MANAGERIAL ABILITY AND EARNINGS QUALITY*

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ABSTRACT
We examine the relation between managerial ability and earnings quality. We find that earnings quality is positively associated with managerial ability. Specifically, more able managers are associated with fewer subsequent restatements, higher earnings and accruals persistence, lower errors in the bad debt provision, and higher quality accrual estimations. The results are consistent with the premise that managers can and do impact the quality of the judgments and estimates used to form earnings.

Keywords: Managerial ability, managerial efficiency, earnings quality, accruals quality.

Data Availability: Data is publicly available from the sources identified in the text.

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I. INTRODUCTION

We examine the relation between managerial ability and earnings quality. We anticipate that superior managers are more knowledgeable of their business, leading to better judgments and estimates and thus higher quality earnings.[1] Alternatively, the benefit of higher quality earnings may not be sufficient to warrant the time and attention of skilled management, especially if the variance of feasible estimates is small, in which case we may not find an association between managerial ability and earnings quality.[2]

While the empirical literature in the area of earnings quality has largely focused on firm-specific characteristics, such as firm size and board independence (Dechow and Dichev 2002; Klein 2002), we examine the manager-specific aspect of earnings quality. Our study is in the vein of Bertrand and Schoar (2003), who find that managers have an effect on firm choices such as acquisitions or research and development expenditures; Aier et al. (2005), who document that CFOs with more accounting expertise have fewer restatements; and Francis et al. (2008), who document that earnings quality varies inversely with CEO reputation.[3]

Our main measure of managerial ability is the score developed in Demerjian et al. (2012), although we perform robustness checks using historical returns, media citations, and manager fixed effects (e.g., Fee and Hadlock 2003; Milbourn 2003; Francis et al. 2008; Dyreng et al.

[1] Following Schipper and Vincent (2003), we consider high quality earnings to be those that are closest to true economic earnings. As they note, reported earnings will deviate from economic earnings because of recognition and measurement rules in U.S. GAAP as well as preparers' implementation decisions, including management's judgments and estimates (see also Section 2 of Dechow et al. 2010). Our focus in this paper is on the quality of management's judgments and estimates.

[2] Costs to poor earnings quality include higher cost of capital (Francis et al. 2004) and economically significant negative price reactions to the announcement of earnings restatements (Palmrose et al. 2004).

[3] We hypothesize a positive relation between ability and earnings quality, which is opposite to the relation documented in Francis et al. (2008). Francis et al. (2008) measure CEO reputation with the number of articles mentioning the executive and find that the number of news articles pertaining to the company's CEO and earnings quality based on the Dechow and Dichev (2002) accruals quality measure are negatively associated. We find that this negative relation in Francis et al. (2008) appears to be due, at least in part, to a bias in the accruals quality measure associated with GAAP implementation decisions (i.e., accounting for R&D) and extreme performance.

2010). Demerjian et al. (2012) first estimate total firm efficiency, where efficient firms are those that generate more revenues from a given set of inputs. Total firm efficiency is influenced by both the manager (i.e., managers can, to varying degrees, predict future demand and understand industry trends) and the firm (i.e., managers in larger firms can negotiate better terms). Thus, Demerjian et al. (2012) then partition total firm efficiency between the firm and the manager, and verify that the component attributed to the manager is associated with a variety of characteristics, including managerial pay and the price reaction to management departures from the firm.[4] Prior research is limited to measures such as media coverage and historical returns, which are difficult to attribute solely to the manager (versus the firm; e.g., Francis et al. 2008), or manager fixed effects, where there is evidence of a manager-specific effect, but the quantifiable effect is limited to managers who switch firms (e.g., Bertrand and Schoar 2003; DeJong and Ling 2010; Ge et al. 2011). The Demerjian et al. ability score allows us to better separate the manager from the firm and retain an ordinal ranking of quality for a large sample of firms.[5]

We expect a more able management team to estimate accruals more accurately. For example, we expect more able managers to be more knowledgeable of their client base and macro-economic conditions when estimating bad debt expense, be more knowledgeable of the expected future benefits of recorded assets, and to be more able to understand and apply complex standards (e.g., Plumlee and Yohn 2010).

[4] As we will discuss in greater detail in the following sections, Demerjian et al. (2012) estimate total firm efficiency using data envelopment analysis, a type of frontier analysis that measures relative efficiency. They then remove identifiable firm characteristics, such as size, that affect the firm's relative efficiency but are not necessarily reflective of the quality of the management team. They attribute the unexplained portion of total firm efficiency to the management team. They document that their measure outperforms existing measures of ability such as historical stock returns and media citations.

[5] The ability score is for the management team. In our setting we would like to determine the quality of the CFOs and their delegates, as we focus on the estimation of accruals, whereas CEOs are more focused on the overall strategy of the firm. Although we cannot disentangle the ability score by CEO and CFO, the ability score does encompass CFOs and their delegates, whereas media citations are, by definition, focused on the CEO. We also identify CFOs switching firms within our sample to document CFO-specific fixed effects on accruals quality and correlate the CFOs' scores from their old firms with the accruals quality after their arrival in their new firms (see Section V).

We consider four measures of earnings quality: the existence of an earnings restatement (Anderson and Yohn 2002), the persistence of earnings (Lipe 1990; Penman 2001), errors in the bad debt provision (McNichols and Wilson 1988), and the extent to which accruals map into cash flows (Dechow and Dichev 2002; Francis et al. 2008).[6] In general, we find that earnings quality is positively associated with managerial ability. This finding is consistent with the premise that capable managers are better able to estimate accruals, which results in a more precise measure of earnings.

We contribute to both the earnings quality literature and the managerial ability literature by establishing a positive and significant relation between managerial ability and earnings quality, which suggests a means to improving earnings quality. Many of the factors associated with earnings quality, such as firm size, industry, or operating cycle, result from strategic goals and competitive advantages of the firm. Consequently, it may not be advantageous to improve earnings quality by changing these characteristics. In contrast, we conclude that given the set of earnings-estimation challenges resulting from the firm's operating decisions, higher-ability managers will be able to better deal with these complexities and report higher quality earnings relative to similar firms operating in similar environments. This finding is important for board members considering the costs and benefits of managers; managerial ability affects not only the operations of the firm, but also the quality of its reported earnings, and in turn, its share-price attributes and litigation exposure. Our results also help reconcile the counter-intuitive prior findings that more reputable managers are associated with lower accruals quality (Francis et al. 2008). We find that this relation appears to be due, in part, to a bias in the accruals quality

[6] We use the term earnings quality to capture the general construct of higher quality reported earnings, while we use the term accruals quality to discuss the Dechow and Dichev (2002) estimate of earnings quality (the mapping of accruals to cash flows).

measure associated with GAAP implementation decisions (i.e., accounting for R&D) and extreme performance.

In the next section, we develop our hypothesis with a review of the literature. In Section III we describe our sample, test variables, and descriptive statistics. In Section IV we present the main results, and in Section V we consider alternative ability measures and conduct a change analysis for a subset of managers in our sample who switch firms. In the final section we conclude the study.

II. HYPOTHESIS DEVELOPMENT AND RELATED LITERATURE

Earnings quality is an important characteristic of financial reports that affects the efficient allocation of resources. Earnings are the main input to investors' and analysts' valuation models, and accordingly, firms with poor earnings quality tend to have higher cost of capital (e.g., Francis et al. 2004) and those experiencing restatements or SEC enforcement actions tend to experience an economically significant negative price reaction to the announcement (Feroz et al. 1991; Palmrose et al. 2004). Following Schipper and Vincent (2003), we define high quality earnings to be those that are closest to true economic earnings. Schipper and Vincent (2003) note that reported earnings deviate from economic earnings because of recognition and measurement rules in U.S. GAAP as well as preparers' implementation decisions, including managements' judgments and estimates.

We expect managers' ability to form accurate judgments and estimates to vary across individuals. We expect more able managers to be more knowledgeable about the firm and the industry, as well as to be better able to synthesize information into reliable forward-looking estimates to report higher quality earnings. Specifically, we expect accruals estimated by high-ability managers to be more accurate than those estimated by low-ability managers. For example, consider the allowance for bad debt estimate. A weaker manager might apply the historical rate

of bad debt for the firm, while a more knowledgeable manager will adjust the historical rate by considering the macro-economic and industry trends, as well as changes in the firm's customer base. Similarly, we expect better managers to report more accurate and justifiable depreciation rates, fair values, and other accrual estimates. Thus, holding the firm constant, we expect a more able manager to report higher quality earnings.

H1: Managerial ability is positively associated with earnings quality.

It is possible that the majority of the variation in earnings quality is driven by inflexible accounting rules, such as the required expensing of R&D, in which case we will not find an association between the ability of managers and the quality of earnings. It is also possible that the benefits to the incremental improvement in earnings quality resulting from the intervention by an able manager do not exceed the cost of that manager's time, in which case, again, we will not find an association between the manager's ability and the firm's earnings quality.

To date, the bulk of the literature on earnings quality has examined firm-specific characteristics. For example, Dechow and Dichev (2002) document that earnings quality is poorer for firms that are smaller, are experiencing losses, have greater sales and cash flow volatility, and have longer operating cycles. Each of these innate firm characteristics makes accruals more difficult to estimate. In addition to these innate characteristics, earnings quality has been found to vary with firm infrastructure, such as internal control quality (Doyle et al. 2007; Ashbaugh-Skaife et al. 2008) and monitors such as auditors (e.g., Becker et al. 1998) and boards (Klein 2002).

With respect to the effects of managers on the firm, Bamber et al. (2010) find that individual managers appear to have preferred "styles" that are associated with their propensity to issue guidance and the characteristics of the resulting guidance (e.g., the precision of the

guidance). In a similar vein, both Ge et al. (2011) and DeJong and Ling (2010) examine manager fixed effects on certain financial reporting policies, and, similar to Bamber et al. (2010), document that individual managers matter: firms' accounting and disclosure policies vary with manager fixed effects. As previously noted, this approach allows researchers to document a manager-specific effect, but it is constrained to managers who switch employers among the sample firms.

Most closely related to our study, both Aier et al. (2005) and Francis et al. (2008) examine whether earnings quality varies with managerial characteristics. Aier et al. (2005) document an association between CFO expertise (e.g., years worked as CFO, experience at another company, advanced degrees and professional certifications) and restatements; they find that firms employing CFOs with greater expertise have fewer restatements. Francis et al. (2008) examine the relation between earnings quality and CEO reputation, measured by the number of business press articles mentioning each CEO. They find a *negative* relation between CEO reputation and earnings quality. They conclude that "boards of directors hire specific managers due to the reputation and expertise these individuals bring to managing the more complex and volatile operating environments of these firms."

Finally, in the banking and insurance industry, respectively, Barr and Siems (1997) and Leverty and Grace (2011) find that managerial ability reduces the likelihood of insurer distress and the amount of time spent in distress. Both studies use data envelopment analysis (which is also the method used by Demerjian et al. (2012) to measure managerial ability) to determine the efficiency of the firm, based on industry-specific inputs and outputs, and they characterize superior managers as those who use inputs efficiently in the production process.

In sum, there is mixed evidence on the impact of managers on earnings quality. Although there is some evidence that high quality managers reduce the likelihood of financial distress, and managers with greater expertise are associated with fewer earnings restatements, Francis et al. (2008) document that more reputable managers are associated with lower earnings quality. The latter association is consistent with some firms having low-quality earnings by the nature of their business (e.g., Dechow and Schrand 2004; LaFond 2008) and these firms hiring better managers. To the extent that we are similarly confounded in our examination of the relation between managers and earnings quality, we will condition on the innate challenges affecting the firm and continue to expect more able managers to be associated with higher quality earnings, as their judgments and estimations are more informed and accurate. Specifically, although it is more difficult to estimate accruals within certain environments, such as more volatile firms, we expect that better managers can estimate accruals more accurately for a given environment (i.e., within loss firms).

We consider four earnings quality measures. The first is earnings restatements, which are de facto evidence of inaccurate earnings.[7] The second is earnings persistence; we partition earnings into accrual and cash flow components to examine accruals persistence more directly. Our third earnings quality measure is the accuracy of a specific accrual: the bad debt provision (McNichols and Wilson 1988). Finally, we examine the mapping of working capital accruals into cash from operations, based on Dechow and Dichev (2002).

[7] Some erroneous estimates of accruals are restated prospectively, in that adjustments are made going forward, but prior earnings are not restated. For these, restatements offer a weaker measure of earnings quality than the other measures we examine. Many erroneous judgments and estimates, however, are retrospectively restated. For example, when marking-to-market, managers must determine whether to rely on traded prices or other valuations when traded prices do not appear to be reflective of the fair value. And managers must determine whether or not to write-down assets based on their judgment of whether or not the assets will be realized as future benefits. Plumlee and Yohn (2010) highlight restatements for both of these settings; where managers' judgments were ex post deemed to be wrong (see their appendix). We corroborate in subsequent analyses that a large number of restatements are attributable to managerial judgments and estimates, and that these are the types of restatements that are associated with managerial ability.

