Managerial Ability and Income Smoothing*

Bok Baik
Seoul National University
bbaik@snu.ac.kr

Sunhwa Choi
Lancaster University and *Sungkyunkwan University*
s.choi@lancaster.ac.uk

David B. Farber
Indiana University Kelley School of Business Indianapolis
dbfarber@iupui.edu

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I. INTRODUCTION

A primary purpose of financial reporting is to provide information that is useful for decision making (FASB 2010). SFAC No. 8 (FASB 2010) suggests that because accruals smooth fluctuations in the timing of cash payments and receipts, income smoothing[1] can potentially enhance users' ability to assess a firm's future performance. Anecdotal evidence suggests that managers believe that smoothing makes their firms' earnings more useful. In their survey paper, Graham, Campbell, and Rajgopal (2005) document that financial executives believe that smooth earnings help analysts and investors to predict future earnings.[2] While cross-country studies suggest that smoothing reflects opportunistic behavior of insiders (e.g., Leuz, Nanda, and Wysocki 2003; Bhattacharya, Daouk, and Welker 2003), U.S.-based studies show that smoothing enhances earnings informativeness and the ability of stock prices to anticipate future performance (e.g., Subramanyam 1996; Tucker and Zarowin 2006). We extend prior studies on smoothing by identifying an important determinant of smoothing - managerial ability. Specifically, our study examines whether high ability managers are more likely than low ability managers to smooth income. We also test whether smoothing by higher ability managers improves the informativeness of current earnings and stock prices about future firm performance more than smoothing by low ability managers.

We employ a powerful setting for informing the debate surrounding the usefulness of smoothing because it likely varies cross-sectionally with managerial ability (Demski 1998; Schipper and Vincent 2003; Kirschenheiter and Melumad 2004). To effectively smooth earnings,

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[1] We define income smoothing as the intentional dampening of earnings fluctuations, consistent with Beidleman (1973). For the remainder of the paper, we interchangeably use "income smoothing" and "smoothing".

[2] Nearly all (96.9%) of the financial executives indicated a preference for smoother earnings, while 80% of financial executives indicated that smoother earnings help analysts and investors predict future earnings.

managers must accurately forecast earnings. Accurate earnings forecasts, in turn, require a keen understanding of firms' economic prospects. Supporting this argument, prior research shows that managerial ability is positively related to the accuracy of management earnings forecasts (Baik, Farber, and Lee 2011) and accruals (Demerjian, Lev, Lewis, and McVay 2013), and that high ability managers have superior business knowledge compared to low ability managers (Coff 1999; Holcomb, Holmes, and Connelly 2009). Thus, high ability managers can use smoothing as a channel to reduce information asymmetry. While low ability managers might also smooth earnings, given the skills required to smooth and the potential costs associated with poor smoothing decisions, we expect that low ability managers are less likely to smooth. We therefore expect that compared to low ability managers, high ability managers are more likely to use their discretion to reveal their private information through smoothing.[3, 4]

An important research question that we address is whether smoothing by high ability managers enhances the informativeness of current earnings about future performance. Given that high ability managers possess superior skill to anticipate changes in their firms' underlying economics, to estimate accruals (Demerjian et al. 2013), and to forecast earnings (Baik et al. 2011), we expect that smoothing by high ability managers incorporates more forward-looking information (i.e., future cash flows) into current earnings, thereby improving earnings informativeness. In contrast to high ability managers, low ability managers are less skillful in predicting changes in their firms' economics, and to the extent that they smooth earnings, these earnings likely contain

[3] Smoothing is a credible signal because managers would be irrational to report earnings that are higher than what they expect to persist because their firms would likely incur negative capital market consequences and managerial reputation would likely decline. This argument is consistent with that in Ronen and Sadan (1981), who adopt Spence's (1973) model to predict firms' smoothing.

[4] However, high ability managers have more to lose in terms of compensation (Falato, Li, and Milbourn 2012; Graham, Li, and Qiu 2012) and reputation (Fudenberg and Tirole 1995) if unexpected negative shocks in the future lead to a poor mapping of current earnings to future earnings realizations. Thus, higher ability managers would likely have less of an incentive to smooth if the costs of doing so outweigh the benefits.

noise, thereby reducing earnings informativeness. We also examine whether smoothing by high ability managers enhances stock price informativeness more so than smoothing by low ability managers.

We execute our tests using a common factor for firm-level smoothing based on three measures of smoothing used in cross-country and U.S.-based studies (e.g., Leuz et al. 2003; Tucker and Zarowin 2006; Dou, Hope, and Thomas 2013): (i) standard deviation of earnings divided by standard deviation of cash flows from operations; (ii) correlation between changes in accruals and changes in cash flows from operations; and (iii) correlation between changes in discretionary accruals and changes in pre-managed earnings. We use the model from Lang, Lins, and Maffett (2012) to partition our smoothing measure into its fundamental and discretionary components. Our main proxy for managerial ability is MA-Score (Demerjian, Lev, and McVay 2012), which is a measure of the ability of a firm's management team derived from Data Envelope Analysis (DEA).

