this result as supportive of our method of identifying innate and discretionary earnings quality.

4.3 Earnings quality and corporate governance

In this section we report results of tests on relations between firm-specific governance variables and discretionary and innate earnings quality, respectively.

4.3.1 Preliminaries

In a preliminary test with firm-specific corporate governance measurement we construct a composite corporate governance variable, *CG*, obtained from a factor analysis of *BoardSize*, *OutsideDirectors*, *DirectorExpertise*, *InsiderOwnership*, and *ShareholderConcentration*. We are mindful of arguments in the literature that empirical corporate governance variables capture different dimensions, which begs the question whether they can be meaningfully combined into a single composite or index (e.g., Larcker et al. 2007, Brickley and Zimmerman 2010). Such arguments notwithstanding, we believe a basic test on a combined corporate governance measure is useful to set the stage for the more detailed tests that follow.

Panel A of Table 3 provides the Pearson (above the diagonal) and Spearman (below the diagonal) correlations among the individual corporate governance variables as well as the *CG* composite variable. Among the individual variables, most correlations are economically meaningful (an absolute value of about ten percent or higher), except for *BoardSize* which has a low correlation with all other variables except *OutsideDirectors*. Statistically, all correlations except for the correlations between *BoardSize* and *ShareholderConcentration* are significant at the 1% level or better (not tabulated). Sign-wise, *BoardSize*, *OutsideDirectors* and *DirectorExeprtise* are positively correlated with each other and negatively correlated with *InsiderOwnership* and *ShareholderConcentration* (with the exception of the insignificant correlation between *BoardSize* and *ShareholderConcentration*). *InsiderOwnership* and *ShareholderConcentration* are in turn are positively correlated with each other. To the extent, therefore, that each variable captures (at least some) valid dimension of governance, *BoardSize*, *OutsideDirectors* and *DirectorExpertise* behave like straight governance variables, whereas *InsiderOwnership* and *ShareholderConcentration* are inverse indicators, i.e., they behave like entrenchment variables.

The correlations between the corporate governance composite variable, *CG*, and the individual governance variables reinforce the individual correlations. *CG* is strongly positively associated with *BoardSize*, *OutsideDirectors* and *DirectorExeprtise* (correlations range from 23.3% to 83.2%) and strongly negatively associated with *InsiderOwnership* and *ShareholderConcentration* (correlations range from −41.4% to −62.0%). The high absolute correlations with all variables indicate that *CG* includes dimensions from all five individual variables. The associations also imply that the *CG* variable is ordered such that a higher value means stricter governance.

Panel B of Table 3 includes an initial test of our basic hypothesis that innate and discretionary earnings quality have opposite-sign associations with corporate governance in a simple design that is held constant for both innate and discretionary quality. Specifically, we

regress *CG* on *InnateEQ* and *DiscEQ* controlling, in this parsimonious specification, only for firm size, because governance is strongly related to firm size and *InnateEQ* is mechanically related to firm size through the fitting process. Recall that we view *InnateEQ* as an ex ante proxy for the scope for moral hazard, to which the firm is expected to have countervailing corporate governance structures. While we view *DiscEQ* as an outcome variable of moral hazard, it is not inconceivable that its average effect is that of an ex-post proxy of the *scope* for moral hazard, i.e., that it would have the same basic properties as *InnateEQ* rather than being constrained by governance. By including it in the same test as *InnateEQ*, we get a direct and basic test – holding the research design constant – of our hypothesis that *InnateEQ* and *DiscEQ* have opposite-sign associations with corporate governance. The results in the first column of panel B show that our basic hypothesis is borne out by the data. *CG* is positively associated with *InnateEQ* (t=2.11), indicating that governance is stronger in poor innate earnings quality environments. *CG* is negatively associated with *DiscEQ* (t=−5.51), indicating that governance is associated with better discretionary earnings quality. *Size* is, as expected, strongly positively associated with *CG*. We obtain similar results in the next column where we include further variables that affect governance, e.g. the number of years a firm has been public (*YrsListed*), the book-to-market ratio (*BM*), return on equity (*ROE*)), and indicators of firms operating in regulated industries (*Financials* and *Utilities*).[19] We view these results as providing initial support for the thesis that the association between governance and earnings quality differ predictably depending on the source of earnings quality, firm fundamentals or managerial incentives. In the sections that follow we present our main tests, with individual governance variables and an investigation of the effects of the interaction between innate and discretionary earnings quality.

4.3.2 Discretionary earnings quality and corporate governance

Table 4 contains the main analysis of the relation between earnings quality and individual governance variables. We start with how corporate governance associates with discretionary

[19] We follow Bushman et al. 2004, Linck et al 2008, Ferreira et al. 2011 in choosing control variables.

earnings quality either unconditional or conditional on the degree of underlying uncertainty as proxied by innate earnings quality. The basic model of *DiscEQ* on the five governance variables is:

$$\begin{aligned} DiscEQ_{i,t} = {} & a_0 + a_1 BoardSize_{i,t} + a_2 OutsideDirectors_{i,t} + a_3 DirectorExpertise_{i,t} \\ & + a_4 InsiderOwnerhip_{i,t} + a_5 ShareholderConcentration_{i,t} \\ & + [controls] + e_{i,t} \end{aligned} \quad (3)$$

We retain this basic specification to enhance comparability with prior studies and perform additional analysis in Section 4.3.4 (Table 6) to account for the potentially endogenous nature of corporate governance mechanisms. The first column of Panel A (equation 3 without controls) shows significant results in the expected direction for all governance variables, *DirectorExpertise* (t=−4.60), *OutsideDirectors* (t=−1.72), *BoardSize* (t=−2.28), *InsiderOwnership* (3.83), and *ShareholderConcentration* (t=11.49).[20] The R^2 is 0.1207. The second and third columns in Panel A of Table 4 introduce innate earnings quality (second column) and innate earnings quality and firm size (third column) as additional independent variables. The explanatory power increases substantially (R^2=0.2735 and R^2=0.2950 respectively). Four out of the five governance variables remain significant at conventional levels. *OutsideDirectors* is now no longer reliably associated with *DiscEQ*. Discretionary earnings quality thus improves with optimal board size and directors' industry expertise (and outside directors, but not with controls), and it worsens with insider ownership and ownership concentration.

Panels B and C of Table 4 explores the interaction between innate earnings quality (our proxy for the scope for moral hazard) and corporate governance when investigating the governance effects on discretionary quality. Following the reasoning in Demsetz and Lehn (1985) the scope for moral hazard is greater in more volatile environments, which are also

[20] Warfield et al. (1995) acknowledge the entrenchment effect of insider ownership, but they also find that managerial ownership can even be beneficial for earnings quality at low levels of managerial ownership. To test for this (not tabulated), we split up *InsiderOwnership* into three equal-sized groups: low, medium and high insider ownership. We find that *InsiderOwnership* continues to behave as an entrenchment variable for medium and high insider ownership, whereas there is no effect in the low insider ownership group.

characterized by poorer innate earnings quality and should have an impact on the effectiveness of corporate governance mechanisms. Because we expect firms to have more effective governance structures when innate quality is poor, we expect the effect of corporate governance on discretionary quality to be more pronounced when the underlying innate quality is poor.

To test this assertion, we construct a quartile-ranked variable, *InnateEQ*(*Q*), with innate earnings quality worsening as we move from the first to the fourth quartile. Panel B contains preliminary evidence. We repeat the main test from Panel A (that is, equation 3 above) for each of the four *InnateEQ*(*Q*) quartiles. We expect the discretionary earnings quality effect of monitoring variables to be more pronounced when innate quality is poor and the effect of entrenchment to be less pronounced. Since *DiscEQ* is ordered such that high values indicate poor quality, this means that we expect increasingly negative coefficients for monitoring variables (*BoardSize, OutsideDirectors, DirectorExpertise*) and less positive coefficients for entrenchment variables (*InsiderOwnership, ShareholderConcentration*), as we move from the first to the fourth *InnateEQ*(*Q*) quartile. So we expect the difference in coefficient estimates between the fourth and the first quartile to be negative for all variables. This is indeed the case for *DirectorExpertise, BoardSize*, *InsiderOwnership* and *ShareholderConcentration* (significant difference at the 1% level or better). We see monotonically decreasing coefficient estimates across quartiles for *DirectorExpertise*, for *ShareholderConcentration*, and (weakly) for *BoardSize*. The coefficient difference for *OutsideDirectors* is insignificant (consistent with the insignificant result for *OutsideDirectors* in Panel A when controlling for *InnateEQ*).

In Panel C, we conduct a more formal test of interaction effects by interacting *InnateEQ*(*Q*) with each of the corporate governance variables. We show results with and without firm size as a control. Consistent with our hypothesis, the interaction effects are significantly negative for all variables except *OutsideDirectors* (similar to Panel B).[21] This means that as *InnateEQ* worsens (indicating a more volatile business and operating environment), the effect on

[21] Results are not sensitive to whether we rank by quartiles, quintiles or deciles.

discretionary earnings quality of monitoring variables such as *BoardSize* and *DirectorExpertise* is more pronounced, and the deteriorating effect of entrenchment (*InsiderOwnership* and *ShareholderConcentration*) is less pronounced (t-statistics on the four interaction variables range from –1.83 to –3.02 in the two specifications).

We next probe the rationale for the interaction effects by directly testing how corporate governance variables are associated with the underlying innate earnings quality. Specifically, we test how *InnateEQ* performs in predicting corporate governance structures, controlling for other characteristics of the company's business environment that affect governance.

$$CGI_{i,t} = a_0 + a_1 InnateEQ_{i,t} + a_2 DiscEQ_{i,t} + [controls] + e_{i,t} \quad (4)$$

where *CGI* represents one of the five direct or inverse corporate governance indicators from before: *BoardSize, OutsideDirectors, DirectorExpertise, InsiderOwnership,* or *Shareholder-Concentration*. With *InnateEQ* being our proxy for the scope for the moral hazard, we expect that it would be positively associated with monitoring variables (*BoardSize*, *OutsideDirectors*, and *DirectorExpertise*) and, to the extent that they mainly proxy for entrenchment, *Insider-Ownership* and *ShareholderConcentration* should have negative associations with *InnateEQ*.