Each of these measures is affected by both unintentional errors and intentional errors (i.e., earnings management), and more able managers may be more likely to introduce intentional errors, either to signal their private information about the firm or to extract perquisites from the firm and the shareholders. We focus on unintentional errors, and leave an examination of intentional errors for future research.[8]

III. DATA, VARIABLE DEFINITIONS, AND DESCRIPTIVE STATISTICS

We obtain our data from the 2010 Annual Compustat File (to calculate the bulk of our earnings quality variables and controls), CRSP (to form historical returns, an alternate managerial ability measure), Execucomp (to track CFOs across firms), IRRC (to obtain board independence data), and Audit Analytics (for recent years of restatements and internal control opinions). We also obtain several datasets made available by researchers: managerial ability (from Demerjian et al. 2012), media citations (from Baik et al. 2012), restatements (from Hennes et al. 2008 and Plumlee and Yohn 2010) and internal control quality data (from Doyle et al. 2007).

We begin with all firms with managerial ability data and at least one of our earnings quality variables. We then exclude firm-years with acquisition activity in excess of five percent of assets, resulting in a maximum of 78,423 firm-year observations from 1989–2009. The period begins with 1989 because 1988 is the first year for which firms widely reported cash flow statements, and the Dechow and Dichev (2002) earnings quality variable requires one year of historical cash flow data. The sample ends in 2009, as our earnings quality variables (described in the following section) require at least one year of future realizations. We exclude firms with

[8] Because we examine a broad cross-section, we do not expect to find strong evidence of earnings management, on average (e.g., Dechow and Skinner 2000). In the event of earnings management, however, we expect more able managers to be better able to manage earnings *successfully*, for example, accelerating sales only if they know there will be sufficient sales in the next period to cover the acceleration, thereby avoiding large accrual reversals and restatements. We leave a direct examination of the interaction between managerial ability and intentional earnings management for future research.

material acquisition activity as it could unduly affect both the measure of managerial ability and our earnings quality measures.

Variable Definitions

Managerial Ability Measure

Our main measure of managerial ability is the metric developed by Demerjian et al. (2012). Their measure of managerial ability generates an estimate of how efficiently managers use their firms' resources. All firms use common resources—capital, labor, innovative assets—to generate output: revenues. High quality managers will generate a higher rate of output from given inputs than lower quality managers, for example by applying superior business systems and processes (supply chains, compensation systems).

Demerjian et al. (2012), use data envelopment analysis (DEA) to estimate firm efficiency within industries, comparing the sales generated by each firm conditional on the inputs used by the firm (Cost of Goods Sold, Selling and Administrative Expenses, Net PP&E, Net Operating Leases, Net Research and Development, Purchased Goodwill, and Other Intangible Assets).[9] Thus, the measured resources reflect assets (tangible and intangible), innovative capital (R&D), and other inputs that are not reported separately in the financial statements (labor, consulting services) but whose costs are included in cost of sales and SG&A. We provide the motivation for, and definition of, each of these variables in the appendix (see also Demerjian et al. 2012).

Demerjian et al. use DEA to solve the following optimization problem:

$$max_{v}\ \boldsymbol{\theta} = \frac{Sales}{v_1 CoGS + v_2 SG\&A + v_3 PPE + v_4 OpsLease + v_5 R\&D + v_6 Goodwill + v_7 OtherIntan}$$

[9] DEA is a form of frontier analysis. DEA calculates efficiency as the ratio of weighted outputs to weighted inputs. DEA uses an optimization program to determine the firm-specific optimal weights (termed "implicit weights") on the inputs and outputs. The implicit weights capture the efficiency of the firm based on the selected inputs and outputs, allowing the optimal mix of inputs and outputs to vary by firm. This differs from other efficiency measures (e.g., ROA or ROE) that require an explicit set of weights (generally equal to one). Since Demerjian et al. (2012) have only one output (sales), its weight is standardized to one across observations. For the general DEA model, please see the appendix.

The optimization finds the firm-specific vector of optimal weights on the seven inputs, $\boldsymbol{\nu}$, by comparing each of the input choices of the firm under study to those of the other firms in its estimation group. The efficiency measure that DEA produces, $\boldsymbol{\theta}$, can take a value between zero and one (due to constraints in the optimization program). Observations with a value of one are the most efficient; the set of firms with efficiency equal to one trace a frontier through the efficient set of possible input combinations. Observations with efficiency measures less than one fall below the frontier. The score indicates the degree to which the firm is efficient. A firm with a score of less than one would need to reduce costs or increase revenues to achieve efficiency.

The efficiency measure generated by the DEA estimation is attributable to both the firm and the manager, similar to other measures of managerial ability such as historical returns and media coverage. For example, a more able manager will be better able to predict trends, regardless of the size of the firm, while a manager in a larger firm will be better able to negotiate terms with suppliers, regardless of his or her quality. Demerjian et al. (2012) therefore modify the DEA-generated firm efficiency measure by purging it of key firm-specific characteristics that they expect to aid or hinder management's efforts: firm size, market share, positive free cash flow, and firm age (all aiding management), and complex multi-segment and international operations (challenges to management). They estimate the following Tobit regression model by industry:[10]

$$\begin{aligned} \textit{Firm Efficiency} = {} & \beta_0 + \beta_1 \textit{Ln(Total Assets)} + \beta_2 \textit{Market Share} + \beta_3 \textit{Positive Free} \\ & \textit{Cash Flow} + \beta_4 \textit{Ln(Age)} + \beta_5 \textit{BusinessSegmentConcentration} + \beta_6 \textit{Foreign} \\ & \textit{Currency Indicator} + \textit{Year Indicators} + \varepsilon \end{aligned} \qquad (1)$$

[10] To the extent that managers also affect some of the independent variables in Equation (1), such as free cash flow, the final managerial ability score is a conservative (understated) measure of managerial efficiency. We also supplement Demerjian et al.'s estimation by including risk as an additional independent variable (measured using leverage and beta). We control for risk because superior operating performance that results from riskier operations is not necessarily indicative of higher ability managers. We find similar results when we control for risk, indicating that the ability measure is not simply picking up firms with riskier operations.

The residual from the estimation is attributed to the management team, and is our main measure of managerial ability. We decile rank *Managerial Ability* by year and industry to make the score more comparable across time and industries and to mitigate the influence of extreme observations. Results are similar using a continuous variable (results not tabulated).

Demerjian et al. (2012) validate this measure by performing a number of validity tests. First, the managerial ability measure is strongly associated with manager fixed effects, suggesting it reflects manager characteristics, not just firm characteristics. Second, they document a negative (positive) stock price reaction when high-ability (low-ability) CEOs announce they are leaving the firm. Third, they find that replacing CEOs with new CEOs of higher ability (lower ability) is associated with improvements (declines) in subsequent firm performance. The managerial ability score is also positively correlated with CEO pay and historical returns and outperforms historical returns, historical ROA, compensation, tenure and media citations in each of their tests. Together, their validity tests provide strong evidence that the managerial ability score reflects managerial talent that is distinct from firm characteristics.

While the Demerjian et al. (2012) score is our main measure of managerial ability, it has several possible sources of error in its measurement. First, as acknowledged in Demerjian et al. (2012), in the first-stage (DEA estimation) the inputs and output are measured with noise. For example, the accounting variables can be manipulated by management (e.g., sales) and can be measured differently across firms (e.g., cost of goods sold), and some variables of interest, such as advertising or purchased research and development are not available for most firm-year observations. To the extent that certain input data is not available or is measured with error, the production function underlying the DEA estimation is potentially incomplete or inaccurate. In addition, the second-stage estimation attributes any firm efficiency outside of the set of the

identified firm features (i.e., the explanatory variables in equation (1)) to managerial ability. If the set of firm features is incomplete, the measure may overstate managerial ability by attributing efficiency inherent to the firm to the manager. Thus, in Section V we also consider alternative measures, including media citations, historical stock returns, and manager fixed effects.

Earnings Quality Measures

As noted in the review of earnings quality by Dechow et al. (2010), there are a multitude of earnings quality measures used in the literature (see their page 345). Our goal in this study is to examine the impact of managers on accrual estimation, so we select earnings restatements, earnings persistence, errors in the bad debt provision, and the mapping of accruals into cash flows as our four measures of earnings quality. We select these measures because increased correspondence between accruals and the associated economic activity likely reduces earnings restatements, increases earnings persistence, and lowers the likelihood of errors in accruals. We expect that better managers are able to report accruals that more closely correspond to the underlying economic activity; thus we expect the earnings quality metrics that are affected by judgments and accrual estimation to vary with managerial ability. For each of these measures, we consider earnings quality in year t+1 onwards, i.e., in subsequent periods to when managerial ability is measured (in year t). This reduces the likelihood that an economic shock concurrently affects both our measurement of ability and earnings quality. We discuss each earnings quality metric in greater detail in Section IV.[11]

[11] We do not consider the absolute value of discretionary accruals, earnings smoothness and benchmarking, as the relation between improved accruals estimation and these metrics is not clear. For example, abnormally high accruals may be high quality accruals that are associated with cash flows, while abnormally low accruals may simply reflect extremely negative performance, which also reflects the underlying economics of the firm. Neither of these "abnormal" accruals provides information on the manager's ability to appropriately estimate accruals, as the measure does not incorporate ex post realizations. We do not consider timely loss recognition, as it is not apparent whether more or less timely loss recognition better reflects the underlying economics of the firm. As noted in Dechow et al. (2010), ERCs are a poor measure of earnings quality because much of the earnings information can be voluntarily disclosed prior to the earnings announcement. Finally, of the three external indicators of earnings quality—restatements, AAERs and internal control disclosures—we consider only restatements. We do not consider

Control Variables

Our main set of control variables is based on the firm-specific determinants of earnings quality noted in Dechow and Dichev (2002) and Hribar and Nichols (2007): firm size, proportion of losses, sales volatility, cash flow volatility, and operating cycle. We also control for whether or not the company's auditor is a national audit firm, which is known to affect earnings quality (e.g., Becker et al. 1998). Finally, we control for change in sales growth and abnormal returns to control for growth and economic shocks to performance, both of which could potentially impact our measures of managerial ability and earnings quality. We provide variable definitions and measurement periods in Table 1.

Descriptive Statistics

We present descriptive statistics in Table 1; for each of our transformed variables (*MgrlAbility, Historical Ret, Media Citations, Aggregate AQ, Annual AQ, Firm Size,* and *Operating Cycle*), we present the untransformed variable for ease of interpretation. Managerial ability has a mean and median close to zero, by construction, as this is a residual from Equation (1). The five-year historical return has a mean of approximately 6 percent, and on average, CEOs are cited by the media approximately 44 times a year (219 times over five years). Approximately 13 percent of firms experience a restatement in the next three years, and firm-specific earnings persistence is approximately 0.23, on average.[12] The error in the provision for bad debt as a

AAERs because these tend to be more fraudulent than basic errors in estimation (Hennes et al. 2008). We do not consider internal control deficiencies as an outcome because the determinants of internal control problems are largely firm-specific, such as having adequate resources to establish and maintain these controls. The role of an able manager in the determination of strong internal controls is less clear, and does not speak to management's ability to estimate accruals.

[12] We identify the firm-specific persistence in order to have a stand-alone measure of persistence. The 0.23 firm-specific persistence coefficient is lower than typical cross-sectional persistence coefficients because it is a time-series, firm-specific coefficient, based on quarterly observations of EPS (rather than the more traditional annual observations of ROA). When we estimate a time-series regression by year we find a mean EPS persistence coefficient of just over one and an ROA persistence coefficient of about 0.70, but our sample size falls dramatically given the number of years required.

percentage of sales (*BDE Error*) has a mean and median of 0.01. Mean (median) *Aggregate AQ* is –0.03 (–0.03), similar to that in Francis et al. (2004) and Dechow and Dichev (2002) (we have multiplied the standard deviation by negative one). Interestingly, *Annual AQ* appears to have a very similar distribution to the four-year standard deviation, with a mean of –0.06 and a similar median and first and third quartile to the aggregate variable.

In Panel B of Table 1 we partition our main earnings quality measures by managerial ability, where low-quality (high-quality) managers are those in the bottom (top) quintile of managerial ability, where quintiles are formed by industry-year. Historical returns are significantly larger among high quality managers, consistent with Fee and Hadlock (2003) and Demerjian et al. (2012), although media citations are significantly lower for managers with higher ability. We explore the relations between these ability measures more completely in Section V.

Restatements are more prevalent among low-quality managers, median firm-specific earnings persistence is higher among high-quality managers, and errors in the provision for bad debt are larger among low-quality managers, providing initial support for our hypothesis. We do not, however, find consistent evidence when examining earnings quality based on the Dechow and Dichev (2002) measure; we explore this further in our multivariate analysis.