We conduct our analyses using a large sample of U.S. firms over the period 1991-2011. As a first step in our examination, we assess whether managerial ability is positively related to smoothing and report that this is indeed the case. We next examine whether smoothing by high ability managers incorporates more forward-looking information into current earnings than smoothing by low ability managers. Consistent with our hypothesis, we find that smoothing by high ability managers enhances the ability of current earnings to predict future cash flows. In contrast, smoothing by low ability managers reduces the ability of current earnings to predict future cash flows. This finding is economically significant in that, at the highest level of smoothing, the magnitude of the relation between current earnings and future cash flows for high ability managers is about two times greater than that for low ability managers. This contrasting impact of smoothing by high versus low ability managers on earnings informativeness highlights the importance of considering managerial ability in assessing the usefulness of smoothing. We also find that discretionary smoothing by high ability managers enhances the informativeness of earnings, consistent with the idea that high ability managers use discretion in accounting choices to smooth earnings. These findings suggest that smoothing by high ability managers improves earnings informativeness by reflecting more forward-looking information into current earnings.

We next examine the impact of smoothing by high ability managers on stock price informativeness. To do so, we modify a future earnings response coefficient (FERC) model (Collins, Kothari, Shanken, and Sloan 1994; Lundholm and Myers 2002; Tucker and Zarowin 2006) by decomposing earnings into accruals and cash flows.[5] We show that smoothing by high ability managers enhances stock price informativeness about future cash flows. Similar to the results from the earnings informativeness test, we find that smoothing by low ability managers reduces stock price informativeness. We also find a positive and significant relation between discretionary smoothing by high ability managers and stock price informativeness. To help link the earnings informativeness test and stock price informativeness test, we re-run the stock price informativeness test using a 30-day earnings announcement period and a 30-day non-earnings announcement period. We find evidence that the effect of managerial ability on stock price informativeness is concentrated around the earnings announcement period, implying that current earnings is a channel through which smoothing by high ability managers conveys information to equity investors. Overall, results from the stock price informativeness tests are consistent with the characterization of smoothing as a credible signal to equity investors about firms' future

[5] This model allows us to draw inferences about whether the market actually receives the signal and impounds information about future performance that is embedded in smoothed earnings (Orpurt and Zang 2009).

performance, supporting the argument that smoothing by high ability managers is useful to equity investors.

It is possible that firms could select managers based on firms' particular needs (Francis, Hung, Rajgopal, and Zang 2008), leading to a potential self-selection problem in our study. To assess whether this form of endogeneity impacts our results, we exclude firm-year observations with CEO or CFO turnover to ensure that the management team is stable over the analysis period and re-estimate our models. Results using a constant management sample are similar to the main results. We also assess endogeneity by utilizing within-firm variation in managerial ability and again find that our inferences are qualitatively similar to our main results. Notwithstanding our tests for potential self-selection, we cannot completely rule out endogeneity.

We also investigate whether cross-sectional differences in firms' information asymmetry influence high ability managers' use of smoothing to signal their private information.[6] We find that the relation between smoothing and managerial ability is more pronounced for firms with higher information asymmetry. Moreover, the effects of smoothing by high ability managers on improving the informativeness of earnings and stock prices are stronger for firms with higher levels of information asymmetry.

Although we focus on smoothing as the channel through which managers communicate their private information to investors, managers plausibly have several other signaling channels, such as management forecasts, dividends, and stock repurchases. We therefore assess the sensitivity of our results based on whether firms employ these other signaling channels. We find that smoothing by high ability managers is more pronounced for firms with fewer other signaling channels. These results suggest that the impact of smoothing by high ability managers on earnings

[6] Signaling was originally developed as a mechanism to mitigate information asymmetry (Spence 1973).

and stock price informativeness is more salient for firms with fewer other signaling channels. These results are consistent with the notion that financial reporting is used to signal private information when communication with investors is limited (Dye 1988; Schipper 1989). As an alternative test of our earnings informativeness hypothesis, we estimate a modified Dechow and Dichev (2002) model and find that smoothing by high ability managers improves earnings informativeness.

Our study makes several important contributions to the literature. First, we add to the literature examining the usefulness of smoothing and, more broadly, to the literature on the use of financial reporting to communicate managers' private information (Subramanyam 1996; Demski 1998; Sankar and Subramanyam 2001; Louis and Robinson 2005; Tucker and Zarowin 2006; Louis and White 2007). In U.S.-based studies on the informativeness of smoothing, Subramanyam (1996) and Tucker and Zarowin (2006) report that smoothing improves the informativeness of earnings and stock prices. We extend Subramanyam (1996) and Tucker and Zarowin (2006) by identifying an important new source of variation in smoothing - managerial ability - and linking it to the informativeness of earnings and stock prices about future performance. Our study also answers Dechow, Ge, and Schrand's (2010) call for more research that uses a complete path approach, which provides deeper insights than research that only examines either determinants or consequences of smoothing.