Table 4 panel D reports the regression results of corporate governance structures on innate earnings quality. Two of the three board monitoring variables *DirectorExpertise* and *OutsideDirectors*, are positively associated with *InnateEQ* as expected. *BoardSize* is insignificant.[22] Also as expected, *InsiderOwnership* is negatively associated with *InnateEQ*. *ShareholderConcentration* is positively associated with *InnateEQ*. While this is consistent with *ShareholderConcentration* behaving as a monitoring variable, as in Bushman et al. (2004), it is inconsistent with how it behaves in terms of correlations with other monitoring ad entrenchment variables (see Panel A of Table 3). Because of this inconsistent result, we also test equation 4 with a measure directly designed to capture entrenchment, Bebchuk et al.'s (2009) entrenchment

[22] While we expect all three variables to be significantly related to *InnateEQ*, we note that Linck et al. (2008) argue that information structures may have differential effects on various board structures.

index. We find a significant negative association between this entrenchment index and *InnateEQ* (t-statistic of −2.12, not tabulated), thus confirming that poor innate earnings quality is associated with governance structures expected to lead to lower entrenchment.[23] Finally, discretionary earnings quality, while present in this test primarily as a control variable, continues to exhibit the predicted association all governance indicators other than *OutsideDirectors*.[24]

On balance, we view the results in Table 4 as being consistent with our main hypotheses for discretionary earnings quality, innate earnings quality and corporate governance. Corporate governance structures appear to respond to innate earnings quality as a proxy for the scope for the moral hazard. Variables capturing stronger monitoring are associated with better discretionary earnings quality and variables proxying for entrenchment are associated with poorer discretionary earnings quality. Finally, the effects of monitoring (entrenchment) on discretionary earnings quality are stronger (weaker) when innate quality is poor.

4.3.3 A single model of earnings quality

We have developed a research design to fit the research objective of highlighting the two underlying forces shaping earnings quality and their implications for the earnings quality-corporate governance association. The design therefore involves two stages: the first extracting explicit measures of innate and discretionary earnings quality, and the second testing the association of each measure with corporate governance variables. To the extent, however, that a research focus remains solely on how governance shapes (discretionary) earnings quality, a common alternative approach to constructing a specific measure of discretionary earnings quality is to regress a general earnings quality measure on corporate governance variables and adding innate factors as explicit controls for business fundamentals. We believe this approach suffers

[23] The downside to using the Bebchuk et al. (2009) entrenchment index is substantial sample loss. Our sample is reduced by roughly half, to 4,737 observations, which is why we do not use the index in the main tests (the index can be downloaded from http://www.law. harvard.edu/faculty/bebchuk/data.shtml). 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.

[24] This result is due to the inclusion of firm size as a control variable (this inclusion also affects the loading of outside directors in Panel A). We speculate that this is due to firm size being correlated with few incentive variables used to construct *DiscEQ*.

from two potential shortcomings. First, the dependent variable still includes measurement error, and, second, the inferences are affected by collinearity among innate factors and corporate governance structures.

To explore the severity of these issues, we follow this single model approach and report results in Table 5. We repeat equation (3) this time using *EQ* as the dependent variable and extend the specification to include all innate factors identified in equation (1). The first column of Table 5 reports the regression results. The explanatory power of this specification is reasonably high, R^2=0.4771, reflecting the substantial explanatory power of innate factors for earnings quality. Unlike the main results in Table 4, however, none of the governance variables is significant in the expected direction. To investigate whether this result is due to measurement error in the *EQ c*onstruct, we repeat the analysis this time adding the residuals of equation (1) in the specification, which are our proxy for noise in the *EQ* construct, i.e. variation in the construct unrelated to business fundamentals and managerial incentive variables. The second column of Table 5 reports the regression results. The explanatory power of this specification increases to 0.9861, reflecting the additional variation attributed to noise — the error term captures roughly 46% of the variation in *EQ* in model 1 –see Appedix B). Once we control for noise, four out of the five governance variables load significantly in the predicted direction, board size, director expertise, insider ownership and shareholder concentration. We view this result as indicative of the noise reduction effect of our methodology when measuring corporate governance effects on financial reporting quality.

In summary, results in Table 5 suggest that a potential (partial) explanation for mixed and sometimes inconsistent results in the literature that has examined the association between corporate governance and earnings quality is measurement error in the earnings quality constructs.

4.3.4 Endogeneity of corporate governance and reverse causality

In our setting, both governance and discretionary earnings quality are endogenous. With respect to earnings quality, we take endogeneity into account in the definitions and constructs of our measures for innate and discretionary earnings quality. With respect to corporate governance we have reported basic specifications thus far to keep largely in line with prior literature. In this section we perform additional tests to address the endogeneity of corporate governance to mitigate any remaining concerns over omitted correlated variables. Such tests also mitigate concerns over reverse causality, i.e. the possibility that discretionary earnings quality proxies for the scope instead of the outcome of the moral hazard, although results so far are inconsistent with such a prediction (that is, the average effect of *DiscEQ* is that of an outcome variable, i.e. constrained by governance, rather than an ex-post proxy of the scope for moral hazard).

One way to address endogeneity concerns is to use lagged explanatory variables (e.g., Ferreira et al. 2011). We repeat equation (3) using lagged corporate governance structures as explanatory variables. The results (not tabulated) show that all five governance variables remain significant in the expected direction, confirming the predicted association between discretionary earnings quality and corporate governance.

Another way to address endogeneity issues is through firm fixed effects. Firm fixed effects estimation controls for unobserved time-invariant factors that simultaneously determine corporate governance structures and discretionary earnings quality. The downside is that if governance variables are relatively sticky, i.e., if they do not change much over time, the method has low power. This limitation notwithstanding, firm fixed effects estimation is equivalent to looking only at within-firm changes of corporate governance, and as such may offer additional insights on how such changes may affect earnings quality. Columns 1 and 2 of Table 6 present firm fixed effects estimates of equation (3) (with t-statistics adjusted for firm-level clustering), controlling only for size (column 1) or further time variant determinants (column 2). We find that all three monitoring variables (*DirectorExpertise*, *BoardSize*, and *OutsideDirectors*) are significant at the 5% level or better in the expected direction, but the entrenchment variables lose

significance. These results suggest that changes in board structure are significant in predicting changes in discretionary earnings quality. The next two columns shed further light on this effect, through the interaction terms specification with innate earnings quality. The interaction effects are significantly negative for all board monitoring variables at the 1% level or better, suggesting that within-firm changes in board structure that enhance monitoring are more effective (in improving discretionary earnings quality) when firms face issues in innate earnings quality.

On balance, we believe these analyses mitigate concerns that main results are driven by remaining endogeneity concerns over corporate governance. They also lend further support to the average effect of *DiscEQ* being that of an outcome variable constrained by changes in corporate governance, especially within volatile business environments.

4.3.5 Alternative measures of discretionary earnings quality

We next probe our theoretical framework, and the implications thereof, using traditional measures of earnings quality used in prior research. For these tests we use the basic specifications to enhance comparisons of performance across measures. Table 7 reports the regression results. For ease of reference, we repeat our main result from Panel A of Table 4 in the first column. The second column of Table 7 Panel A uses signed abnormal accruals based on the modified Jones (1991) model (*AA*), as in Xie et al. (2003) and Larcker et al. (2007). In this model all of the governance indices are insignificant and the adjusted R2 of the model is low, 0.11%, compared to 12.07% for our measure. The next measure is absolute abnormal accruals, *AbsAA* (e.g., Klein 2002, Larcker et al. 2007). In this model all variables, other than *BoardSize*, are significant in the expected direction, yet the explanatory power remains low (1.98%). Using absolute performance adjusted abnormal accruals (*AbsPAAA*; Kothari et al. 2005) yields similar results: *BoardSize* remains insignificant and the explanatory power is low (2.17%), but the other variables are significant at conventional levels.[25] The next column contains the results when

[25] We also note that when including firm fixed effects *AbsAA* and *AbsPAAA* do not retain the predicted associations with any of the board structure variables.

using *ResDEQ*, which is the discretionary earnings quality measure in Francis et al. (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; however, the set of business fundamentals is greatly expanded and includes variables that may work as incentives for earnings management. Also in the case of *ResDEQ* the explanatory power is low (0.19%), and none of the governance variables is significant in the predicted direction. This result indicates that orthogonalizing with respect to a larger set of fundamental variables can remove much of the variation in earnings quality associated with incentives for poor earnings quality, such as earnings management.