We present a correlation matrix in Table 2. In general, the results support our ability measure: better managers are negatively correlated with losses and positively correlated with future earnings. Managerial ability is negatively correlated with restatements and errors in the provision for bad debt, and positively correlated with firm-specific earnings persistence. The Dechow and Dichev (2002) accruals quality measures, however, are negatively associated with managerial ability, consistent with Francis et al. (2008) and our results in Panel B of Table 1.

IV. TEST DESIGN AND RESULTS

Earnings Restatements

Our first measure of earnings quality is earnings restatements, which are ex post evidence of erroneous earnings and thus have been used as a signal of poor earnings quality (e.g., Anderson and Yohn 2002; Aier et al. 2005; Doyle et al. 2007; Dechow et al. 2010). Although restatements can occur for reasons other than errors in accrual estimation (our focus), this earnings quality measure is the least reliant on an estimation procedure and thus provides a relatively unambiguous signal of earnings quality. Moreover, we expect restatements to be associated with errors in accrual estimation, as most restatements impact an accrual account (Palmrose and Shultz 2004). This assertion is supported by Plumlee and Yohn (2010) who find that a large number of restatements are a result of management's judgments and estimates.[13]

Restate is an indicator variable that is equal to one if there is an announcement of a financial restatement in years t+1, 2 or 3. In our main analysis, we use the restatement data from Hennes et al. (2008) for restatements announced from 1997–2006 and from Audit Analytics for restatements announced from 2007–2010.[14] We then supplement our main analysis with those restatements identified as due to management's judgments and estimates per Plumlee and Yohn (2010), using the sample from their study.[15]

To determine whether managerial ability varies with earnings restatements, we estimate the following equation using a pooled logistic regression:

$$Restate_{t+1,t+3} = \alpha_0 + \boldsymbol{\alpha_1\ MgrlAbility_t} + \alpha_2\ Firm\ Size_t + \alpha_3\ Sales\ Volatilty_{t-4,t}$$

[13] Although, some accrual errors will result in prospective adjustments, other mistakes in judgments and estimates will result in retroactive restatements (Plumlee and Yohn 2010). For example, Plumlee and Yohn (2010) provide examples of how complexity and mistakes in judgments result in restatements. For example, firms have restated earnings when they chose to rely on their own estimate of fair value for a security whose last traded price was not necessarily indicative of fair value and ex post the SEC disagreed with the judgment made by management. As another example, firms have been required to restate earnings when subsequent information differs from management's expectations at the end of the fiscal year.

[14] We thank the authors for the GAO-based dataset, which is available at http://sbaleone.bus.miami.edu/.

[15] We thank the authors for providing us both the restatement data and their coding of the restatements between those related to judgments and estimates and other restatements.

$$+ \alpha_4 \, Cash\ Flow\ Volatility_{t-4,t} + \alpha_5 \, Operating\ Cycle_{t-4,t} + \alpha_6 \, Losses_{t-4,t}$$
$$+ \alpha_7 \, NationalAuditor_t + \alpha_8 \Delta SalesGrowth_t + \alpha_9 \, AbnormalReturn_t + \varepsilon_{t+1,t+3} \quad (2)$$

We include each of the control variables discussed above. Because our tests rely on panel data, standard errors may be correlated within years and across time by firm. Thus, we either cluster our standard errors by firm and year following Petersen (2009) or include firm fixed effects in this and all subsequent estimations, unless otherwise noted.

Results are presented in Table 3; in the first (second) estimation, we consider all restatements, and exclude (include) firm fixed effects. As in our univariate analysis, we document a negative relation between managerial ability and restatements, supporting our hypothesis that more able managers are associated with higher quality earnings. The more efficient the manager, the less likely the firm is to restate ($\beta_1 = -0.21$; $p < 0.05$). Given that the unconditional likelihood of having a restatement is 13 percent, the marginal effect is economically significant at –2.4 percent (not tabulated).

In the second set of estimations, we examine the restatements from 2003–2006 considered in Plumlee and Yohn (2010) and partition the sample between those restatements associated with management's judgments and estimates (column 3) and all other restatements (column 4). We find that only those restatements associated with management's judgments and estimates are associated with managerial ability.[16] These findings support our use of *Restate* as an earnings quality metric impacted by managers' judgments and estimates. A limitation, however, of *Restate* as a measure of earnings quality is that many errors in judgments and accruals estimates will not result in a retrospective restatement. This illustrates the importance of considering multiple earnings quality measures. We expect each of our remaining earnings

[16] We do not estimate these specifications with firm fixed effects, which require variation in the dependent variable for estimation and thus result in a sample size of only 1,834 (of the 10,568) observations.

quality measures to be lower in the presence of errors in judgments and estimates, even when these errors do not trigger a restatement.

Earnings Persistence

Our second measure of earnings quality is earnings persistence, which is frequently discussed as a measure of earnings quality (e.g., Penman 2001, 623; Revsine et al. 2002, 245). We expect higher-ability managers to choose better projects, have an improved understanding of risk, and better manage the firm's operations (by construction). Thus, we expect more able managers to have more persistent earnings, and expect this effect to come through both accruals and cash flows (both of which are designed to reflect the underlying economics of the firm). Prior research has shown, however, that accruals tend to have a lower persistence than cash flows, and one reason for this is that they contain more uncertainty, thereby requiring managerial estimation. Thus, in addition to more persistent accruals and cash flows related to operations, we expect an incremental effect of managerial ability on the persistence of the accrual component of earnings. In sum, we have two expectations related to our hypothesis that higher-ability managers report higher quality earnings: (1) earnings reported by higher-quality managers are more persistent than earnings reported by lower-ability managers, and (2) higher-ability managers' impact on accruals exceeds their impact on cash flows because the former reflects both operational efficiency *and* superior accrual estimation. We examine earnings persistence using the following model:

$$Earnings_{t+1,t+n} = \alpha_0 + \alpha_1 Earnings_t + \alpha_2 \boldsymbol{Earnings_t \times MgrlAbility_t} + \alpha_3 MgrlAbility_t + \alpha_4 Firm\ Size_t + \alpha_5 SalesVolatility_{t-4,t} + \alpha_6 CashFlowVolatility_{t-4,t} + \alpha_7 OperCycle_{t-4,t} + \alpha_8 Losses_{t-4,t} + \alpha_9 NationalAuditor_t + \alpha_{10} \Delta SalesGrowth_t + \alpha_{11} AbnormalReturn_t + \varepsilon_{t+1,\ t+n} \quad (3)$$

We calculate earnings as earnings before extraordinary items (Xpressfeed (hereafter "XFN") variable =IBC) scaled by average total assets (XFN=AT) and then separate earnings into

accruals and cash flow components. Because earnings persistence is not desirable for loss firms, we estimate profit and loss firms separately and only tabulate results for profit firms.[17]

We present the results in Table 4. We first examine the impact of managerial ability on earnings persistence and then more formally examine our hypothesis by investigating the relative impact of ability on the persistence of accruals and cash flows. Turning to the first column of estimates, which control for firm fixed effects, the base persistence is 0.30 and this persistence is increasing with managerial ability. Earnings persistence is expected to increase from 0.30 to 0.66 (0.30 + 0.36) for firms with positive earnings when moving from the lowest to the highest decile of managerial ability. Although not tabulated, we find similar results when firm fixed effects are excluded.

When we partition earnings into accruals and cash flows, managerial ability increases the persistence of both components, but increases the accrual component more than the cash flow component. The accruals reported by positive earnings firms have a base persistence of 0.36 when firm fixed effects are excluded. The incremental coefficient on accruals for firms with higher ability managers is 0.42 ($p < 0.01$). In comparison, the base persistence of cash flows is 0.69, and the incremental coefficient on cash flows for firms with higher ability managers is 0.26 ($p < 0.01$), and this incremental effect is statistically smaller than that of accruals. We find similar results when we include firm fixed effects in the model. These findings support our hypothesis that higher quality managers are better able to estimate accruals, resulting in higher earnings quality, and also support that higher quality managers are better able to effectively operate their business.

[17] Note that for this particular test, in order to continue to present the dependent variable in year t+1, we include earnings in year t, which are reported in the same period in which managerial ability is estimated. Results are not sensitive to this timing choice. For example, conclusions remain unchanged if we continue to measure managerial ability at time t, but consider how much of year t+1 earnings persists into year t+2 (not tabulated).

We also replace one-year forward earnings with average earnings from year t+1 to t+3 in order to reduce the impact of economic shocks occurring in any particular year. Results are similar, although the interaction between managerial ability and accruals becomes insignificant when firm fixed effects are excluded.

McNichols and Wilson (1988) Error in the Provision for Bad Debt

Our third measure of earnings quality is the provision for bad debt, modeled in McNichols and Wilson (1988), as follows:

$$\textit{Bad Debt Expense}_t = \beta_0 + \beta_1 \textit{Allowance for Doubtful Accounts}_{t-1} + \beta_2 \textit{Write-offs}_t + \beta_3 \textit{Write-offs}_{t+1} + \phi_t \quad (4)$$

where *Bad Debt Expense* and *Write-offs* are hand-collected from the firm's SEC filings and *Allowance for Doubtful Accounts* is available from Xpressfeed (XFN = RECD). All variables are deflated by sales in year t. Implicit in our use of this model is a balance sheet perspective to estimating bad debt, adherence to GAAP, and perfect foresight of future write-offs.

The error (ϕ_t) has two components: a discretionary "earnings management" component, and a forecast error component (McNichols and Wilson 1988). If managers' estimates are unbiased, on average, then errors in the bad debt accrual will vary with forecast accuracy, and we expect this error (ϕ_t) to decrease with managerial ability. Jackson and Liu (2010), however, present evidence that the mean earnings management portion of ϕ_t is positive; specifically, they find that managers tend to overstate the allowance for doubtful accounts which they can later reverse into income. Under the assumption that all managers engage in the same degree of

earnings management, the variation in the bad debt error will be driven by variation in accrual-estimation quality, and thus we continue to expect the error to decrease with managerial ability.[18]

Because the data for this analysis must be hand-collected from SEC filings, we limit the analysis to firms with managers in the top or bottom quintiles of managerial ability. We further limit the sample to three accounts-receivable-intensive industries: (1) printing and publishing, (2) nondurable wholesale goods, and (3) business services, following McNichols and Wilson (1988), and we estimate:

$$\begin{aligned} BDE\ Error_{t+1} = {} & \beta_0 + \boldsymbol{\beta_1\ High\ Ability\ Indicator_t} + \beta_2\ Firm\ Size_t + \beta_3\ Losses_t + \beta_4\ SalesVolatility_t \\ & + \beta_5\ Cash\ Flow\ Volatility_t + \beta_6\ Operating\ Cycle_t + \beta_7\ NationalAuditor_t \\ & + \beta_8\ \Delta SalesGrowth_t + \beta_9\ AbnormalReturn_t + \varepsilon_{t+1} \end{aligned} \quad (5)$$

where *BDE Error* is the absolute value of the residual from Equation (4), and *High Ability Indicator* is an indicator variable that is equal to one (zero) if the managerial ability score in year *t* is in the top (bottom) quintile relative to industry-year peers. A negative coefficient on *High Ability Indicator* is consistent with more able managers forming better estimates of bad debt provisions. Results are presented in Table 5. In support of our hypothesis, β_1 is –0.01 ($p < 0.01$). Managers with higher ability scores produce higher quality bad debt provisions.[19]

The Dechow and Dichev (2002) Measure of Earnings Quality

Our fourth and final measure of earnings quality follows Dechow and Dichev (2002), who posit that high quality accruals are eventually realized as cash flows. Incorrectly estimated

[18] Alternatively, if higher-ability managers engage in more earnings management, then our tests are conservative. Only if higher ability managers engage in less earnings management, would the findings of Jackson and Liu (2010) weaken the basis for our conclusions. In this setting, the negative relation between managerial ability and the bad debt error (ϕ_t) could result from better estimations, less earnings management, or both. In this latter case, the bad debt error analysis is a weak test of the relation between managerial ability and estimation quality, but continues to speak to the broader conclusions regarding earnings quality.

[19] Because our sample selection procedures for this analysis result in a small sample of firm-years that do not necessarily contain the same firm over multiple years (i.e., we do not have panel data), we do not cluster standard errors by firm and year, nor do we estimate a firm fixed effects specification. In untabulated results, however, we continue to observe the negative relation between managerial ability and *BDE Error* when we cluster standard errors by year or include year fixed effects.

accruals are less likely to be realized as cash flows. We hypothesize that the better managers know their business, the less likely they are to have erroneous accruals. We determine how well a firm's accruals map into cash flows by estimating the following regression by industry (Fama and French 1997) and year.[20]

$$\Delta WC_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 \Delta REV_t + \beta_5 PPE_t + \varepsilon_t \quad (6)$$

The residual from the regression measures the extent to which current accruals map into past, present, or future cash flows, with smaller residuals (in absolute terms) indicating superior mapping. Following McNichols (2002), we include the current year change in sales (ΔREV) and the current year level of property, plant, and equipment (PPE) in Equation (6); variable definitions are in Table 1.

We generate two earnings quality measures from the residuals of the above regression. First, following prior research, we take the standard deviation of a the residual over a rolling four-year period, and multiply this standard deviation by negative one so that the variable is increasing with earnings quality. Thus, $Aggregate\ AQ_t = -1 \times$ Standard Deviation (ε_{t+1}, ε_{t+2}, ε_{t+3}, ε_{t+4}). Because managers may not necessarily be in place for the full aggregation period, we also introduce a variation on the Dechow and Dichev (2002) model by considering the residual from Equation (6) directly. The greater the residual, in absolute terms, the poorer the accruals quality. Thus, $Annual\ AQ_t = -1 \times |\varepsilon_{t+1}|$; the two accruals quality measures are correlated at 0.45 (see Table 2). To maintain consistency with our managerial ability measure, we decile rank our earnings quality variables by year and industry.

To examine our hypothesis using this measure of earnings quality, we estimate the following regression:

[20] If an industry group has less than 20 observations in any given year, those observations are deleted.

$$AQ_{t+1,t+n} = \alpha_0 + \boldsymbol{\alpha_1 MgrlAbility_t} + \alpha_2 Firm\ Size_t + \alpha_3 SalesVolatility_{t-4,t} + \alpha_4 CashFlowVolatility_{t-4,t} + \alpha_5 OperCycle_{t-4,t} + \alpha_6 Losses_{t-4,t} + \alpha_7 NationalAuditor_t + \alpha_8 \Delta SalesGrowth_t + \alpha_9 AbnormalReturn_t + \varepsilon_{t+1,t+n} \quad (7)$$

where AQ_t is either *Aggregate* AQ_t or *Annual* AQ_t. We present the results in Table 6. We find, counter to our expectations, that earnings quality is decreasing in managerial ability across both Dechow and Dichev (2002) accruals quality measures when firm fixed effects are excluded, and is insignificant or marginally significant when firm fixed effects are included.

LaFond (2008) suggests that the underlying economic activities of firms might unduly affect the Dechow and Dichev (2002) accruals quality measure. For example, it is possible that firms that have large R&D expenditures have a weaker mapping between working capital accruals and cash from operations because of their underlying earnings process, and these firms are also more likely to hire better managers (LaFond 2008). This logic parallels that of Schipper and Vincent (2003), who note that reported earnings deviate from economic earnings because of preparers' implementation decisions, including management's judgments and estimates (the focus of this paper), as well as recognition and measurement rules in U.S. GAAP (e.g., accounting for R&D). Along these lines, Dechow and Dichev (2002) argue that accruals quality will be systematically related to firm and industry characteristics and identify a number of these characteristics: firms size, losses, volatility and operating cycle. Francis et al. (2004) build on this by partitioning the accrual quality measure into two components: innate, which is the component associated with features of firms' business models and operating environments (e.g., volatility, losses, size), and the residual.

$$AQ_t = \beta_0 + \beta_1\ Firm\ Size_t + \beta_2\ Losses_{t-4,t} + \beta_3\ Sales\ Volatility_{t-4,t} + \beta_4\ Cash\ Flow\ Volatility_{t-4,t} + \beta_5\ Operating\ Cycle_{t-4,t} + \varepsilon \quad (8)$$

Specifically, innate accruals quality is the fitted value of Equation (8) and reflects the expected mismatch between accruals and cash flows because of the above-identified innate

characteristics. Francis et al. (2004) note that the residual reflects management's reporting and implementation decisions (i.e., earnings management), but in this paper we posit that it also reflects mismatches between working capital accruals and operating cash flows because of GAAP requirements, such as immediately expensing R&D. That is, the error term from Equation (8) is impacted by factors other than managerial discretion. In addition, the innate portion of AQ reflects predicted accruals quality given the firm's constraints (e.g., volatile sales). Yet, conditional on a given business model and operating environment, we expect a better manager to be able to estimate accruals more accurately, and thus be associated with better mappings between accruals and cash flows. Specifically, among two firms of the same size, with the same operating cycle, and the same level of volatility and losses, we expect a better manager to estimate accruals more accurately. We cannot make a similar prediction for the residual component of accruals quality because our focus is on accuracy of accrual estimation, and we anticipate that the residual reflects both the effect of earnings management and the effect of recognition and measurement rules in U.S. GAAP, and the latter is a dimension that cannot be overcome by managerial ability. In other words, certain necessary firm activities, such as investment in R&D, result in seemingly "erroneous" accruals under the Dechow and Dichev (2002) accruals quality model, but they are not actually estimation errors; rather, they are lower-quality accruals that are a product of GAAP rules (e.g., Schipper and Vincent 2003; LaFond 2008) and cannot be "corrected" by superior estimation skill.

To investigate the association between managerial ability and the two components of accruals quality, we estimate the following:

$$AQ\ Component_{t+1,\,t+n} = \beta_0 + \boldsymbol{\beta_1 MgrlAbility_t} + \beta_2 Firm\ Size_{t-1} + \beta_3 NationalAuditor_t + \beta_4 \Delta SalesGrowth_t + \beta_5 AbnormalReturn_t + \varepsilon_t \quad (9)$$

As noted above, we expect that managers can affect the innate component of accruals quality by exerting effort and having firm- and industry-specific knowledge. We exclude the control variables that were used to partition total accruals quality into the innate and discretionary components. To control for size, we include the lagged decile rank of firm size. Results are presented in Table 7. We consider *Aggregate AQ* (the four year standard deviation) and *Annual AQ* (the one year residual) in the first and second set of columns, respectively. Turning first to the innate component of accruals quality, we see that managerial ability is positively associated with innate accruals quality for both *Aggregate AQ* and *Annual AQ* and in specifications that include and exclude firm fixed effects. Thus, when focusing on the component of accruals quality that we posit is subject to judgments and estimates, managerial ability results in higher quality accrual estimation, consistent with our hypothesis. In further support that this component has a "correctable" component, note that *National Auditor* is also positive and significant in each of the four estimations of innate accruals quality.

Managerial ability is negatively associated with the unexplained component of accruals quality, however, indicating that the negative relation between managerial ability and total accruals quality is driven by the unexplained portion of accruals quality. Also note that *National Auditor* is not associated with this component of accruals quality in three of the four estimations, suggesting that much of it is a byproduct of GAAP rules rather than subjective estimation decisions.

We interpret the above findings as supporting our hypothesis, but clearly this is contingent on our interpretation of the two components of total accruals quality. Thus, we validate the above partitioning by: 1) investigating the two components' associations with earnings restatements, and 2) examining whether better managers reduce both positive and

negative accrual errors as we expect based on better managers reporting more accurate accruals, as opposed to alternative explanations such as performance shocks affecting our measures of earnings quality and managerial ability.

First, generally, we expect low estimation-related accruals quality (i.e., innate) to be associated with subsequent restatements. We have no prediction, however, for the association between the unexplained portion of accruals quality and earnings restatements; earnings management should be more associated with restatements, but low accrual quality as a result of GAAP should not be associated with subsequent restatements. Consistent with our expectations, Table 8 shows that the innate portion of accruals quality is negatively associated with earnings restatements in all specifications. Although the discretionary component is also negatively related to *Restate* in three of the four specifications, the coefficient on *Innate AQ* is significantly larger than the coefficient on *Discretionary AQ* in all four estimations ($p< 0.10$; not tabulated). This finding suggests that the innate component of accruals quality, at least in part, reflects correctable errors in accrual estimation.

Second, we investigate the relation between managerial ability and the signed accruals quality errors in an effort to identify whether the associations are systematically affected by extreme performance. If higher-ability managers report more accurate accruals than we expect them to report accrual errors that are closer to zero regardless of the sign of the accrual error. As with all of our accruals-quality variables, we rank the error term annually within each Fama and French industry. Also, for ease of interpretation, we use the absolute value of the error, if negative, so that across all specifications a negative coefficient corresponds to a smaller error (i.e., an error closer to zero). Thus, we expect a negative coefficient on *MgrlAbility* if higher-ability managers report more accurate accruals.

We report the results in Table 9. The first two columns provide the signed errors for the innate portion of accruals quality, and we document a negative relation between managerial ability and the absolute value of both positive and negative errors. Specifically, managerial ability reduces the error, in both directions, as expected. When we extend our examination to the residual component of accruals quality, however, we see a positive association between managerial ability and positive errors, while there is no association between ability and negative errors. This could be indicative of earnings management, but could also simply be a reflection of extreme performance or GAAP requirements, both of which could lead to the appearance of greater errors.

In the final set of results we corroborate that the positive errors in the discretionary component of accruals quality are positively associated with both performance and R&D activity (our proxy for GAAP implementation issues) by supplementing the model with two variables: 1) abnormal returns measured contemporaneously with accruals quality ($AbnormalRet_{t+1}$), and 2) the standard deviation of Research and Development expense over the next three years ($Future\ R\&D_{stdev}$). The coefficients on both variables are positive and significant. This suggests that the discretionary component of accruals quality is affected by both abnormal performance and GAAP rules. We leave further exploration of this result to future research.

In sum, we find that higher ability managers report lower annual accruals quality errors relative to similar firms facing similar estimation challenges—a result that holds regardless of whether the accrual error is positive or negative.

V. ADDITIONAL ANALYSES

In this section we discuss three sets of results aimed at calibrating conclusions from our main analyses. First, we explore the robustness of our results to alternative measures of

managerial ability (i.e., historical returns and media citations). Second, we investigate whether earnings quality increases when a new CFO of superior ability is hired. Third, we investigate the sensitivity of our results to the inclusion of additional control variables in our models.

Alternate Managerial Ability Measures

Our main managerial ability measure is the managerial efficiency metric developed by Demerjian et al. (2012). In this section we investigate two additional ability measures: historical returns, following Fee and Hadlock (2003), and media citations, following Francis et al. (2008); definitions are provided in Panel C of Table 1.[21] We begin by examining the correlations among the variables (see Table 2). Managerial ability and historical returns are correlated at 0.23, consistent with these two variables measuring different aspects of "ability," while there is a *negative* correlation between media citations and both ability and historical returns. Consistent with historical returns and media citations containing a large firm component, they are correlated with firm size at 0.21 and 0.53, respectively, while managerial ability is not correlated with firm size. Interestingly, both ability and historical returns are negatively correlated with losses and positively correlated with future earnings; however, these associations do not extend to media citations. Generally, the correlations suggest that historical returns and our main managerial ability measure have the expected associations with perceptions of managerial ability.

To examine the association between earnings quality and managerial ability, we consider a composite measure of total earnings quality, which is the sum of (1) the rank of the innate portion of accruals quality (*Innate AQ*), (2) the rank of firm-specific earnings persistence, and (3) $-1 \times$ *Restate*.[22] Thus, the variable ranges from a low of negative one to a high of two. In Table 10, we consider the associations between total earnings quality and each of the three ability

[21] Following our examination of these alternate measures, we also examine manager fixed effects.
[22] We exclude the bad debt expense error as it severely limits the available observations.

measures.[23] Turning first to the Demerjian et al. (2012) measure, we see that more able managers have higher total earnings quality, as was the case with the individual components. Turning next to historical returns, we see that the greater the historical returns, the greater total earnings quality, consistent with our hypothesis. Our inferences remain unchanged if we use historical returns as an alternate ability measure in each of our tests in the paper (not tabulated), however, as previously noted, the Demerjian et al. ability score allows us to better separate the manager from the firm.

Media citations, however, are negatively associated with earnings quality. One difficulty in comparing results across measures is that media citations are available only for a small subset of our sample; thus we next consider all three measures simultaneously for the reduced sample. The coefficient on media citations remains negative, but becomes insignificant, while the coefficients on historical returns and managerial ability remain positive and significant in the reduced sample.

CFO-Specific Analysis

Although our results are similar using historical returns, both the Demerjian et al. (2012) ability score and historical returns likely contain a firm-specific element. To better abstract away from the firm, we consider herein how earnings quality changes across different CFO regimes. We first explore whether there are CFO fixed effects, following Dyreng et al. (2010) among others. We next explore whether the CFO's ability at their initial firm is associated with the accruals quality at their subsequent firm. Together, these analyses provide evidence on the CFO-specific effect on accruals quality.

[23] Results are similar if we consider the individual components of total earnings quality, with the exception that the relation between historical returns and firm-specific earnings persistence is not significant (not tabulated).