We next consider some further earnings quality metrics common in prior research. The next column of Panel A of Table 7 uses a smoothing ratio, *Smoothness*, based on the standard deviation of operating cash flows divided by the standard deviation of earnings as in Pincus and Rajgopal (2002), Leuz et al. (2003), Jayaraman (2008), and Dechow et al. (2010). This measure is also affected by accrual choices, yet centers on smoothness instead of the level of reported earnings. In the *Smoothness* model, only one out of the five governance variables is significant in the predicted direction and the adjusted R^2 of the model is low, 0.82%. When redefining smoothness to focus on firms reporting excess values of the smoothness ratio, *Smoothing*, as in Bowen et al. (2008), two additional governance mechanisms become significant in the expected direction, yet the explanatory power of the model remains low (the adjusted R^2 is 0.85%). The next measure captures the frequency of reporting consecutive small positive earnings surprises, *Freq*, based on evidence that managers use accounting discretion to avoid negative earnings surprises (Burgstahler and Dichev 1997, Degeorge et al. 1999, Matsumoto 2002). This measure also focuses on an earnings pattern, but does not imply accruals as an explicit mechanism of accounting discretion. *Freq* captures the frequency of small positive prior quarterly earnings surprises over the last 12 quarters as in Leuz et al. (2003) and Bowen et al. (2008). In the *Freq* regression none of the governance variables is significant in the predicted direction with three out

of the five governance variables actually exhibiting opposite associations. This result suggests that *Freq* may primarily reflect business environment stability and therefore a lower need for monitoring. As such, this result echoes the concern raised by Dechow et al. (2010) that common measures of earnings quality in prior research are driven to a non-trivial extent by the business in which the firm operates. In the final column we use an index of accounting discretion, *ADIndex*, that combines the measures of *AbsAA*, *Smoothing*, and *Freq* to allow for trade-offs among different types of discretion. As with *Smoothness*, only one governance variable in the predicted direction with *ADIndex.*

In sum, results in Panel A of Table 7 show that many traditional measures of earnings quality exhibit weak and sometimes inconsistent associations with governance variables (echoing the observation made by Larcker et al. 2007) . Some measures, specifically absolute abnormal accruals and absolute performance-adjusted abnormal accruals, exhibit reasonably consistent associations, but they have low explanatory power. These results suggest that a possible explanation for the mixed and sometimes inconsistent results in the earnings quality–corporate governance literature is insufficient specification the type of earnings quality considered, and the use of various earnings quality measures that contain more or less of either the innate or discretionary component.

We next probe the interaction effects by testing how the associations with corporate governance exhibited by *AbsPAAA* (the best-performing out of the traditional measures of earnings quality) vary with business environment instability. We use stock return volatility (*StdRet*) to proxy for instability, similar to Demsetz and Lehn (1985), since we wish to retain this part of the analysis free from our own earnings quality measures. We add interactions between quartiles of stock return volatility, *StdRetEQ*(*Q*) and each governance variable. Panel B of Table 7 presents the results. Two of the five governance interactions (*DirectorExpertise* and *ShareholderConcentration*) are significant, albeit weakly, indicating more effective governance in more volatile business environments.

Combined, we view the evidence in Table 7 as supporting our general theoretical framework using empirical measures from prior literature (especially performance-adjusted absolute abnormal accruals), but at the same time it shows that these measures are empirically considerably weaker than our measures *DiscEq* and *InnateEQ*.

4.3.6 Potential concerns with fitted value variables

A potential issue with our methodology is that 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 certainly cannot be ruled out on theoretical grounds.

To investigate this issue empirically, we first create 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 38.22% (not tabulated). That is, *DiscEQ* appears relatively far from a summary variable for incentives since 61.78% of the variation in *CF*(*Incentives*) is unrelated to *DiscEQ*. Next, we test the links between corporate governance and the 'earnings quality-free' portion of incentives, *ResCF*(*Incentives*). We obtain the latter from the residuals of regressing *CF*(*Incentives*) on *EQ*. The first column in Panel A of Table 8 repeats the main result from Panel A of Table 4 for *DiscEQ* for ease of read. The second column reports the results when we use *ResCF*(*Incentives*) as the dependent variable. The explanatory power of the governance variables is substantially reduced compared to when *DiscEQ* is the dependent variable (0.0369 vs. 0.1207), and only three out of the five governance variables are significant in the expected direction, whereas all five are significant in the expected direction when *DiscEQ* is the dependent variable.

As our measure of innate earnings quality is also fitted on variables, a similar concern may arise about whether the corporate governance associations with *InnateEQ* are due to innate factors themselves. While it is true that equation (4) includes a number of control variables associated with firm fundamentals, e.g. firm size, book to market, listing age etc., these may not be complete. To further investigate this issue, we create a 'pure' summary variable for innate factors by forming a common factor of all innate factors, *CF*(*InnateFactors*). Next, we regress *CF*(*InnateFactors*) on *EQ* and retain the residuals *ResCF*(*InnateFactors*) as the 'earnings-quality-free' portion of innate factors. We then repeat equation (4) adding *ResCF(InnateFactors)* as an additional variable. Panel B of Table 8 reports the regression results. The coefficients on *InnateEQ* remain similar to those in Table 4 in terms of significance. The coefficients on *ResCF(InnateFators)* are mostly insignificant (only for *ShareholderConcentration* is it significant in the same direction as the coefficient on *InnateEQ*).

We conclude from the results in Table 8 that the associations between earnings quality measures and governance variables are relatively robust to the underlying linkages between governance variables and incentives as well as linkages between governance variables and innate factors.

5. Summary and conclusions

We posit that earnings quality reflects both the scope for and the outcome of the moral hazard, since it is shaped by both volatile business fundamentals and managerial intent. Earnings quality issues associated with the volatility of the business model increases the scope for moral hazard and therefore the need for better monitoring and governance. More effective monitoring, in turn, restrains hazardous outcomes and therefore earnings quality issues associated with managerial intent. As such, the expected direction of causality and the sign in the relation between earnings quality and corporate governance differ depending on whether earnings quality is primarily innate or discretionary in nature.

We test these arguments by developing a methodology to identify and measure innate and discretionary earnings quality. Our research design allows us to simultaneously examine both types of associations between earnings quality measures and governance structures, as well as interaction effects between the two. Consistent with hypotheses, we find that discretionary earnings quality improves with more effective governance structures, and that such structures exist when innate earnings quality is poor. We further show interaction effects, i.e., corporate governance structures being increasingly effective on discretionary earnings quality as innate quality worsens.

The results show the main relations between earnings quality and corporate governance, and how the complex nature of earnings quality warrants considering the source of earnings quality effects when investigating relations with corporate governance, both as a theoretical matter and in the empirical design. Earnings quality and corporate governance can act as both substitutes and complements depending on the source of earnings quality – firm fundamentals or managerial incentives. We believe this is an important insight for corporate governance research, and potentially also for other settings involving earnings quality. The analysis also highlights the role of business fundamentals in shaping the interaction between financial reporting outcomes and corporate governance.

References

Armstrong, C., Balakrishnan, K., Cohen, D., 2012. Corporate governance and the information environment: Evidence from state antitakeover laws. Journal of Accounting and Economics 53, 185–204.

Armstrong, C., Guay, W., Weber, J., 2010. The role of information and financial reporting in corporate governance and debt contracting. Journal of Accounting and Economics 50, 179–234.

Ashbaugh H., Collins, D., LaFond, R., 2006. The effects of corporate governance on firms credit ratings. Journal of Accounting and Economics 42 (1–2), 203–243.

Athanasakou, V., Strong, N., Walker, M., 2011. The market reward for achieving analyst earnings expectations: does managing expectations or earnings matter? Journal of Business Finance and Accounting 38 (1-2), 58–94.

Bartov, E., Givoly, D., Hayn, C., 2002. The rewards to meeting or beating earnings expectations. Journal of Accounting and Economics 33(2), 173–204.

Beasley, M., 1996. An empirical analysis of the relation between the board of director composition and financial statement fraud. The Accounting Review 71(4), 443–465.

Beatty, A., Chamberlain, S., Magliolo, J., 1995. Managing financial reports of commercial banks, the influence of taxes, regulatory capital, and earnings. Journal of Accounting Research 33(2), 231–261.

Bebchuk L., A. Cohen, A. Ferrell. 2009. What matters in corporate governance? Review of Financial Studies 22(2), 783–827.

Beneish, M. 1997. Detecting GAAP violation, implications for assessing earnings management among firms with extreme financial performance. Journal of Accounting Public Policy 16(3), 271–309.

Bergstresser, D., T. Philippon. 2006. CEO incentives earnings management. Journal of Financial Economics 80(3), 511–529.

Bharath, S., J. Sunder, S. Sunder. 2008. Accounting quality debt contracting. The Accounting Review 83(1), 1–28.

Boubakri, N., H. Ghouma. 2008. Managerial opportunism, cost of debt financing regulation changes, Evidence from the Sarbanes–Oxley Act adoption. Available at SSRN, http,//ssrn.com/abstract=1127351.

Bowen, R., S. Rajgopal, M. Venkatachalam. 2008. Accounting discretion, corporate governance firm performance. Contemporary Accounting Research 25 (2), 310–405.

Brickley J. J. Zimmerman. 2010. Corporate governance myths, Comments on Armstrong, Guay Weber. Journal of Accounting Economics 50, 235–245.

Burgstahler, D., Dichev, I.D., 1997. Earnings management to avoid earnings decreases and losses. Journal of Accounting and Economics 24, 99–126.

Burns, N., S. Kedia. 2006. The impact of performance-based compensation on misreporting. Journal of Financial Economics 79(1), 35–67.

Bushman, R., Chen, Q., Engel, E., Smith, A., 2004. Financial accounting information, organizational complexity corporate governance systems. Journal of Accounting Economics 37(2), 167–201.

Cahan, S., 1992. The effect of antitrust investigations on discretionary accruals, A refined test of the political-cost hypothesis. The Accounting Review 67(1), 77–95.

Chen, K., Lee, C-W., 1995. Executive bonus plans accounting trade-offs, the case of the oil gas industry, 1985–86. The Accounting Review 70(1), 91–111.

Cheng, Q., Farber, D.B., 2008. Earnings Restatements, Changes in CEO Compensation, Firm Performance. Accounting Review 83, 1217-1250.

Cheng, Q., Warfield, T., 2005. Equity incentives earnings management. The Accounting Review 80(2), 441–476.

Cohen, D., Dey, A., Lys, T., 2008. Real accrual-based earnings management in the pre- post-Sarbanes-Oxley periods. The Accounting Review 83(3), 757–787.