We identify 195 CFOs that switch firms among firms covered by Execucomp (where CFOs have specific identifiers) and are able to estimate CFO fixed effects for 88 of these executives across 170 firms. We estimate the following (not tabulated):

$$Total\ EarnQuality_{i,t} = \beta_0 + \sum_t \beta_t YEAR_t + \sum_i \beta_i FIRM_t + \sum_m \beta_m MANAGER_m + \varepsilon_{i,t} \quad (10)$$

The average manager fixed effect increases by 1.22 when moving from the lowest to the highest quartile of manager fixed effects. For comparison purposes, the average firm fixed effect increases by 2.00 when moving from the lowest to the highest quartile of firm fixed effects. Although fixed effects are quantifiable only for CFOs switching firms within our sample, clearly manager-specific effects are economically significant.[24]

We next investigate if the CFO's score from their first firm is associated with accruals quality at their subsequent firm. We expect firms that hire a more efficient CFO to experience an improvement in their earnings quality, and firms that hire a less efficient CFO to experience a decline in their earnings quality. Thus, using the sample of the 195 CFOs examined above who switched across our sample firms, we identify 116 with sufficient information to estimate the following:

$$\begin{aligned}\Delta AQ = {} & \beta_0 + \boldsymbol{\beta_1}\, \Delta \boldsymbol{MgrlAbility} + \beta_2\, \Delta Firm\ Size + \beta_3\, \Delta Losses + \beta_4\, \Delta Sales\ Volatilty \\ & + \beta_5 \Delta Cash\ Flow\ Volatility + \beta_6\, \Delta Operating\ Cycle + \beta_7 \Delta SalesGrowth_t + \\ & \beta_8 \Delta AbnormalReturn_t + \varepsilon \end{aligned} \quad (11)$$

where the change in earnings quality, as well as the change in each of the control variables, is measured from year AQ_{c+1}–AQ_{c-1}, where c is the year in which the CFO changed. Thus, a positive value of ΔAQ signifies an improvement in earnings quality following the new CFO appointment. The change in managerial ability reflects the difference between the newly appointed CFO's score from his or her prior firm and the departing CFO's score from the current

[24] Note that the Demerjian et al. (2012) managerial ability score is positively correlated with the CFO-specific fixed effects (not tabulated).

firm (i.e., $MgrlAbility_{j,b,c-1} - MgrlAbility_{i,a,c-1,}$ where manager *b* was hired by firm *i* and was previously employed by firm *j*). A positive value of $\Delta MgrlAbility$ signifies that the incoming manager is deemed more efficient than the outgoing manager. Thus, we expect β_1 to be positive**.** Turning to Table 11, we find a positive and significant coefficient on $\Delta MgrlAbility$, as expected. That the association between ability and earnings quality spans firms helps to alleviate the general concern that the associations documented herein are attributable to the firm, rather than the manager.

Additional Control Variables

We consider two infrastructure-related control variables that have been shown to be associated with earnings quality—governance (Klein 2002) and internal control quality (Doyle et al. 2007). We measure governance with the percentage of independent board members, obtained from IRRC from 1996–2007, ranked by year and industry (*PctInd*). We proxy for internal control quality with the disclosure of material weaknesses in internal control (*ICW*). We obtain internal control data from Doyle et al. (2007) for 2002–2004 and from Audit Analytics from 2005–2007.[25] We find qualitatively similar results to those reported when models include these two additional controls.

We also explore the sensitivity of our results to using abnormal performance variables other than the change in sales growth. We replace the change in sales growth with the level of sales growth and with historical three-year average change in sales growth; we find similar results to those reported.

[25] The Doyle et al. (2007) data is available at http://faculty.washington.edu/geweili/ICdata.html. We end the analysis in 2007 because of limitations in our board independence data.

VI. CONCLUSION

We examine the relation between managerial ability and earnings quality. While empirical literature in the area of earnings quality has largely focused on firm-specific characteristics, such as size and board independence (Dechow and Dichev 2002; Klein 2002), we examine manager-specific effects by using a measure of managerial ability presented by Demerjian et al. (2012). Our study is in the vein of Bertrand and Schoar (2003), who find that managers have an effect on firm choices such as acquisitions or research and development expenditures, and Francis et al. (2008), who find that earnings quality appears to vary with CEO reputation. Using four alternative earnings quality measures (restatements, earnings persistence, error in the bad debt provision and the estimation-related (innate) portion of accruals quality), we find that more able managers report higher quality earnings.

Our study contributes to the earnings quality and managerial ability literatures. We document a positive association between managerial ability and earnings quality. Considering the earnings quality metrics that management can impact (for example, forming the best estimates possible given the operating cycle or cash flow volatility of the firm), we find that higher quality managers are associated with higher quality earnings. This finding is consistent with the premise that the more capable the manager, the better able he or she is to estimate accruals, and it suggests that firms can improve their earnings quality by employing higher quality managers.

Our study is subject to limitations. First, as previously acknowledged, our evidence relies on proxies for both managerial ability and earnings quality. Although we attempt to control for correlated variables such as economic shocks, the possibility of correlated omitted variables remains. Second, the ability score we examine is for the entire management team, while our focus in on the effect of CFOs and their delegates. We mitigate this concern to some extent by

documenting economically significant CFO fixed effects on earnings quality—a methodology that does not rely on our managerial ability measure. We further corroborate our analysis by tracking CFOs across firms and documenting that hiring a higher-quality CFO is associated with an improvement in the firm's earnings quality. Finally, our focus is on accrual estimation, and as such we abstract away from the decision to manage earnings. Future researchers might explore the association between managerial ability and earnings management, and similarly, the inter-relations between ability and infrastructure choices that have been shown to improve earnings quality, such as governance and internal control quality.

REFERENCES

Aier, J., J. Comprix, M. Gunlock, and D. Lee. 2005. The financial expertise of CFOs and accounting restatements. *Accounting Horizons* 19 (3): 123–135.

Anderson, K., and T. Yohn. 2002. The effect of 10-K restatements on firm value, information asymmetries, and investors' reliance on earnings. Working paper, Georgetown.

Ashbaugh-Skaife, H., D. Collins, W. Kinney, and R. LaFond. 2008. Internal control deficiencies, remediation and accrual quality. *The Accounting Review* 83 (1): 217–250.

Baik, B., D. Farber, and S. Lee. 2012. CEO ability and management earnings forecasts. *Contemporary Accounting Research*, forthcoming.

Bamber, L., J. Jiang, and I. Wang. 2010. What's my style? The influence of top managers on voluntary corporate financial disclosure. *The Accounting Review 85 (4): 1131–1162.*

Barr, R., and T. Siems. 1997. Bank failure prediction using DEA to measure management quality. In: R. Barr, R. Helgason and J. Kennington, eds., Computer Science and Operations Research: Advances in Metaheuristics, Optimization and Stochastic Modeling Technologies (Boston, MA: Kluwer Acadmic Publishers).

Becker, C., M. DeFond, J. Jiambalvo, and K.R. Subramanyam. 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research* 15 (1): 1–24.

Bertrand, M., and A. Schoar. 2003. Managing with style: The effect of managers on firm policies. *The Quarterly Journal of Economics* 1169–1208.

Dechow, P., and I. Dichev. 2002. The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review* 77 (4): 35–59.

Dechow, P., W. Ge, and C. Schrand. 2010. Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics* 50: 344–401.

Dechow, P., and C. Schrand. 2004. *Earnings Quality*. Charlottesville, VA: The Research Foundation of CFA Institute.

Dechow, P., and D. Skinner. 2000. Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting Horizons* 14 (2): 235–250.

DeJong, D., and Z. Ling. 2010. Managers: Their effects on accruals and firm policies. Working paper, University of Iowa.

Demerjian, P., B. Lev, and S. McVay. 2012. Quantifying managerial ability: A new measure and validity tests. *Management Science*, forthcoming.

Doyle, J., W. Ge, and S. McVay. 2007. Accruals quality and internal control over financial reporting. *The Accounting Review* 82 (5): 1141–1170.

Dyreng, S., M. Hanlon, and E. Maydew. 2010. The effects of executives on corporate tax avoidance. *The Accounting Review* 85 (4): 1163–1189.

Fama, E., and K. French. 1997. Industry costs of equity. *Journal of Financial Economics* 43 (2): 153–193.

Fee, C., and C. Hadlock. 2003. Raids, rewards, and reputations in the market for managerial talent. *Review of Financial Studies* 16 (4): 1315–1357.

Feroz, E., K. Park, and V. Pastena. 1991. The financial and market effects of the SEC's accounting and auditing enforcement releases. *Journal of Accounting Research* 29 (3): 107–142.

Francis, J., R. LaFond, P. Olsson, and K. Schipper. 2004. Costs of equity and earnings attributes. *The Accounting Review* 79 (4): 967–1010.

Francis, J., A. Huang, S. Rajgopal, and A. Zang. 2008. CEO reputation and earnings quality. *Contemporary Accounting Research* 25 (1): 109–147.
Ge, W., D. Matsumoto and J. Zhang. 2011. Do CFOs have style? An empirical investigation of the effect of individual CFOs on accounting practices. *Contemporary Accounting Research* 28 (4): 1141–1179.
Hennes, K., A. Leone, and B. Miller. 2008. The importance of distinguishing errors from irregularities in restatement research: The case of restatements and CEO/CFO turnover. *The Accounting Review* 83 (6): 1487–1519.
Hribar, P., and C. Nichols. 2007. The use of unsigned earnings quality measures in tests of earnings management. *Journal of Accounting Research* 45 (5): 1017–1053.
Jackson, S. and X. Liu. 2010. The allowance for uncollectible accounts, conservatism, and earnings management. *Journal of Accounting Research* 48 (3): 565–601.
Klein, A. 2002. Audit committee, board of director characteristics and earnings management. *Journal of Accounting and Economics* 33 (3): 375–400.
LaFond, R. 2008. Discussion of 'CEO reputation and earnings quality.' *Contemporary Accounting Research* 25 (1): 149–156.
Lev, B., and T. Sougiannis. 1996. The capitalization, amortization, and value-relevance of R&D. *Journal of Accounting and Economics* 21 (1): 107–138.
Leverty, J., and M. Grace. 2011. Dupes or incompetents? An examination of management's impact on firm distress. *Journal of Risk and Insurance*, forthcoming.
Lipe, R. 1990. The relation between stock returns and accounting earnings given alternative information. *The Accounting Review* 65 (1): 49–71.
McNichols, M. 2002. Discussion of the quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review* 77 (4): 61–69.
McNichols, M., and P. Wilson. 1988. Evidence of earnings management from the provision for bad debts. *Journal of Accounting Research* 26 (Supplement): 1–31.
Milbourn, T. 2003. CEO reputation and stock-based compensation. *Journal of Financial Economics* 68: 233–262.
Palmrose, Z.V., V. Richardson, and S. Shultz. 2004. Determinants of market reactions to restatement announcements. *Journal of Accounting and Economics* 37 (1): 59–89.
Palmrose, Z.V., and S. Shultz. 2004. The circumstances and legal consequences of non-GAAP reporting: Evidence from restatements. *Contemporary Accounting Research* 21 (1): 139–180.
Penman, S. 2001. *Financial Statement Analysis and Security Valuation*. New York, NY: McGraw-Hill, Irwin.
Petersen, M. 2009. Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies* 22 (1): 435–480.
Plumlee, M., and T. Yohn. 2010. An analysis of the underlying causes attributed to restatements. Accounting Horizons 24 (1): 41–64.
Revsine, L., D. Collins, and W. Johnson. 2002. *Financial Reporting and Analysis*. Upper Saddle River, NJ: Prentice Hall.
Schipper, K., and L. Vincent. 2003. Earnings quality. *Accounting Horizons* 17 (Supplement): 97–110.

APPENDIX

Estimation of Total Firm Efficiency (from Demerjian et al. 2012)

Our main measure of managerial ability is the metric developed by Demerjian et al. (2012). They use data envelopment analysis (DEA), a non-linear optimization program that calculates unit-specific relative efficiency. The program is as follows:

$$\max_{v,u} \theta = \frac{\sum_{i=1}^{s} u_i y_{ik}}{\sum_{j=1}^{m} v_j x_{jk}} \quad \text{(A1)}$$

Subject to: $$\frac{\sum_{i=1}^{s} u_i y_{ik}}{\sum_{j=1}^{m} v_j x_{jk}} \leq 1 \ (k = 1,\ldots,n) \quad \text{(A2)}$$

$$v_1, v_2, \ldots v_m \geq 0 \quad \text{(A3)}$$

$$u_1, u_2, \ldots, u_s \geq 0 \quad \text{(A4)}$$

DEA measures the efficiency of a single unit (in our case firm) *k* relative to a set of comparable firms. The objective function measures efficiency as the weighted outputs scaled by the weighted inputs. There are *s* outputs and *m* inputs, indexed by *i* and *j* respectively. The quantities of each output *i* and input *j* for firm *k* are y_{ik} and x_{jk}. The optimization program maximizes A1 by selecting the weights on each output (u_i) and input (v_j). The vectors of weights on the outputs ($\boldsymbol{u}$) and inputs ($\boldsymbol{v}$) are termed implicit weights. Efficiency is based on the level of the weighted outputs to the level of the weighted inputs. The most efficient firms have the highest level of outputs for a fixed level of inputs (or equivalently, the lowest level of inputs for a fixed level of outputs). DEA calculates a unique set of implicit weights for each firm *k*.

The first constraint, A2, scales the implicit weights so that the most efficient firm (or firms) has (have) an efficiency value of one. The optimal weights for each firm *k* are tested for all the other comparable firms ($1,\ldots n; \neq k$). This calculates what the efficiency would be for each comparable firm under the implicit weights calculated in A1 for firm *k*, allowing for the determination of relative efficiency. Constraints A3 and A4 require implicit weights to be non-negative, which prevents solutions calling for negative input levels.