Cohen, D., Zarowin, P., 2010. Accrual-based real earnings management activities around seasoned equity offerings. Journal of Accounting Economics 50(1), 2–19.
Coles, J., Daniel, N., Naveen, L., 2008. Boards, does one size fit all? Journal of Financial Economics 87, 329–356.
Dechow, P., Dichev, I., 2002. The quality of accruals earnings, The role of accrual estimation errors. The Accounting Review 77 (Supplement), 35–59.
Dechow, P., Ge, W., Schrand, C., 2010. Understanding earnings quality, a review of the proxies, their determinants their consequences. Journal of Accounting Economics 50, 344–401.
Dechow, P., Sloan, R., 1991. Executive incentives the horizon problem, An empirical investigation. Journal of Accounting Economics 14(1), 51–89.
Dechow, P., Sloan, R., Sweeney, A., 1996. Causes consequences of earnings manipulation, an analysis of firms subject to enforcement actions by the SEC. Contemporary Accounting Research 13, 1–36.
DeFond, M., Jiambalvo, J., 1994. Debt covenant violation manipulation of accruals. Journal of Accounting Economics 17(1-2), 145–176.
Degeorge, F., Patel, J., Zeckhauser, R., 1999. Earnings management to exceed thresholds. Journal of Business, 72 (1), 1–33.
Demsetz, H., Lehn, K., 1985. The structure of corporate ownership, causes consequences. Journal of Political Economy 93(6), 1155–1177.
Dichev I., Skinner., 2002. Large–sample evidence on the debt covenant hypothesis. Journal of Accounting Research 40(4), 1091–1123.
Dichev I., Tang, V., 2008. Matching the changing properties of accounting earnings over the last 40 years. The Accounting Review 83(6), 1425–1460.
Dichev I., Tang, V., 2009. Earnings volatility earnings predictability. Journal of Accounting Economics 47(1-2), 160–181.
Dichev, I., Graham, J., Harvey, C., Rajgopal, S., 2013. Earnings quality, evidence from the field. Journal of Accounting Economics 56, 1–33.
Dickinson, V., 2011. Cash flow patterns as a proxy for firm life. The Accounting Review 86, 1969–1994.
Dopuch N., Holthausen, R.W., Leftwich, R.W., 1987. Predicting audit qualifications with financial and market variables. The Accounting Review 62(3), 431-454.
Duchin R., Matsusaka, J., Ozbas, O., 2010. When are outside directors effective? Journal of Financial Economics 96, 195–214.
Efendi, J., Srivastava, A., Swanson, E., 2007. Why do corporate managers misstate financial statements? The role of option compensation other factors. Journal of Financial Economics 85(3), 667–708.
Erickson, M., Wang, S., 1999. Earnings management by acquiring firms in stock for stock mergers. Journal of Accounting Economics 27(2), 149–176.
Fama, E., French, K., 1997. Industry costs of equity. Journal of Financial Economics 43(1), 53–93.
Ferreira, D., Ferreira, M., Raposo, C., 2011. Board structure price informativeness. Journal of Financial Economics 99, 523–545.
Fields, T., Lys, T., Vincent, L., 2001. Empirical research on accounting choice. Journal of Accounting Economics 31(1-3), 255–307.
Fischer, P., Louis, H., 2008. Financial reporting conflicting managerial incentives, The case of management buyouts. Management Science 54(10), 1700–1714.
Francis J., LaFond, R. Olsson, P., Schipper, K., 2005. The market pricing of accruals quality. Journal of Accounting Economics 39(2), 295–327.
Francis, J, Lafond, R., Olsson, P., Schipper, K., 2004. Costs of equity earnings attributes. The Accounting Review 79(4), 967–1010.

Francis, J., 1990. Corporate compliance with debt covenants. Journal of Accounting Research 28(2), 326–347.
Francis, J., Olsson, P., Schipper, K., 2008. Earnings quality. Foundations Trends in Accounting 1(4), 259–340.
Graham J.R., Li, S., Qiu, J., 2008. Corporate misreporting bank loan contracting. Journal of Financial Economics 89(1), 44–61.
Guenther, D., Maydew, E., Nutter, S., 1997. Financial reporting, tax costs book-tax conformity. Journal of Accounting Economics 23(3), 225–248.
Guidry F., Leone, A., Rock, S., 1999. Earnings-based bonus plans earnings management by business-unit managers. Journal of Accounting Economics 26(1-3), 113–142.
Han, J., Wang, S., 1998. Political costs earnings management of oil companies during the 1990 Persian Gulf crisis. The Accounting Review 73(1), 103–117.
Hanlon, M., Maydew, E. Shevlin, T., 2008. An unintended consequence of book-tax conformity: A loss of earnings informativeness. Journal of Accounting and Economics 46, 294-311.
Healy, P., 1985. The effect of bonus schemes on accounting decisions. Journal of Accounting Economics 7 (1-3), 85–107.
Healy, P., Palepu, K., 1990. Effectiveness of accounting-based dividend covenants. Journal of Accounting Economics 12(1-3), 97–123.
Hennes, K.M., Leone, A.J., Miller, B.P., 2008. The importance of distinguishing errors from irregularities in restatement research, The case of restatements CEO/CFO turnover. The Accounting Review 83(6), 1487–1519.
Holthausen R., Larcker, D., Sloan, R., 1995. Annual bonus schemes the manipulation of earnings. Journal of Accounting Economics 19(1), 29–74.
Ittner, C., Larcker, D., Rajan, M., 1997. The choice of performance measures in annual bonus contracts. The Accounting Review 72 (2), 231–255.
Jayaraman, S., 2008. Earnings volatility, cash flow volatility informed trading. Journal of Accounting Research 46 (3), 809-851.
Jones, J., 1991. Earnings management during import relief investigations. Journal of Accounting Research 29(2), 193–228.
Kasznik, R., McNichols, M., 2002. Does meeting earnings expectations matter? Evidence from analyst forecast revisions share prices. Journal of Accounting Research 40(4), 727–759.
Klassen, K., Lang, M., Wolfson, M., 1993. Geographic income shifting by multination corporations in response to tax rate changes. Journal of Accounting Research 31 (Supplement), 141–173.
Klassen, K.J., 1997. The impact of inside ownership concentration on the trade-off between financial tax reporting. The Accounting Review 72(3), 455–474.
Klein, A., 2002. Audit committee, board of director characteristics, earnings management. Journal of Accounting Economics 33(3), 375–400.
Kothari, S.P., Leone, A., Wasley, C., 2005. Performance matched discretionary accrual measures. Journal of Accounting Economics 39(1), 163–197.
Larcker D., Richardson, S., Tuna, I., 2007. Corporate governance, accounting outcomes, organizational performance. The Accounting Review 82(4), 963–1008.
Larcker, D., Richardson, S., 2004. Fees paid to audit firms, accrual choices, corporate governance. Journal of Accounting Research 42 (3), 625–658.
Leuz C., Nanda, D., Wysocki, P.D., 2003. Earnings management investor protection, an international comparison. Journal of Financial Economics 69, 505–527.
Linck, J.S., Netter, J.M., Yang, T., 2008. The determinants of board structure. Journal of Financial Economics 87, 308–328.
Louis, H., 2004. Earnings management the market performance of acquiring firms. Journal of Financial Economics 74(1), 121–148.

Louis, H., Robinson, D., 2005. Do managers credibly use accruals to signal private information? Evidence from the pricing of discretionary accruals around stock splits. Journal of Accounting Economics 39(2), 361–380.

Matsumoto, D., 2002. Managements incentives to avoid negative earnings surprises. The Accounting Review 77(3), 483–514.

McNichols, M., 2002. Discussion of The quality of accruals earnings, The role of accrual estimation errors. The Accounting Review 77(Supplement), 61–69.

McNichols, M., Wilson, G.P., 1988. Evidence of earnings management from the provision for bad debts. Journal of Accounting Research 26 (Supplement), 1–31.

Meeks G., Botsari, A., 2008. Do acquirers manage earnings prior to a share for share bid? Journal of Business Finance Accounting 35 (5-6), 633–670.

Merton, R., 1974. On the pricing of corporate debt, the risk structure of interest rates. Journal of Finance 29(2), 449–470.

Modigliani, F., Miller, M., 1958. The cost of capital, corporation finance the theory of investment. American Economic Review 48, 261–297.

Nelson M.W., Skinner, D.J., 2013. How should we think about earnings quality? A discussion of 'Earnings quality, Evidence from the field'. Journal of Accounting Economics 56, 34–41.

Owens, E., Wu, J., Zimmerman, J., 2015. Business model shocks abnormal accrual models. Working paper available at SSRN, http,//ssrn.com/abstract=2365304.

Palmrose, Z-V., Richardson, V.J., Scholz, S., 2004. Determinants of market reactions to restatement announcements. Journal of Accounting Economics 37 (1), 59–89.

Peasnell K., Pope, P., Young, S., 2005. Board monitoring earnings management, Do outside directors influence abnormal accruals? Journal of Business Finance Accounting 32 (7-8), 1311–1346.

Pincus, M., Rajgopal, S., 2002. The interaction between accrual management hedging, evidence from oil gas firms. The Accounting Review 77 (1), 127-160.

Rajgopal, S., Venkatachalam, M., 2011. Financial reporting quality idiosyncratic return volatility. Journal of Accounting Economics 26(2), 415–442.

Rangan, S., 1998. Earnings management the performance of seasoned equity offerings. Journal of Financial Economics 50(1), 101–122.

Shivakumar, L., 2000. Do firms mislead investors by overstating earnings before seasoned equity offerings? Journal of Accounting Economics, 29(3), 339–371.

Shleifer, A., Vishny, R., 2003. Stock market driven acquisitions. Journal of Financial Economics 70(3), 295–311.

Skinner, D.J., Sloan, R.G., 2002. Earnings surprises, growth expectations, and stock returns or don't let an earnings torpedo sink your portfolio. Review of Accounting Studies 7, 289–312.