Total firm efficiency is estimated using a single output and seven inputs. Total revenue ("SALE") is the output, as the principal objective of the firm is to produce sales. The most successful firms are those that produce the maximum sales at the lowest cost. The cost of producing the sales is captured by the seven inputs. The first five correspond to assets the company invests in that are expected to affect their revenue generation. Demerjian et al. consider the beginning of period balance for each of these assets, since managers' past decisions regarding these assets are expected to affect current period revenues.

1. Net Property, Plant and Equipment (PP&E; "PPENT").

2. Capitalized Operating Leases. The discounted present value of the next five years of required operating lease payments (available in the firm's footnotes to the financial statements and on Compustat).[26] The inclusion of Net Operating Leases as an input increases the input comparability among firms that effectively have the same operations, but either lease or buy their revenue-generating equipment.

3. Net Research and Development (R&D). To calculate net R&D, which is not reported as an asset on the balance sheet, Demerjian et al. follow Lev and Sougiannis (1996), who use a five-year capitalization period of R&D expense ("XRD"), where the net value (net of amortization) is: $RD_{cap} = \sum_{t=-4}^{0}(1 + 0.2t) \times RD_{exp}$. Thus, for example, R&D expenditures from five years back receive a weight of .2 (they were already amortized 80%), four years back a weight of .4 (amortized 60%), etc., with the prior year's R&D ($t = -1$) receiving full weight.

4. Purchased goodwill, reported on the balance sheet, which is the premium paid over the fair value of a business acquisition ("GDWL"). Goodwill generally reflects the value of the acquired intangible assets.

5. Other acquired and capitalized intangibles ("INTAN" less "GDWL"), also reported on the balance sheet, which includes items such as client lists, patent costs and copyrights.

They also include two year t expenses: Cost of Goods Sold and Selling General and Administrative Expense to account for the cost of inventory (Cost of Goods Sold) and sales

[26] Demerjian et al. use a discount rate of 10 percent per year. Data items for the five lease obligations are "MRC1–MRC5." They note that they would also like to discount the "thereafter" payments; however, this line item was not collected by Compustat for the bulk of the sample period. Note that capital leases are included in Net PP&E.

generated from advertising and the quality of the sales force (advertising, training costs and IT services are included in SG&A).

They estimate DEA efficiency by industry (based on Fama and French 1997) to increase the likelihood that the peer firms have similar business models and cost structures within the estimations. The resulting score ranges from 0.0002 to one, with one being the optimal output for a given mix of inputs.

Using DEA instead of traditional ratio analysis has several advantages. First, DEA allows the weightings on each of the inputs to vary, whereas traditional efficiency ratios restrict all weightings to be equal to one. For example, within DEA, a dollar at historical cost (i.e., PPE) can count differently than a dollar at or near replacement cost (i.e., COGS), but both are weighted identically in a traditional efficiency ratio. Second, DEA compares each firm within an industry to the most efficient firm, whereas traditional efficiency analysis compares each firm to the mean or median firm. See Demerjian et al. for additional information, explicit comparisons of this score with a residual from an OLS regression, and a comparison of variable ratios, such as return on assets.

Table 1
Descriptive Statistics

Panel A – Descriptive Statistics for the Full Sample (1989–2009)

Variable	N	Mean	Median	Standard Dev.	25%	75%
MgrlAbility♦	78,423	0.00	–0.01	0.15	–0.09	0.07
Historical Ret♦	40,871	0.06	–0.35	2.17	–1.00	0.50
Media Citations♦	10,110	219.11	93.00	693.55	46.00	180.00
Restate	46,022	0.13	0.00	0.33	0.00	0.00
F.S. EarnPer	68,447	0.23	0.18	0.40	–0.02	0.48
BDE Error	1,124	0.01	0.01	0.05	0.00	0.01
Aggregate AQ♦	51,925	–0.03	–0.03	0.03	–0.05	–0.01
Annual AQ♦	78,423	–0.06	–0.03	0.06	–0.07	–0.01
Total EarnQuality	19,585	0.88	0.89	0.55	0.56	1.22
ΔWC	78,423	0.08	0.04	0.12	0.02	0.09
CFO	78,423	–0.01	0.06	0.32	–0.03	0.13
Firm Size♦	78,423	1,134.66	84.80	4,645.46	17.92	423.29
Losses	73,231	0.40	0.33	0.37	0.00	0.80
SalesVolatility	68,152	0.23	0.16	0.23	0.09	0.30
CashFlowVolatility	65,641	0.10	0.06	0.14	0.04	0.12
OperCycle♦	77,444	158.72	112.65	281.68	68.01	174.53
ΔSalesGrowth	67,849	–0.05	0.00	3.14	–0.15	0.31
AbnormalRet	62,928	0.02	–0.11	0.73	–0.39	0.23
FutureEarnings	78,423	–0.12	0.02	0.73	–0.10	0.08
PctInd	9,290	0.64	0.67	0.18	0.53	0.77
ICW	50,651	0.15	0.00	0.35	0.00	0.00

Panel B – Accruals Quality Variables by Managerial Ability

	Lowest Quintile of *MgrlAbility*		Highest Quintile of *MgrlAbility*		Diff.	Diff.
Variable	Mean	Median	Mean	Median	Mean	Med.
MgrlAbility♦	–0.18	–0.17	0.20	0.18	***	***
Historical Ret♦	–0.42	–0.65	0.79	0.09	***	***
Media Citations♦	278.48	107.00	151.07	79.00	***	***
Restate	0.14	0.00	0.12	0.00	***	***
F.S. EarnPer	0.21	0.15	0.25	0.20		***
BDE Error	0.02	0.01	0.00	0.01	***	***
Aggregate AQ♦	–0.06	–0.025	–0.04	–0.028	***	***
Annual AQ♦	–0.05	–0.03	–0.07	–0.04	***	***
Total EarnQuality	0.79	0.88	0.91	1.00	***	***

♦ For each of our transformed variables (*MgrlAbility, Historical Ret, Media Citations, Aggregate AQ, Annual AQ, Firm Size,* and *Operating Cycle*), we present the untransformed variable for ease of interpretation.

Panel C: Variable Definitions

Variable	*Description*	*Definition*
		Ability Measures
MgrlAbility	*Managerial Ability*	The decile rank (by industry and year) of managerial efficiency from Demerjian et al. (2012) in year *t*; the residual from Equation (1); see also the appendix.
Historical Ret	*Historical Return*	The decile rank (by industry and year) of the 5-year past value-weighted industry-adjusted return (year *t*–4 to *t*) using monthly CRSP data.
Media Citations	*Media Citations*	The decile rank (by industry and year) of the number of articles mentioning the CEO over the preceding five year period (year *t*–4 to *t*).
		Earnings Quality Measures
Restate	*Restatement*	An indicator variable that is equal to one if the firm announced a restatement in years *t*+1, *t*+2, or *t*+3, and zero otherwise (available from 1997–2009).
Restate Judgments	*Restatement relating to judgments and estimates*	An indicator variable that is equal to one if the firm announced a restatement in years *t*+1, *t*+2, or *t*+3 classified as *standard-based* or *complexity-based* per Plumlee and Yohn (2010), and zero otherwise (available from 2003–2006). Standards-based restatements are one of three types: 1) restatements stemming from lack of clarity in the standard, 2) restatements resulting from mistakes in judgment, and 3) restatements stemming from errors in applying complex rules. Complexity-based restatements are those resulting from complexity of a transaction.
Restate Other	*Restatement relating to items other than judgment*	An indicator variable that is equal to one if the firm announced a restatement in years *t*+1, *t*+2, or *t*+3 not classified as a restatement relating to judgments and estimates as defined above, per Plumlee and Yohn (2010), and zero otherwise (available from 2003–2006).
F.S. EarnPer	*Firm-Specific Earnings Persistence*	The firm-specific time-series coefficient on earnings (per share) in a regression of one-quarter forward earnings on current-quarter earnings. We estimate firm-specific quarterly earnings persistence over years *t*+1 through year *t+4*.
BDE Error	*Unexplained Bad Debt Expense*	The absolute value of the residual (ϕ_t) from Equation (5), estimated by industry, where three industries are considered: printing and publishing, nondurable wholesale goods, and business services.
Aggregate AQ	*Aggregate Std Dev of Accruals Quality*	The decile rank (by industry and year) of $-1 \times$ Standard Deviation (ε_{t+1}, ε_{t+2}, ε_{t+3}, ε_{t+4}), where ε_{t+n} is the residual from Equation (7) estimated by industry-year, where industries are defined per Fama and French (1997).
Annual AQ	*Annual Accruals Quality*	The decile rank (by industry and year) of $-1 \times |\varepsilon_{t+1}|$, where ε_{t+1} is the residual from Equation (7) estimated by industry-year, where industries are defined per Fama and French (1997).

Total Earn Quality	*Earnings Quality Summation Variable*	The sum of three earnings quality variables: (1) the rank of the estimation portion of accruals quality ($\widehat{Innate}$), (2) the rank of firm-specific earnings persistence, and (3) –1 × *Restate*. Thus, the variable ranges from a low of negative one to a high of two.
	Control Variables	
Firm Size	*Firm Size*	The natural log of the firm's assets (AT) reported at the end of year *t*.
Sales Volatility	*Sales Volatility*	The standard deviation of [sales (SALE) / average assets (AT)] over at least three of the last five years (*t*–4, *t*).
Cash Flow Volatility	*Cash Flow Volatility*	The standard deviation of [cash from operations (OANCF) / average assets (AT)] over at least three of the last five years (*t*–4, *t*).
OperCycle	*Operating Cycle*	The natural log of the length of the firm's operating cycle, defined as sales turnover plus days in inventory [(SALE/360)/(average RECT) + (COGS/360)/(average INVT)] and is averaged over at least three of the last five years (*t*–4, *t*).
Losses	*Loss History*	The percentage of years reporting losses in net income (IBC) over at least three of the last five years (*t*–4, *t*).
National Auditor	*National Auditor Indicator*	An indicator variable set equal to one for firms audited by national audit firms in year *t*; zero otherwise.
ΔSales Growth	*One-year Change in %Sales Growth*	The one-year change in sales growth defined as current year's sales growth ($\Delta SALE_t / SALE_{t-1}$) less prior year's sales growth ($\Delta SALE_{t-1} / SALE_{t-2}$).
Abnormal Returns	*Abnormal Return*	One-year market-adjusted buy-and-hold return for year *t* where market-returns are value weighted.
PctInd	*Board Independence*	The percentage of board members classified as independent based on IRRC's classification (available from 1996–2007).
ICW	*Internal Control Weakness*	An indicator variable for firms reporting material weaknesses in internal control (available from 2002–2007).
	Other Variables	
Future Earnings	*Future Net Income*	Future Earnings (IBC) scaled by average total assets (AT).
Earnings	*Net Income*	Earnings (IBC) scaled by average total assets (AT).
ΔWC	*Change in Working Capital Accruals*	The change in working capital scaled by average total assets, where working capital is defined as follows: [– (RECCH + INVCH + APALCH + TXACH + AOLOCH)].
ΔREV	*Change in Sales*	Current year change in sales (SALE) scaled by average total assets (AT).
PPE	*Property, Plant and Equipment*	Current year level of property, plant, and equipment (PPENT) scaled by average total assets (AT).
CFO	*Cash From Operations*	Cash from operations (OANCF) scaled by average total assets (AT).
Accruals	*Accruals*	Accruals (scaled by average total assets (AT)), where Accruals = Earnings – CFO.

Notes: *, **, *** denotes a difference in the mean (median) under a *t*-test (Chi-Square test) with a two-tailed p-value of less than 0.10, 0.05, and 0.01, respectively (Panel B). All continuous variables are winsorized at the extreme 1%.