Srinivasan S., Wahid, A.S., Yu, G., 2015. Admitting mistakes, home country effect on the reliability of restatement reporting. The Accounting Review 90(3), 1201–1240.

Sweeney, A., 1994. Debt-covenant violations managers accounting responses. Journal of Accounting Economics 17(3), 281–308.

Teoh, S., Welch, I., Wong, T.J., 1998a. Earnings management the long-run market performance of initial public offerings. The Journal of Finance 53(6), 1935–1974.

Teoh, S., Welch, I., Wong, T.J., 1998b. Earnings management the underperformance of seasoned equity offerings. Journal of Financial Economics 50(1), 63–99.

Warfield, T., Wild, J., Wild, K., 1995. Managerial ownership, accounting choices, informativeness of earnings. Journal of Accounting Economics 20(1), 61–91.

Watts, R., Zimmerman, J., 1986. Positive Accounting Theory (Englewood Cliffs, Prentice Hall).

Xie, B., Davidson, W.N., DaDalt, P.J., 2003. Earnings management corporate governance, the role of the board the audit committee. The Accounting Review 76(3), 357–373.

Zimmerman, J.L., 2013. Myth, External financial reporting quality has a first-order effect on firm value. Accounting Horizons 27 (4), 887-894.

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* = 1961–2010.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.
ADIndex	Accounting discretion index that combines the three measures, AbsAA, Smoothing, and Freq (see Bowen et al. 2008, Leuz et al. 2003). We rank each measure from least to most discretion and then scale the ranks by the total number of observations (fractional ranks that lie between 0 and 1 where 0 is least discretion and 1 is most discretion).
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	The total number of directors on the board minus the average number of directors of firms belonging to the same firm size quartile (formed each year based on the natural logarithm of total assets). For consistency with the ordering of other board structure variables, we multiply by -1 to capture proximity to the board size of similar sized entities.
BusConcentration	The sum of the squares of firm sales in each industry segment divided over total sales.
CapIntensity	Net book value of PP&E to total assets.
CF(Incentives)	A common factor score of of all incentive variables, i.e. executive compensation *(Compensation)*, distance to default *(MertonDD)*, seasoned equity offerings (*SEO)*, shares for shares acquisitions *(ShareDeals)*, debt issues *(DebtIssues)*, meeting or beating earnings targets *(MBE*, *POSΔEARN*, *POSEARN)*, years listed (*YrsListed)*, business life cycle stage (*BLifecycle)*, negative contemporaneous returns *(NegRet)*, tax aggressiveness *(BookTax)*, industry concentration *(IndConcentration)*, and S&P500 membership *(S&PMember)* (see Appendix B for definitions)
CF(InnateFactors)	A common factor score of innate factors: firm size (*Size*), operating cash flow volatility (σ(*CFO*)), sales volatility σ(*Sales*), operating cycle *(OperCycle)*, cumulative losses (*NegEarn*), intangible assets intensity (*IntIntensity*) and capital intensity (*CapIntensity* - see Appendix B for definitions).
CG	Common factor score obtained from a factor analysis of *BoardSize*, *OutsideDirectors*, *DirectorExpertise*, *InsiderOwnership* and *Shareholder Concentration.*
DirectorExpertise	Fraction of outsider directors with industry expertise, i.e. above five years of industry specific experience. We evaluate industrial expertise based on the 4-digit SIC code industry classifications identified in Fama and French (1997).
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 for definitions and the *EQ* model).
EarnVar	Standard deviation of the firm's net income before extraordinary items (NIBE) scaled by total assets over years *t−6 to t*.
EQ	Common factor score obtained from a factor analysis of *AQ*, *AbsAA*, and *EarnVar*.
Errors	Equalsm1 when the firm has disclosed a financial statement restatement in one of its regulatory forms and Audit Analytics has classified the restatement as any other category other than financial fraud, irregularities or misrepresentations (e.g. clerical, other restatements), 0 otherwise.
Freq	The fraction of the last 12 quarterly earnings surprises that were small positives. A small positive surprise occurs when the change in seasonally lagged quarterly earnings ($E_q - E_{q-4}$) scaled by total assets at the end of quarter q-5 falls within the range if 0.00 to 0.0025 (similar to Bowen et al. 2008).
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).

GeogConcentration	The sum of the squares of firm sales in each geographic segment divided over total sales.
InnateEQ	*EQ* fitted on innate factors: firm size, operating cash flow volatility, sales volatility, operating cycle, cumulative losses, intangible assets intensity and capital intensity (see Appendix B for definitions and the *EQ* model).
InnateEQ(Q)	Quartiles of *InnateEQ* (ascending) by year.
InsiderOwnership	A composite variable representing the average within-sample and year percentile of *InsiderOwnershipPct and InsiderOwnershipVal* divided by 100. *InsiderOwnershipPct* is the percentage of stock held by insider directors. *InsiderOwnershipVal* is the number of shares held by insider directors multiplied by stock price at year end.
IntIntensity	The firm's reported R&D and advertising expense as a proportion of its sales revenues.
Irreg	Equals 1 when the firm has disclosed a financial statement restatement in one of its regulatory forms and Audit Analytics has classified the restatement as financial fraud, irregularities and misrepresentations, 0 otherwise.
Leverage	Total debt divided by total assets.
NegEarn	Proportion of losses (negative *NIBE*) for the firm over years *t−6* to year *t*.
Noise_Term	The error term from regressions of *EQ* on vector variables of innate factors and managerial incentives (see equation 1 in Appendix B).
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).
OutsideDirectors	Fraction of outside directors on the board.
ResCF(Incentives)	The residuals from panel regressions of *CF*(*Incentives*) on *EQ*.
ResCF(InnateFactors)	The residuals from panel regressions of *CF(Innate_Factors)* on *EQ*.
ResDEQ	The residual from a regression of *EQ* on the set of innate factors : firm size (*Size*), operating cash flow volatility (σ(*CFO*)), sales volatility σ(*Sales*), operating cycle *(OperCycle)*, cumulative losses (*NegEarn*), intangible assets intensity (*IntIntensity*) and capital intensity (*CapIntensity* - see Appendix B for definitions).
Restatements	Equals1 when the firm has disclosed a financial statement restatement in one of its regulatory forms (source: Audit Analytics), 0 otherwise.
ROA	Net income before extraordinary items divided by total capital.
ROE	Net income before extraordinary items divided by average book value of equity.
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*.
Salesgrowth	Percent increase in sales revenues from year *t−1* to year *t*.
SOX	Equals 1 for all accounting periods ending post-2002, 0 otherwise.
Shareholder Concentration	A composite variable representing the average within-sample and year percentile of *OutOwnVal*, *OwnConc*, *InstOwn* and *BlockInstOwn*. *OutOwnVal* is the market value of common stock minus the value of stock held by executive directors all divided by the number of shareholders at the end of the year. *OwnConc* is 1 divided by the number of common shareholders at the end of the year. *InstOwn* is the percentage of stock held by institutions. *BlockInstOwn* is the percentage of stock held by institutions owning more than 5% of the firm's shares.
Smoothness	Standard deviation of the firm's cash flow from operations (scaled by average total assets) from years *t−6* to year *t* divided the standard deviation of the firm's net income before extraordinary items s (scaled by average total assets) from years *t−6* to year *t*. Ratios in excess of one indicate more volatile cash flows compared to earnings consistent with the use of accruals to smooth earnings.
Smoothing	Equals 1 if the firm's Smoothness is higher than the industry average each year, 0 otherwise.
StdRet	Standard deviation of the firm's stock returns during year *t*.
StdRet(fInnate)	Standard deviation of the firm's stock returns during year *t* fitted on innate factors: firm size (*Size*), operating cash flow volatility (σ(*CFO*)), sales volatility σ(*Sales*), operating cycle *(OperCycle)*, cumulative losses (*NegEarn*), intangible assets intensity (*IntIntensity*) and capital intensity (*CapIntensity* - see Appendix B for definitions).
StdRet(Q)	Quirtiles of *StdRet* (ascending) by year.
Time	Trend variable equal to the difference between the contemporaneous year and 1996.
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 first record on the CRSP files.

Appendix B

Extracting innate earnings quality (*InnateEQ*) and discretionary earnings quality (*DiscEQ*).

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

$$EQ_{j,t} = a_0 + a_1 Size_{j,t} + a_2\sigma(CFO)_{j,t} + a_3\sigma(Sales)_{j,t} + a_4 OperCycle_{j,t} + a_5 NegEarn_{j,t} + a_6 IntIntensity_{j,t} + a_7 CapIntensity_{j,t} + a_8 Compensation_{j,t} + a_9 MertonDD_{j,t} + a_{10} SEO_{j,t} + a_{11} ShareDeals_{j,t} + a_{12} DebtIssues_{j,t} + a_{13} MBE_{j,t} + a_{14} Pos\Delta Earn_{j,t} + a_{15} PosEarn_{j,t} + a_{16} YrsListed_{j,t} + a_{17} BLifecycle_{j,t} + a_{18} NegRet_{j,t} + a_{19} BookTax_{j,t} + a_{20} IndConcentration_{j,t} + a_{21} S\&PMember_{j,t} + e_{j,t} \quad (1)$$