Table 2
Univariate Correlations

	Mgrl Ability	*Hist Ret*	*Media Count*	*Rest*	*F.S. Per*	*BDE Error*	*Agg AQ*	*Ann AQ*	*Total EQ*	*Firm Size*	*Losses*	*Fut Earn*
MgrlAbility		**0.23**	**–0.10**	**–0.02**	**0.04**	**–0.16**	**–0.03**	**–0.06**	**0.07**	0.00	**–0.22**	**0.27**
Historical Ret	**0.24**		–0.02	**–0.03**	**0.13**	**–0.14**	**0.13**	**0.08**	**0.22**	**0.21**	**–0.44**	**0.41**
Media Citations	**–0.10**	–0.01		0.00	**–0.10**	**0.11**	**0.09**	**0.06**	**0.05**	**0.53**	0.02	–0.10
Restate	**–0.02**	**–0.03**	0.01		**–0.03**	–0.01	0.00	**–0.02**	**–0.49**	**0.07**	**0.02**	**–0.02**
F.S. EarnPer	**0.04**	**0.13**	**–0.10**	**–0.03**		**0.08**	**0.01**	0.00	**0.62**	**0.02**	**–0.08**	**0.12**
BDE Error	**–0.22**	**–0.05**	**–0.02**	**–0.02**	0.01		–0.03	–0.02	–0.06	–0.02	0.19	–0.11
Aggregate AQ	**–0.03**	**0.14**	**0.09**	0.00	**0.01**	-0.01		**0.45**	**0.33**	**0.39**	**–0.31**	**0.21**
Annual AQ	**–0.06**	**0.08**	**0.06**	**–0.02**	0.00	**–0.06**	**0.46**		**0.20**	**0.32**	**–0.23**	**0.15**
Total EarnQuality	**0.07**	**0.21**	**0.05**	**–0.58**	**0.59**	**–0.05**	**0.31**	**0.19**		**0.35**	**–0.29**	**0.28**
Firm Size	**–0.03**	**0.06**	**0.38**	0.00	0.00	**–0.20**	**0.17**	**0.12**	**0.17**		**–0.44**	**0.30**
Losses	**–0.21**	**–0.43**	0.00	0.01	**–0.06**	**0.31**	**–0.31**	**–0.23**	**–0.27**	**–0.15**		**–0.56**
FutureEarnings	**0.08**	**0.26**	–0.02	–0.01	**0.03**	**–0.17**	**0.18**	**0.16**	**0.14**	**0.05**	**–0.32**	

Notes: This table reports Pearson correlation coefficients below the diagonal and Spearman correlation coefficients above the diagonal. See Table 1, Panel C for variable definitions. We decile rank *MgrlAbility, Historical Ret, Media Citations, F.S.EarnPer, Aggregate AQ,* and *Annual AQ* by industry-year. We denote significant correlation coefficients at the one percent alpha level with bold font.

Table 3
Restatements and Managerial Ability

$$Restate_{t+1,t+3} = \alpha_0 + \boldsymbol{\alpha_1 MgrlAbility_t} + \alpha_2 Firm\ Size_t + \alpha_3 SalesVolatility_{t-4,t} + \alpha_4 CashFlowVolatility_{t-4,t} + \alpha_5 OperCycle_{t-4,t} + \alpha_6 Losses_{t-4,t} + \alpha_7 NationalAuditor_t + \alpha_8 \Delta SalesGrowth_t + \alpha_9 AbnormalReturn_t + \varepsilon_{t+1}$$

		Dependent Variable =			
	Pred.	*Restate*	*Restate*	*Restate Judgments*	*Restate Other*
MgrlAbility	–	–0.21**	–0.22**	–0.50**	–0.13
		–2.09	*–2.12*	*–2.19*	*–1.07*
Firm Size	+	0.13***	0.47***	–0.06	–0.02
		3.73	*10.95*	*1.23*	*0.42*
SalesVolatility	+	0.21*	–0.26	–0.04	0.80***
		1.63	*–1.57*	*–0.18*	*3.41*
CashFlowVolatility	+	0.09	–0.32	0.81*	–0.37
		0.26	*0.82*	*1.80*	*0.97*
OperCycle	+	–0.08*	–0.09	–0.22***	0.11**
		–1.66	*–1.15*	*–3.02*	*2.03*
Losses	+	0.31***	0.31***	0.00	0.31***
		3.38	*2.71*	*0.01*	*2.67*
NationalAuditor	–	–0.23	–0.09	0.43	0.23
		–1.57	*–0.98*	*1.63*	*0.92*
ΔSalesGrowth	?	0.00	0.00	0.00	0.01
		0.54	*0.25*	*0.01*	*0.94*
AbnormalReturn	?	0.05	0.03	0.08	0.00
		0.88	*1.22*	*1.00*	*0.11*
Restatement Obs		4,453	4,453	1,104	1,393
Total Observations		33,035	12,054	10,568	10,568
Pseudo R^2		1.00%	n.a.	1.20%	0.86%
Firm Fixed Effects		Excluded	Included	Excluded	Excluded

Notes: This table reports the results from the logistic regression of earnings restatements on managerial ability and controls for innate firm characteristics. *Z-statistics* are presented below the coefficients and are based on standard errors that are clustered by firm and year for specifications excluding firm fixed effects. We decile rank *MgrlAbility* by industry-year. Intercept is included, but not tabulated. See Table 1, Panel C for variable definitions.
*, **, *** denotes a two-tailed p-value of less than 0.10, 0.05, and 0.01, respectively.

Table 4
Earnings Persistence and Managerial Ability

$$Earnings_{t+1,t+n} = \alpha_0 + \alpha_1\, Earnings_t + \alpha_2\, \boldsymbol{Earnings_t \times MgrlAbility_t} + \alpha_3 MgrlAbility_t + \alpha_4 Firm\ Size_t + \alpha_5 SalesVolatility_{t-4,t} + \alpha_6 CashFlowVolatility_{t-4,t} + \alpha_7 OperCycle_{t-4,t} + \alpha_8 Losses_{t-4,t} + \alpha_9 NationalAuditor_t + \alpha_{10} \Delta SalesGrowth_t + \alpha_{11} AbnormalReturn_t + \varepsilon_{t+1,\,t+n}$$

		Dependent Variable =					
	Pred.	*Future Earnings$_{t+1}$*			*Average Future Earnings$_{t+1,t+3}$*		
Earnings	+	0.30***			0.25***		
		9.01			*6.81*		
Earnings × MgrlAbility	+	0.36***			0.09*		
		7.90			*1.74*		
Accruals	+		0.36***	0.23***		0.31***	0.24***
			5.18	*6.64*		*4.99*	*6.25*
Accruals × MgrlAbility	+		0.42***	0.35***		0.41***	0.03
			6.55	*7.14*		*4.71*	*0.51*
CFO	+		0.69***	0.45***		0.62***	0.30***
			12.63	*12.36*		*7.52*	*7.37*
CFO× MgrlAbility	+		0.26***	0.26***		0.28***	0.08
			5.01	*5.46*		*2.84*	*1.57*
MgrlAbility	?	–0.01**	0.00	0.00	0.00	0.00	0.00
		–2.01	*0.66*	*0.49*	*0.01*	*0.62*	*0.13*
Total Observations		33,735	33,735	33,735	28,016	28,016	28,016
R^2		2.07%	15.96%	3.11%	0.07%	10.20%	0.01%
Test (F-statistic): *Accruals × MgrlAbility = CFO × MgrlAbility*			*5.62***	*7.04****		*2.66**	*2.41*
Firm Fixed Effects		Included	Excluded	Included	Included	Excluded	Included

Notes: This table presents the OLS regression results investigating the relation between managerial ability and earnings persistence for firms with positive earnings in year *t*. *t*-statistics are presented below the coefficients and are based on standard errors that are clustered by firm and year in specifications excluding firm fixed effects. We decile rank *MgrlAbility* by industry-year. Our main set of control variables (*Firm Size*, *Sales Volatility*, *Cash Flow Volatility*, *OperCycle*, *Losses, ΔSalesGrowth, AbnormalReturn, and NationalAuditor*) are included in the model. For succinctness, however, results for the control variables are not tabulated. Intercept is included, but not tabulated. See Table 1, Panel C for variable definitions. *, **, *** denotes a two-tailed p-value of less than 0.10, 0.05, and 0.01, respectively.

Table 5
Errors in the Allowance for Bad Debt and Managerial Ability

$$BDE\ Error_{t+1} = \beta_0 + \boldsymbol{\beta_1}\ \boldsymbol{High\ Ability\ Indicator_t} + \beta_2\ Firm\ Size_t + \beta_3\ Losses_t + \beta_4\ Sales\ Volatilty_t + \beta_5\ Cash\ Flow\ Volatility_t + \beta_6\ Operating\ Cycle_t + \beta_7\ NationalAuditor_t + \beta_8\ \Delta SalesGrowth_t + \beta_9\ AbnormalReturn_t + \varepsilon_{t+1}$$

		Dependent Variable =
	Prediction	*BDE Error*
High Ability Indicator	–	–0.01***
		–2.77
Firm Size	+	0.00
		1.13
SalesVolatility	+	0.00
		1.25
CashFlowVolatility	+	0.02*
		1.65
OperCycle	+	0.01
		1.74
Losses	+	0.01***
		4.24
NationalAuditor	–	0.00
		0.60
ΔSalesGrowth	+	0.00
		1.32
AbnormalReturn	+	0.00
		1.12
Total Observations		838
R^2		9.00%

Notes: This table presents the OLS regression results investigating the relation between managerial ability and errors in the bad debt provision. *t-statistics* are presented below the coefficients (we do not cluster by firm and year or include firm fixed effects because we do not have a sufficient number of same-firm observations). *BDE Error* is the absolute value of the residual from Equation (5), and *High Ability Indicator* is an indicator variable that is equal to one (zero) if the managerial ability score in year *t* is in the top (bottom) quintile relative to industry-year peers. Requisite information for this test requires hand collection from SEC filings. Thus, we limit the analysis to firms in three industries (following McNichols and Wilson 1988) where accounts receivable (relative to assets) and bad debt expense (relative to earnings) are large: (1) printing and publishing, (2) nondurable wholesale goods, and (3) business services. We consider only those firm-year observations where managerial ability falls among the highest and lowest quintile relative to industry-year peers. Intercept is included, but not tabulated. See Table 1, Panel C for variable definitions.
*, **, *** denotes a two-tailed p-value of less than 0.10, 0.05, and 0.01, respectively.

Table 6
Accruals Quality and Managerial Ability

$$AccrualsQuality_{t+1,t+n} = \alpha_0 + \alpha_1 MgrlAbility_t + \alpha_2 Firm\ Size_t + \alpha_3 SalesVolatility_{t-4,t} + \alpha_4 CashFlowVolatility_{t-4,t} + \alpha_5 OperCycle_{t-4,t} + \alpha_6 Losses_{t-4,t} + \alpha_7 NationalAuditor_t + \alpha_8 \Delta SalesGrowth_t + \alpha_9 AbnormalReturn_t + \varepsilon_{t+1,t+n}$$

		Dependent Variable =			
	Prediction	*Aggregate AQ*		*Annual AQ*	
MgrlAbility	+	–0.03***	0.00	–0.04***	–0.01*
		–3.39	*0.52*	*–5.80*	*–1.67*
Firm Size	+	0.04***	0.02***	0.02***	0.03***
		17.11	*7.63*	*4.64*	*14.73*
SalesVolatility	–	–0.14***	0.05***	–0.09***	0.01
		–8.53	*4.48*	*–9.23*	*1.35*
CashFlowVolatility	–	–0.42***	0.15***	–0.35***	–0.07***
		–8.08	*4.94*	*–8.59*	*–2.50*
OperCycle	–	0.00	0.00	–0.01**	0.01**
		0.04	*0.13*	*–2.35*	*2.35*
Losses	–	–0.11***	–0.04***	–0.07***	–0.04***
		–8.17	*–4.56*	*–8.83*	*–5.19*
NationalAuditor	+	0.02***	0.02***	0.02***	0.02***
		2.66	*3.28*	*3.42*	*2.51*
ΔSalesGrowth	–	–0.01*	0.00	0.00	0.01*
		–1.64	*0.15*	*0.87*	*1.64*
AbnormalReturn	–	0.01***	0.00	0.51***	0.00
		4.57	*0.83*	*24.69*	*1.32*
Total Observations		31,957		47,115	
R^2		18.93%	9.83%	8.77%	7.07%
Firm Fixed Effects		Excluded	Included	Excluded	Included

Notes: This table reports the results from the OLS regression of accruals quality on managerial ability and controls for innate firm characteristics. *t-statistics* are presented below the coefficients and are based on standard errors that are clustered by firm and year in specifications excluding firm fixed effects. We decile rank *MgrlAbility, Aggregate AQ,* and *Annual AQ* by industry-year. Intercept is included, but not tabulated. See Table 1, Panel C for variable definitions.
*, **, *** denotes a two-tailed p-value of less than 0.10, 0.05, and 0.01, respectively.