Grouping	*Variables*	*Definition*	*Relevant literature*
Innate factors	*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*.	*Dechow and Dichev (2002), Francis et al. (2004,2005)*
	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.	
Managerial Incentives \	***Contractual Arrangements***		
	Compensation	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.	*Healy (1985), McNichols and Wilson (1988), Dechow and Sloan (1991), Chen and Lee (1995), Holthausen et al. (1995), Ittner et al. (1997), Guidry et al. 1999, Cheng and Warfield (2005), Bergstresser and Philippon (2006), Burns and Kedia (2006), Efendi et al. (2007)*
	MertonDD	The probability of default based on the Merton distance to default model (Merton 1974).	*Healy and Palepu (1990), Francis (1990), Sweeney (1994), Defond and Jiambalvo (1994), Dichev and Skinner (2002), Fischer and Louis (2008)*
	Asset pricing considerations		
	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.	*Rangan (1998), Teoh et al. (1998a, 1998b), Erickson and Wang (1999), Shivakumar (2000), Shleifer and Vishny (2003), Louis (2004), Louis and Robinson (2005), Meeks and Botsari (2008), Cohen and Zarowin (2010)*
	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	*Ashbaugh et al. (2006), Bharath et al. (2008),*

	higher than 5%, 0 otherwise.	*Boubakri and Ghouma (2008), Graham et al.(2008)*
MBE	Equals 1 if the median analyst earnings forecast outstanding at the firm's earnings announcement date is equal or higher than the I/B/E/S actual earnings per share, 0 otherwise.	*Bartov et al. (2002), Kasznik and McNichols (2002), Athanasakou et al. (2011)*
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.	*Beneish (1997), Dopuch et al. (1987)*
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) classifies 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(+) 3. Mature CFO (+) CFInv(−) CFFin(−) 4. Shake−out 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 (−)	*Skinner and Sloan (2002)*
NegRet	Equals 1 if the firm's annual cumulative returns are negative, 0 otherwise.	*Beneish (1997)*
Influencing third parties		
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.	*Klassen et al. (1993), Guenther et al. (1997), Klassen (1997), Hanlon et al. (2008)*
IndConcentration	The proportion of the market share of the top five firms in each industry over the total industry sales.	*Jones (1991), Cahan (1992), Beatty et al.(1995), Han and Wang (1998)*
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.	

From equation (1) the fitted values on the innate factors represent innate earnings quality (*InnateEQ*), while the fitted values on managerial incentive variables represent discretionary earnings quality (*DiscEQ*),

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

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

Appendix B (cont'd)

Table A shows the regression results of (1). 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. We repeat equation (1) using alternative proxies for compensation incentives; i) the average bonus divided by average total assets; and following Cheng and Warfield (2005) ii) options granted during the period; iii) options exercised during the period; iv) unexercisable options and iv) shares owned by inside directors (all divided by shares outstanding). *EQ* is positively associated with bonus and option grants. Results of our empirical implementations are robust to this alternative specification of *EQ*.

Table 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		−0.505			
		(−9.94)	*Compensation*	+	0.119***
Size	−	−0.010***			(4.94)
		(−2.59)	*MertonDD*	+	0.004***
σ(CFO)	+	3.586***			(5.81)
		(20.58)	*SEO*	+	0.009**
σ(Sales)	+	0.383***			(2.05)
		(14.11)	*ShareDeals*	+	0.013
OperCycle	+	0.026***			(0.80)
		(4.18)	*DebtIssues*	−	−0.013**
NegEarn	+	0.345***			(−2.23)
		(11.77)	*MBE*	+	0.001
IntIntensity	+	−0.019			(0.26)
		(−2.29)	*PosΔEarn*	+	−0.011
CapIntensity	−	−0.199***			(−2.09)
		(−11.72)	*PosEarn*	+	−0.002
(continued in next column)					(−0.18)
			YrsListed	−	−0.001***
					(−2.85)
			BLifecycle	−	−0.021***
					(−4.69)
			NegRet	+	−0.003
					(−0.33)
			BookTax	+	0.100**
					(2.05)
			IndConcentration	+	0.094***
					(3.78)
			S&PMember	+	0.009
					(0.86)
			Observations		13,741
			Adj. R^2		0.5325

The sample consists of 13,741 observations over the period 1992−2009 for 1,823 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. The */**/*** indicate significance at the 0.1/0.05/0.01 levels (one-tailed) in the predicted direction.

Table 1

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

Variable	Mean	Std	Q1	Median	Q3
EQ	−0.318	0.312	−0.538	−0.388	−0.168
AQ	0.035	0.023	0.018	0.029	0.045
EarnVar	0.044	0.049	0.016	0.029	0.054
AbsAA	0.037	0.037	0.012	0.026	0.049
InnateEQ	0.245	0.206	0.107	0.205	0.348
DiscEQ	−0.060	0.045	−0.086	−0.061	−0.035
BoardSize	−1.567	1.228	−2.252	−1.344	−0.586
Directors(#)	9.557	2.380	8.000	9.000	11.000
OutsideDirectors	0.696	0.164	0.600	0.727	0.818
DirectorExpertise	0.255	0.286	0.000	0.143	0.500
InsiderOwnership	0.495	0.279	0.265	0.480	0.730
InsiderOwnershipPct	0.009	0.019	0.001	0.003	0.009
InsiderOwnershipVal	93.072	770.981	4.891	14.436	42.771
Shareholder Concentration	0.493	0.216	0.325	0.495	0.650
ValOutown	1,513.66	5,577.30	113.03	348.68	1,117.97
OwnConc	0.874	2.623	0.051	0.185	0.703
InstOwn	0.701	0.197	0.576	0.715	0.834
BlockInstOwn	0.151	0.139	0.000	0.132	0.240
Size	7.677	1.436	6.628	7.541	8.612
YrsListed	25.705	12.638	14.000	25.000	37.000
BusConcentration	0.744	0.784	0.493	0.805	1.000
GeogConcentration	0.726	0.268	0.488	0.762	1.000
BM	0.521	0.460	0.279	0.444	0.651
IntIntensity	0.059	0.377	0.000	0.013	0.052
ROE	0.113	1.142	0.059	0.125	0.192
Financials	0.022	0.148	0.000	0.000	0.000
Utilities	0.051	0.220	0.000	0.000	0.000

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

	EQ	*AQ*	*EarnVar*	*AbsAA*
EQ	1	0.828	0.613	0.553
		<.0001	<.0001	<.0001
AQ	0.836	1	0.319	0.195
	<.0001		<.0001	<.0001
EarnVar	0.601	0.376	1	0.178
	<.0001	<.0001		<.0001
AbsAA	0.506	0.203	0.197	1
	<.0001	<.0001	<.0001	
N	9,496			

The sample consists of 9,496 observations over the period 1996−2009 for 1,511 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. Appendix A defines all variables.

Table 2

Innate and discretionary earnings quality – construct validity

Panel A: Corporate governance constructs - the effect of SOX on innate and discretionary earnings quality

Variables	Pred. Sign	*DiscEQ* Coef. (*t*-stat)	*InnateEQ* Coef. (*t*-stat)	*DiscEQ* Coef. (*t*-stat)
Intercept		−0.073	0.239	−0.098
		(−10.67)	(10.35)	(−16.37)
SOX	−	−0.036***	0.005	−0.036***
		(−3.83)	(0.19)	(−4.42)
Time		0.003	0.000	0.003
		(3.13)	(0.02)	(3.43)
InnateEQ	+			0.105***
				(18.15)
Observations		8,811	8,811	8,811
R^2*adjusted*.		0.0208	0.0004	0.2434

Panel B: Accounting restatements, innate and discretionary earnings quality

Variables	Pred. Sign	*Irreg =1* Coef. (*t*-stat)	*Errors=1* Coef. (*t*-stat)
Intercept		−5.816***	−2.719***
		(−4.08)	(−4.55)
DiscEQ	+	4.953***	−1.717
		(2.72)	(−1.40)
InnateEQ	+	−0.318	0.881**
		(−0.29)	(2.16)
Size		0.104	0.015
		(0.56)	(0.26)
ROA		−0.623	−1.533***
		(−0.61)	(−2.89)
ROAt-1		−0.954	−0.422
		(−1.56)	(−1.22)
Leverage		−0.071	0.249
		(−0.05)	(0.75)
BM		−0.187	0.096
		(−0.74)	(0.98)
Salesgrowth		0.152	0.045
		(0.38)	(0.25)
σ(Sales)		0.974	−0.322
		(0.60)	(−0.85)
Number of restatements		43	867
Non-restatements		9,453	8,629
Observations		9,496	9,496
LR ratio		−271.99	−2,869.34

Sample description and variables definition: see Table 1 and Appendix A. In Panel A, we report the coefficient estimates from ordinary least squares (OLS) regressions of discretionary earnings quality (*DiscEQ*) and of innate earnings quality (*InnateEQ)* on a *SOX* indicator and a time trend (*TIME*). *SOX* is a dummy variable for all accounting periods ending post-2002. Observations of accounting periods ending in 2002 have been removed in this test. *Time* is a trend variable equal to the difference between the current year and 1996. In Panel B, we model the likelihood of restatements, distinguishing between the group of irregularities (*Irreg* = 1, fraud, irregularities and misrepresentations) and errors (*Errors*=1, remaining restatements), on discretionary earnings quality (*DiscEQ*), innate earnings quality (*InnateEQ*) and a set of control variables.

The */**/*** indicate significance at the 0.1/0.05/0.01 levels (one-tailed) in the predicted direction. *t*-statistics in parentheses are based on robust standard errors clustered by year and firm.

Table 3

Governance constructs and innate and discretionary earnings quality

Panel A: Pearson (above the diagonal) and Spearman (below the diagonal) correlations between the corporate governance common factor score (*CG*) and corporate governance variables.

Variables	*CG*	*Director Expertise*	*Outside Directors*	*Board Size*	*Insider Ownership*	*Shareholder Concentration*
CG	1	0.474	0.832	0.335	−0.599	−0.414
Director Expertise	0.491	1	0.232	0.028	−0.035	−0.095
Outside Directors	0.763	0.205	1	0.117	−0.256	−0.103
Board Size	0.233	0.037	0.133	1	−0.040	0.016
Insider Ownership	−0.620	−0.046	−0.263	−0.048	1	0.146
Shareholder Concentration	−0.419	−0.101	−0.115	0.010	0.152	1
N	9,496					

Panel B: Regressions of discretionary earnings quality (*DiscEQ*) on the corporate governance common factor score (*CG*) and of *CG* on innate earnings quality (*InnateEQ*).

Variables	Pred. Sign	*CG* Coef. (*t*-stat)	*CG* Coef. (*t*-stat)
Intercept		−1.316	−1.368***
		(−13.25)	(−11.71)
InnateEQ	+	0.143**	0.198***
		(2.11)	(2.75)
DiscEQ	−	−2.063***	−0.822**
		(−5.51)	(−2.16)
Size		0.151	0.112
		(14.41)	(9.23)
YrsListed			0.015
			(8.72)
BM			0.056
			(1.44)
ROE			0.001
			(0.29)
Financials			0.024
			(0.34)
Utilities			−0.059
			(−0.86)
Observations		9,496	9,496
R^2*adjusted.*		0.1711	0.2401

Sample description and variables definition: see Table 1 and Appendix A. In Panel A we report the Pearson (above the diagonal) and Spearman (below the diagonal) correlations between the corporate governance common factor score (*CG*) and individual corporate governance variables, board size, outside directors, director expertise, insider ownership, and shareholder concentration. In Panel B we report the coefficient estimates from ordinary least squares (OLS) corporate governance common factor score (*CG*) on innate earnings quality (*InnateEQ*), discretionary earnings quality (*DiscEQ*), and other known determinants affecting corporate governance (Bushman et al. 2004, Linck et al. 2008).

The */**/*** indicate significance at the 0.1/0.05/0.01 levels (one-tailed) in the predicted direction. There are no predictions for control variables. *t*-statistics in parentheses are based on robust standard errors clustered by year and firm.

Table 4
Corporate governance and discretionary earnings quality

Panel A: Regressions of discretionary earnings quality (*DiscEQ*) on corporate governance mechanisms (board structure, insider directors' ownership and shareholders concentration).

Variables	Pred. Sign	*DiscEQ* Coef. (*t*-stat)	*DiscEQ* Coef. (*t*-stat)	*DiscEQ* Coef. (*t*-stat)
Intercept		−0.080	−0.094	−0.048
		(−11.39)	(−15.22)	(−4.98)
BoardSize	−	−0.001***	−0.001***	−0.002***
		(−2.28)	(−2.78)	(−3.82)
OutsideDirectors	−	−0.011**	−0.007	−0.001
		(−1.72)	(−1.05)	(−0.10)
DirectorExpertise	−	−0.026***	−0.022***	−0.018***
		(−4.60)	(−4.41)	(−3.55)
InsiderOwnership	+	0.012***	0.011***	0.005**
		(3.83)	(3.72)	(1.71)
Shareholder	+	0.053***	0.029***	0.024***
Concentration		(11.49)	(7.88)	(6.55)
InnateEQ	+		0.089***	0.075***
			(14.04)	(11.71)
Size				−0.006
				(−7.07)
Observations		9,496	9,496	9,496
R^2*adj.*		0.1207	0.2735	0.2950

Panel B: Regressions of discretionary earnings quality (*DiscEQ*) on corporate governance mechanisms across varying levels of business environment instability, proxied by quartiles of innate earnings quality (*InnateEQ(Q)).*

Variables	*InnateEQ(Q1)* *DiscEQ* Coef. (*t*-stat)	*InnateEQ(Q2)* *DiscEQ* Coef. (*t*-stat)	*InnateEQ(Q3)* *DiscEQ* Coef. (*t*-stat)	*InnateEQ(Q4)* *DiscEQ* Coef. (*t*-stat)	Difference in coefficients *(Q4)−(Q1)/(χ^2)*
Intercept	−0.112	−0.076	−0.060	−0.043	
	(−13.00)	(−9.25)	(−7.33)	(−5.78)	
DirectorExpertise	−0.014**	−0.015**	−0.026***	−0.030***	−0.017***
	(−1.89)	(−2.22)	(−5.09)	(−5.11)	(10.58)
OutsideDirectors	−0.001	−0.010	−0.009	−0.004	−0.003
	(−0.06)	(−1.18)	(−1.24)	(−0.44)	(0.20)
BoardSize	−0.001	−0.001	−0.001	−0.004***	−0.003***
	(−0.95)	(−0.44)	(−0.65)	(−3.04)	(8.63)
InsiderOwnership	0.021***	0.008**	0.003	0.008*	−0.013***
	(3.80)	(2.06)	(0.84)	(1.58)	(8.03)
Shareholder	0.056***	0.029***	0.028***	0.018***	−0.038***
Concentration	(10.13)	(5.23)	(4.95)	(2.36)	(37.45)
Observations	9,496	9,496	9,496	9,496	

Panel C: Regressions of discretionary earnings quality (*DiscEQ*) on corporate governance mechanisms conditional on business environment instability (proxied by quartiles of innate earnings quality *InnateEQ(Q)*).

Variable	Pred. Sign	*DiscEQ* Coef. (*t*-stat)
Intercept		−0.052***
		(−4.00)
BoardSize	−	−0.001
		(−1.08)
OutsideDirectors	−	0.003
		(0.26)
DirectorExpertise	−	−0.009
		(−1.13)
InsiderOwnership	+	0.009**
		(1.95)
Shareholder Concentration	+	0.036***
		(7.29)
InnateEQ(Q)	+	0.018***
		(5.08)
DirectorExpertise × *InnateEQ(Q)*	−	−0.006**
		(−2.20)
OutsideDirectors × *InnateEQ(Q)*	−	−0.002
		(−0.44)
BoardSize × *InnateEQ(Q)*	−	−0.001**
		(−2.28)
InsiderOwnership × *InnateEQ(Q)*	−	−0.004**
		(−1.83)
Shareholder Concentration × *InnateEQ(Q)*	−	−0.006**
		(−2.21)
Size		−0.006
		(−7.69)
Observations		9,496
R^2*adj.*		0.2690

Panel D: The effect of *innate earnings quality* on corporate governance mechanisms (board structure, insider directors' ownership and shareholders concentration) controlling for discretionary earnings quality and other determinants.

Variables	*Pred. Sign*	*Director Expertise* Coef. (*t*-stat)	*Outside Directors* Coef. (*t*-stat)	*Board Size* Coef. (*t*-stat)	*Pred. Sign*	*Insider Ownership* Coef. (*t*-stat)	*Shareholder Concentration* Coef. (*t*-stat)
Intercept		−0.121	0.466	−1.250		1.000	0.761
		(−1.52)	(12.43)	(−7.13)		(25.68)	(18.21)
InnateEQ	+	0.112**	0.045**	0.065	−	−0.127***	0.123
		(2.21)	(2.28)	(0.46)		(−4.04)	(5.18)
DiscEQ	−	−0.798***	0.069	−1.793***	+	0.059*	0.322***
		(−2.97)	(0.57)	(−3.74)		(1.39)	(3.22)
Size		0.030	0.019	−0.080		−0.049	−0.019
		(4.04)	(4.77)	(−3.61)		(−9.61)	(−3.87)
Remaining controls		YES	YES	YES		YES	YES
Observations		9,496	9,496	9,496		9,496	9,496
Adj. R^2		0.0764	0.0976	0.0095		0.1005	0.1995

Sample description and variables definition: see Table 1 and Appendix A. We report the coefficient estimates obtained from ordinary least squares (OLS) regressions of corporate governance mechanisms on innate earnings quality (*InnateEQ*), controlling for firm size, discretionary earnings quality, and other known determinants (e.g. firm size, listing age, book-to-market, indicators of firms regulated industries - Bushman et al. 2004, Linck et al. 2008).

The */**/*** indicate significance at the 0.1/0.05/0.01 levels (one-tailed) in the predicted direction. There are no predictions for control variables. *t*-statistics in parentheses are based on robust standard errors clustered by year and firm.

Table 5
A single model of earnings quality

.

		EQ Coef. (*t*-stat)	*EQ* Coef. (*t*-stat)
Intercept		−0.516***	−0.545***
		(−8.82)	(−57.74)
Director Expertise	−	−0.004	−0.019***
		(−0.14)	(−3.60)
Outside Directors	−	0.045	−0.002
		(1.37)	(−0.24)
Board Size	−	−0.002	−0.002***
		(−0.72)	(−4.10)
Insider Ownership	+	0.022	0.009***
		(1.29)	(3.10)
Shareholder Concentration	+	−0.010	0.025***
		(−0.53)	(6.67)
Size	−	−0.016***	−0.016***
		(−4.49)	(−22.23)
σ(CFO)	+	3.739***	3.766***
		(15.28)	(124.69)
σ(Sales)	+	0.350***	0.401***
		(10.98)	(82.73)
OperCycle	+	0.016***	0.026***
		(2.53)	(18.37)
NegEarn	+	0.387***	0.406***
		(10.83)	(76.87)
IntIntensity	+	−0.015	−0.012
		(−1.16)	(−3.37)
CapIntensity	−	−0.200***	−0.208***
		(−10.29)	(−36.74)
Noise_Term			0.998***
			(291.70)
Observations		9,496	9,496
R^2*adj.*		0.4771	0.9861

Sample description and variables definition: see Table 1 and Appendix A. The table reports the coefficient estimates from ordinary least squares (OLS) regressions of earnings quality (*EQ*) on corporate governance mechanisms, controlling for innate factors: size, operating cash flow volatility, sales volatility, operating cycle, intangible assets intensity and capital intensity. *Noise_Term* is the error term from regressions of (*EQ*) on vector variables of innate factors and managerial incentives (see equation 1 in Appendix B).
The */**/*** indicate significance at the 0.1/0.05/0.01 levels (one-tailed) in the predicted direction. *t*-statistics in parentheses are based on robust standard errors clustered by year and firm.