Table 7
Accruals Quality Components and Managerial Ability

$$AQ\ Component_{t+1,t+n} = \alpha_0 + \boldsymbol{\alpha_1 MgrlAbility_t} + \alpha_2 Firm\ Size_{t-1} + \alpha_3 NationalAuditor_t + \alpha_4 \Delta SalesGrowth_t + \alpha_5 AbnormalReturn_t + \varepsilon_{t+1,t+n}$$

		Aggregate AQ				Annual AQ			
	Pred.	$\widehat{Innate}$	$\hat{\varepsilon}$	$\widehat{Innate}$	$\hat{\varepsilon}$	$\widehat{Innate}$	$\hat{\varepsilon}$	$\widehat{Innate}$	$\hat{\varepsilon}$
MgrlAbility	+	0.05***	–0.05***	0.03***	–0.02***	0.05***	–0.05***	0.06***	–0.03***
		5.01	*–4.91*	*6.50*	*–2.74*	*6.85*	*–7.85*	*18.64*	*–3.96*
FirmSize	+	0.09***	–0.02***	0.02***	–0.01***	0.10***	–0.03***	0.06***	–0.01***
		41.57	*–13.11*	*10.24*	*–3.44*	*40.75*	*–18.90*	*56.54*	*–5.59*
NationalAuditor	+	0.02**	0.02***	0.02***	0.00	0.04***	0.00	0.02***	0.00
		1.97	*2.65*	*3.30*	*0.84*	*4.30*	*0.84*	*7.43*	*0.28*
ΔSalesGrowth	–	0.00	0.00	0.00	0.00	0.01***	0.00	0.01***	0.00
		0.76	*0.83*	*0.46*	*0.65*	*2.49*	*1.04*	*2.56*	*0.76*
AbnormalReturn	–	0.02***	0.00	0.01***	0.00	0.02***	0.00	0.01***	0.00
		3.49	*0.45*	*3.38*	*1.25*	*2.87*	*0.53*	*7.40*	*0.01*
Total Observations		31,890	31,890	31,890	31,890	47,071	47,071	47,071	47,071
R^2		38.65%	2.01%	37.17%	1.99%	52.42%	3.93%	52.19%	3.89%
Firm Fixed Effects		Excluded	Excluded	Included	Included	Excluded	Excluded	Included	Included

Notes: This table presents the results of the OLS regression investigating the relation between accruals quality components and managerial ability. *t-statistics* are presented below the coefficient and are based on standard errors that are clustered by firm and year for specifications excluding firm fixed effects. We partition accruals quality metrics into "innate," "and the "unexplained" portion. Specifically, we estimate the following: $AQ = \beta_0 + \beta_1\ Firm\ Size + \beta_2\ Losses + \beta_3\ Sales\ Volatility + \beta_4\ Cash\ Flow\ Volatility + \beta_5\ Operating\ Cycle_t + \varepsilon_t$. The predicted values generated by applying $\beta_0 - \beta_5$ to the firm's characteristics provide our estimate of accruals quality related to estimation constraints ($\widehat{Innate}$). The residual is the "unexplained" portion of accruals quality ($\hat{\varepsilon}$). We exclude the controls for innate firm characteristics that make it difficult to estimate accruals from this table because we use the control variables in the partitioning of total accruals. We decile rank *MgrlAbility* and each of the AQ components by industry-year. Intercept is included, but not tabulated. See Panel C of Table 1 for additional variable definitions.
*, **, *** denotes a two-tailed p-value of less than 0.10, 0.05, and 0.01, respectively.

Table 8
Restatements and Accruals Quality Components

$$Restate_{t+1,t+3} = \alpha_0 + \boldsymbol{\alpha_1 Accruals\ Quality\ Component_t} + \alpha_2 Firm\ Size_t + \alpha_3 NationalAuditor_t + \alpha_4 \Delta SalesGrowth_t + \alpha_5 AbnormalReturn_t + \varepsilon_{t+1,\,t+3}$$

	Pred.	**Dependent Variable =** *Restate*			
Innate AQ	–	–1.06***	–1.10***	–0.91***	–0.49***
		–6.96	*–5.16*	*–5.70*	*–2.65*
Discretionary AQ	*?*	–0.13	–0.34***	–0.15**	–0.21***
		–1.38	*–2.58*	*–2.09*	*–2.60*
Firm Size	+	0.24***	0.89***	0.20***	0.51***
		8.72	*12.17*	*5.51*	*11.33*
NationalAuditor	–	0.00	–0.75***	–0.17	–0.28***
		0.03	*–4.07*	*–1.08*	*–2.74*
ΔSalesGrowth	n.s	0.01	0.02	0.00	0.02
		0.61	*0.71*	*1.23*	*1.09*
AbnormalReturn	n.s	0.09	0.12***	0.08	0.11***
		1.56	*3.22*	*1.50*	*3.71*
Accruals Quality =		Aggregate		Annual	
Total Observations		17,256	5,294	28,350	10,490
Pseudo R^2		2.09%	n.a.	1.14%	n.a.
Fixed Effects		Excluded	Included	Excluded	Included
Test (χ^2-statistic):					
Innate AQ = Discretionary AQ		*29.20****	*10.14****	*25.52****	*2.14**

Notes: This table reports the results from the logistic regression of earnings restatements on accruals quality components and controls. *Z-statistics* are presented below the coefficient and are based on standard errors that are clustered by firm and year for specifications excluding firm fixed effects. We decile rank *MgrlAbility* and *Accruals Quality Components* by industry-year. Intercept is included, but not tabulated. See Table 1, Panel C for variable definitions.
*, **, *** denotes a two-tailed p-value of less than 0.10, 0.05, and 0.01, respectively.

Table 9
Annual accrual errors and Managerial Ability by positive and negative annual accrual errors

$$\textit{Annual AQ Error}_{t+1} = \alpha_0 + \boldsymbol{\alpha_1 MgrlAbility_t} + \alpha_2 FirmSize_t + \alpha_3 SalesVolatility_{t-4,t} + \alpha_4 CashFlowVolatility_{t-4,t} + \alpha_5 OperCycle_{t-4,t} + \alpha_6 Losses_{t-4,t} + \alpha_7 NationalAuditor_t + \alpha_8 \Delta SalesGrowth_t + \alpha_9 AbnormalReturn_t + \varepsilon_{t+1}$$

		Dependent Variable =					
		Innate Portion of Annual AQ Error$_{t+1}$		*Discretionary Portion of Annual AQ Error$_{t+1}$*			
	Pred.	Positive Error	|Negative Error|	Positive Error	|Negative Error|	Positive Error	|Negative Error|
MgrlAbility$_t$	–	–0.06***	–0.05***	0.06***	–0.01	0.08***	–0.01
		–12.51	*–12.08*	*5.97*	*–0.77*	*6.68*	*–0.63*
Firm Size$_{t \text{ or } t-1}$	–	–0.06***	–0.06***	0.01**	–0.02***	0.01**	0.02***
		–38.49	*–36.86*	*2.39*	*–6.57*	*2.33*	*5.64*
NationalAuditor$_t$	–	–0.02***	–0.03***	0.00	0.00	–0.03**	0.02
		–3.99	*–6.88*	*0.70*	*0.35*	*–2.17*	*1.38*
ΔSalesGrowth$_t$	+	–0.00	0.00	0.00	0.00	0.00	0.00
		–1.48	*1.14*	*1.59*	*0.07*	*1.05*	*0.20*
AbnormalReturn$_t$	+	–0.007***	–0.005***	0.00	–0.01*	0.01*	–0.01**
		–5.34	*–3.18*	*0.77*	*–1.93*	*1.94*	*–2.30*
AbnormalReturn$_{t+1}$	+					0.02***	0.00
						5.36	*0.77*
Future R&D$_{stdev}$	+					0.51***	0.19
						4.73	*1.57*
Total Observations		24,376	22,695	24,376	22,695	18,600	17,112
R^2		50.55	53.81%	2.64%	4.05%	2.07%	5.54%
Firm Fixed Effects		Included	Included	Included	Included	Included	Included

Notes: This table presents the OLS regression results investigating the relation between managerial ability and the annual accrual error, i.e., the error from the Dechow/Dichev accruals model (equation (6) of the paper). For ease of interpretation, when the annual accrual error is negative, we use the absolute value of the accrual error as the dependent variable. Thus, for positive and negative residuals, lower values correspond to more accurate accruals estimates (errors closer to zero). We examine the relation between managerial ability and accruals quality separately for firm years where the signed residual from the Dechow/Dichev model is positive (i.e., greater than or equal to zero) and negative (i.e., signed annual AQ < zero). The innate potion of the annual accrual error is the predicted value from the regression below and the discretionary portion of the error is the residual from the regression below: $\textit{Annual AQ Error}_t = \beta_0 + \beta_1 \textit{ Firm Size}_t + \beta_2 \textit{ Losses}_{t-4tot} + \beta_3 \textit{ Sales Volatility}_{t-4tot} + \beta_4 \textit{ Cash FlowVolatility}_{t-4tot} + \beta_5 \textit{ Operating Cycle}_{t-4tot} + \varepsilon$. We decile rank *MgrlAbility* and accrual error by industry-year. Intercept is included, but not tabulated. See Table 1, Panel C of the manuscript for variable definitions.
*, **, *** denotes a two-tailed p-value of less than 0.10, 0.05, and 0.01, respectively.

Table 10
Earnings Quality and Alternative Proxies for Managerial Ability

$$TotalEarnQuality_{t+1,t+4} = \alpha_0 + \boldsymbol{\alpha_1 MgrlAbility_t} + \alpha_2 Firm\ Size_t + \alpha_3 SalesVolatility_{t-4,t} + \alpha_4 CashFlowVolatility_{t-4,t} + \alpha_5 OperCycle_{t-4,t} + \alpha_6 Losses_{t-4,t} + \alpha_7 NationalAuditor_t + \alpha_8 \Delta SalesGrowth_t + \alpha_9 AbnormalReturn_t + \varepsilon_{t+1}$$

		Dependent Variable =			
	Pred.	*Total EarnQuality*			
MgrlAbility	+	*0.43***			*0.32***
		6.32			*2.31*
Historical Ret	+		0.94***		0.89***
			13.15		*7.30*
Media Citations	+			–0.29**	*–0.17*
				–2.09	*–1.14*
Firm Size	+	0.28***	*0.27****	0.24***	0.25***
		22.75	*18.83*	*8.35*	*7.96*
NationalAuditor	+	0.16***	0.00	0.41	0.21
		2.76	*0.11*	*1.56*	*0.77*
ΔSalesGrowth	–	0.00	0.00	0.02	0.00
		0.24	*0.70*	*0.46*	*0.04*
AbnormalReturn	–	0.08***	0.03	0.14***	0.09**
		5.31	*1.47*	*4.14*	*2.23*
Total Observations		15,238	11,229	4,579	4,061
Pseudo R^2		2.05%	2.36%	0.72%	1.27%

Notes This table reports the results from the ordered logistic regression of total earnings quality (*Total EarnQuality)* on managerial ability and controls. *Total EarnQuality* is the sum of three earnings quality variables: (1) the rank of the estimation portion of accruals quality ($I\widehat{NNATE}$), (2) the rank of firm-specific earnings persistence, and (3) –1 × RESTATE. Thus, the variable ranges from a low of negative one to a high of two. We exclude the controls for innate firm characteristics that make it difficult to estimate accruals from this table because we use the control variables in the partitioning of total accruals. We decile rank *MgrlAbility, Historical Returns,* and *Media Citations* by industry-year. The sample size is reduced for specifications including Media Citations as this variable is limited to Execucomp firms from 1995–2005. Intercept is included, but not tabulated. See Table 1, Panel C for variable definitions. Standard errors reflect robust standard errors that are clustered by firm. We find similar results when we cluster by year.

*, **, *** denotes a two-tailed p-value of less than 0.10, 0.05, and 0.01, respectively.

Table 11
Change in Accruals Quality and Change in Managerial Ability

$\Delta AQ = \beta_0 + \boldsymbol{\beta_1}\, \Delta\boldsymbol{MgrlAbility} + \beta_2\, \Delta Firm\ Size + \beta_3\, \Delta Losses + \beta_4\, \Delta Sales\ Volatilty + \beta_5 \Delta Cash\ Flow\ Volatility + \beta_6\, \Delta Operating\ Cycle + \beta_7 \Delta SalesGrowth_t + \beta_8 \Delta AbnormalReturn_t + \varepsilon$

		Dependent Variable =
	Prediction	*Annual* ΔAQ
$\Delta MgrlAbility$	+	0.04*
		1.69
$\Delta Firm\ Size$	+	*0.00*
		0.84
$\Delta SalesVolatility$	–	0.00
		0.19
$\Delta CashFlowVolatility$	–	–0.03
		–0.30
$\Delta OperCycle$	–	0.02
		0.44
$\Delta Losses$	–	0.02
		1.05
$\Delta SalesGrowth$	–	0.03***
		2.06
$\Delta AbnormalReturn$	–	–0.01**
		–2.59
Total Observations		123
R^2		13.02%

Notes: This table presents the OLS regression of changes in accruals quality on changes in managerial ability and changes in control variables, where the change in earnings quality, as well as the change in each of the control variables, is measured from year AQ_{c+1}–AQ_{c-1}, where c is the year in which the CFO changed. Thus, a positive value of ΔAQ signifies an improvement in earnings quality following the new CFO appointment. The change in managerial ability reflects the difference between the newly appointed CFO's score from his or her prior firm and the departing CFO's score from the current firm (i.e., $MgrlAbility_{j,b,c-1}$ – $MgrlAbility_{i,a,c-1,}$ where manager b was hired by firm *i* and was previously employed by firm *j*). A positive value of ΔMgrlAbility signifies that the incoming manager is deemed more efficient than the outgoing manager. We do not include Δ*National Auditor* as a control variable due to lack of variation. Intercept is included, but not tabulated. See Table 1, Panel C for variable definitions.

*, **, *** denotes a two-tailed p-value of less than 0.10, 0.05, and 0.01, respectively.