Table 6
Corporate governance and discretionary earnings quality: firm fixed effects

Regressions of discretionary earnings quality (*DiscEQ*) on corporate governance mechanisms (board structure directors' ownership and shareholders concentration) using firm fixed-effects

Variables	Pred. Sign	*DiscEQ* Coef. (*t*-stat)	*DiscEQ* Coef. (*t*-stat)	*DiscEQ* Coef. (*t*-stat)	*DiscEQ* Coef. (*t*-stat)
Intercept		−0.061***	−0.011	−0.066***	−0.012
		(−14.33)	(−1.02)	(−11.92)	(−1.44)
DirectorExpertise	−	−0.020***	−0.016***	−0.013***	−0.009***
		(−13.05)	(−10.99)	(−6.24)	(−4.70)
OutsideDirectors	−	−0.013***	−0.007**	0.000	0.000
		(−3.38)	(−1.69)	(0.39)	(0.42)
BoardSize	−	−0.001**	−0.001**	−0.002	0.006
		(−2.24)	(−2.16)	(−0.40)	(1.24)
InsiderOwnership	+	0.002	0.002	0.001	0.002
		(0.91)	(0.95)	(0.48)	(0.68)
Shareholder Concentration	+	0.004	0.007	0.002	0.004
		(0.68)	(1.16)	(0.29)	(0.76)
InnateEQ	+	0.044***	0.039***		
		(7.87)	(6.99)		
InnateEQ(Q)	+			0.010***	0.010***
				(3.33)	(4.06)
DirectorExpertise × *InnateEQ(Q)*	−			−0.004***	−0.004***
				(−2.72)	(−3.61)
OutsideDirectors × *InnateEQ(Q)*	−			−0.008***	−0.008***
				(−2.58)	(−3.40)
BoardSize × *InnateEQ(Q)*	−			−0.001***	−0.001***
				(−2.46)	(−2.87)
InsiderOwnership × *InnateEQ(Q)*	−			0.000	−0.000
				(0.18)	(−0.01)
Shareholder Concentration × *InnateEQ(Q)*	−			0.001	0.001
				(0.41)	(0.62)
Firm fixed effects		YES	YES	YES	YES
Additional controls:					
Size			−0.008		−0.008
			(−5.80)		(−9.07)
BM			0.008		0.008
			(7.63)		(8.31)
ROE			−0.000		−0.001
			(−1.70)		(−1.92)
Observations		9,496	9,496	9,496	9,496
R^2*adj.*		0. 0575	0.0721	0. 0566	0.0731

The */**/*** indicate significance at the 0.1/0.05/0.01 levels (one−tailed) in the predicted direction. All estimates are from panel regression with firm fixed effects. *t*−statistics in parentheses are based on robust standard errors clustered by firm.

Table 7
Corporate governance and earnings quality − existing constructs

Panel A: Unconditional analysis

		DiscEQ Coef. (*t*−stat)	*AA* Coef. (*t*−stat)	*AbsAA* Coef. (*t*−stat)	*AbsPAAA* Coef. (*t*−stat)	*ResDEQ* Coef. (*t*−stat)
Intercept		−0.080	−0.000	0.036	0.038	−0.032
		(−11.39)	(−0.01)	(8.89)	(9.06)	(−1.06)
Director Expertise	−	−0.026***	0.004	−0.008***	−0.009***	0.000
		(−4.60)	(2.23)	(−4.83)	(−4.63)	(0.01)
Outside Directors	−	−0.011**	0.001	−0.010**	−0.010**	0.049
		(−1.72)	(0.09)	(−2.12)	(−2.03)	(1.44)
Board Size	−	−0.001***	0.000	0.000	0.000	−0.003
		(−2.28)	(1.06)	(1.21)	(0.32)	(−1.22)
Insider Ownership	+	0.012***	−0.001	0.005**	0.007***	0.019
		(3.83)	(−0.51)	(2.08)	(3.26)	(1.13)
Shareholder Concentration	+	0.053***	−0.007	0.016***	0.017***	−0.029
		(11.49)	(−2.09)	(6.04)	(5.06)	(−1.38)
Observations		9,496	9,496	9,496	9,496	9,496
R^2*adj.*		0.1207	0.0011	0.0198	0.0217	0.0019

		Smoothness Coef. (*t*−stat)	*Smoothing* Coef. (*t*−stat)	*Freq* Coef. (*t*−stat)	*ADIndex* Coef. (*t*−stat)
Intercept		2.315***	0.312***	0.207***	0.613***
		(11.24)	(6.40)	(9.45)	(52.43)
DirectorExpertise	−	−0.022	0.016	−0.005	0.013
		(−0.23)	(0.74)	(−0.38)	(2.08)
OutsideDirectors	−	−0.228	−0.083**	0.045	0.011
		(−1.03)	(−1.65)	(2.37)	(0.89)
BoardSize	−	0.018	0.009	0.000	0.004
		(0.70)	(1.43)	(0.14)	(2.33)
InsiderOwnership	+	0.193*	0.110***	−0.021	0.025***
		(1.31)	(3.57)	(−1.74)	(3.05)
Shareholder Concentration	+	−0.877	0.094***	−0.138	−0.008
		(−3.35)	(2.52)	(−7.74)	(−0.83)
Observations		9,496	9,496	9,349	9,496
R^2*adj.*		0.0082	0.0085	0.0393	0.0042

Table 7 (continued)

Panel B Analysis conditional on business environment instability

		AbsPAAA Coef. (*t*−stat)
Intercept		0.025***
		(5.92)
Director Expertise	−	−0.004*
		(−1.29)
OutsideDirectors	−	−0.004
		(−0.80)
Board Size	−	0.001
		(1.31)
InsiderOwnership	+	0.006**
		(2.20)
Shareholder Concentration	+	0.016***
		(4.02)
StdRet(Q)	+	0.009***
		(2.94)
Director Expertise	−	−0.003**
× *StdRet(Q)*		(−1.71)
Outside Directors	−	−0.002
×*StdRet(Q)*		(−0.48)
Board Size	−	−0.000
× *StdRet(Q)*		(−1.15)
Insider Ownership	−	−0.000
× *StdRet(Q)*		(−0.31)
Shareholder	−	−0.004**
Concentration×*StdRet(Q)*		(−1.94)
Observations		9,496
R^2*adj.*		0.0462

Sample description and variables definition: see Table 1 and Appendix A. Panel A reports the coefficient estimates from ordinary least squares (OLS) regressions of discretionary earnings quality (*DiscEQ*) and of existing measures of earnings quality, *AA*, *AbsAA*, *AbsPAAA*, *ResDEQ*, *Smoothness*, *Smoothing*, *Freq*, and of a discretion index, *ADIndex*, on corporate governance mechanisms. Panel B repeats the analysis conditioning the effect of corporate governance mechanisms on business environment instability

Table 8
Governance and earnings quality: earnings quality constructs versus underlying variables?

PanelA: *DiscEQ* versus underlying variables

Variable	Pred Sign	*DiscEQ* Coef. (*t*−stat)	*ResCF(Incentives)* Coef. (*t*−stat)
Intercept		−0.080	0.103
		(−11.39)	(0.95)
Director Expertise	−	−0.026***	−0.282***
		(−4.60)	(−3.10)
Outside Directors	−	−0.011**	−0.331***
		(−1.72)	(−2.76)
Board Size	−	−0.001**	0.003
		(−2.28)	(0.34)
Insider Ownership	+	0.012***	0.014
		(3.83)	(1.06)
Shareholder Concentration	+	0.053***	0.337***
		(11.49)	(4.65)
Observations		9,496	9,496
R^2*adj.*		0.1207	0.0369

Panel B: *InnateEQ* versus underlying variables.

Variables	*Pred. Sign*	*Outside Directors* Coef. (*t*−stat)	*Director Expertise* Coef. (*t*−stat)	*Board Size* Coef. (*t*−stat)	*Pred. Sign*	*Insider Ownership* Coef. (*t*−stat)	*Shareholder Concentration* Coef. (*t*−stat)
Intercept		0.508	−0.032	−1.204		0.936	0.844
		(13.11)	(−0.41)	(−6.49)		(21.16)	(21.39)
InnateEQ	+	0.051**	0.107*	0.036	−	−0.126***	0.054
		(2.22)	(1.67)	(0.25)		(−3.64)	(2.08)
DiscEQ	−	0.031	−0.848***	−1.657***	+	0.114	0.361***
		(0.26)	(−3.36)	(−3.74)		(0.75)	(3.75)
ResCF (InnateFactors)		−0.011	−0.012	0.010		0.014	0.033
		(−1.42)	(−0.59)	(0.19)		(0.92)	(4.02)
Size		0.016	0.027	−0.080		−0.045	−0.019
		(4.43)	(3.94)	(−3.63)		(−8.33)	(−3.78)
Remaining Controls		YES	YES	YES		YES	YES
Observations		9,496	9,496	9,496	9,496	9,496	9,496
Adj. R^2		0.0100	0.1020	0.0823	0.0100	0.1044	0.2184

Sample description and variables definition: see Table 1 and Appendix A. *CF(Incentives)* is a common factor of all managerial incentive variables, i.e. *Compensation*, *MertonDD*, *SEO*, *ShareDeals*, *DebtIssues*, *MBE*, *POSΔEARN*, *POSEARN*, *YrsListed*, *BLifecycle*, *NegRet*, *BookTax*, *IndConcentration*, and *S&PMember*. *ResCF(Innate_Factors)* is the residuals from panel regressions of *CF(Innate_Factors)* on *EQ*. Appendix B provides definitions for all innate factors and incentive variables.

The */**/*** indicate significance at the 0.1/0.05/0.01 levels (one-tailed) in the predicted direction. There are no predictions for control variables. *t*-statistics in parentheses are based on robust standard errors clustered by year and firm.