Our study is also related to the emerging stream of research on the role of managerial ability in the determination and consequences of earnings quality (Demerjian et al. 2013; Demerjian, Lewis, and McVay 2017). In a contemporaneous study, Demerjian et al. (2017) also find a positive association between managerial ability and smoothing. Our study primarily differs from Demerjian et al. (2017) in that we assess the impact of smoothing by high ability managers on the informativeness of earnings and stock prices, while Demerjian et al. (2017) focus on the future operating performance consequences associated with smoothing by high ability managers and their incentives to smooth.[7] We also extend research on determinants of smoothing (Dascher and Malcom 1970; Barnea, Ronen, and Sadan 1976; McNichols and Wilson 1988; Chaney, Jeter, and Lewis 1998; Kanagaretnam, Lobo, and Yang 2004) by identifying managerial ability as an important determinant of smoothing. Findings from our study should be of interest to researchers, practitioners, and others concerned with understanding the determinants and usefulness of income smoothing.

Our study proceeds as follows. In section II, we review the relevant literature and develop our hypotheses. In section III, we provide our data and methodology. Section IV contains our empirical results and section V reports additional tests. We summarize and conclude our study in section VI.

II. LITERATURE REVIEW AND HYPOTHESES

Our study is related to research that investigates determinants and consequences of smoothing, and to research that assesses the role of managerial ability in financial reporting. Below, we briefly review this literature and develop our hypotheses.

Managerial Ability and Smoothing

Following Beidleman (1973), we define income smoothing as the use of managerial discretion to dampen fluctuations in earnings streams. There is a fairly well developed empirical literature on determinants of smoothing (e.g., Dascher and Malcom 1970; Barnea et al. 1976;

[7] We discuss Demerjian et al. (2017) in more detail in the literature review section.

McNichols and Wilson 1988; Chaney et al. 1998; Kanagaretnam et al. 2004). We extend this literature by examining whether a *managerial* characteristic, namely ability, affects smoothing.

Prior research suggests a plausible link between managerial ability and smoothing. Ronen and Sadan (1981) adapt Spence's (1973) signaling model to argue that smoothing is a credible signal because managers would be irrational to report earnings that they do not expect to persist due to the significant costs that firms and managers would incur in terms of negative capital market consequences and a diminution of managerial reputation. Moreover, the ability to develop good expectations about earnings persistence necessarily requires superior ability to forecast changes in firms' economic prospects. That is, to effectively smooth earnings, managers must accurately forecast earnings, which necessarily requires an acute understanding of firms' economic prospects. Supporting this argument, prior research shows that higher ability managers have superior business knowledge compared to lower ability managers (Coff 1999; Holcomb et al. 2009) and that managerial ability is positively related to the accuracy of management earnings forecasts (Baik et al. 2011) and the accuracy of accruals (Demerjian et al. 2013).

More directly related to the relation between managerial ability and smoothing, Chaney and Lewis (1995) provide a model based on Spence (1973) to argue that "high-quality" firms use smoothing to signal their type. Demski (1998) shows that smoothing is desirable in efficient contracting when hard-working (i.e., more capable) managers are able to observe future output in a timely manner. Sankar and Subramanyam (2001) develop a two-period model in which managers smooth income to communicate their private information through reported earnings. Smoothing can thus alleviate information asymmetry between managers and investors. Schipper and Vincent (2003) suggest that managers with superior information about future earnings innovations are well positioned to smooth earnings. Kirschenheiter and Melumad (2004) theorize that, in equilibrium, better informed managers report smoother earnings. In a contemporaneous study, Demerjian et al. (2017) also assess the relation between smoothing and managerial ability. Using 13,153 firm-year observations over the 1995-2013 period, Demerjian et al. (2017) find that high ability managers are more likely to engage in intentional smoothing. They also report that high ability managers' intentional smoothing is associated with superior future earnings and that the degree of smoothing is related to high ability managers' incentives to benefit shareholders (e.g., avoiding debt covenant violations) but not related to the incentives for their personal gains (e.g., inside trading). While we also find a positive association between managerial ability and smoothing, our study differs from Demerjian et al. (2017) in several important ways. First, our study focuses on the usefulness of smoothing in terms of earnings informativeness and stock price informativeness, while Demerjian et al. (2017) focus on the operating consequences of smoothing and managers' incentives to smooth. We address the question of the usefulness of smoothing because helping investors' decision-making is a key issue in theoretical and empirical papers on smoothing (Subramanyam 1996; Demski 1998; Sankar and Subramanyam 2001; Tucker and Zarowin 2006). Second, we view smoothing as a signaling channel to address information asymmetry, while Demerjian et al. (2017) view smoothing as a form of earnings management. Their view is reflected in their measurement of smoothing as a principal component of the absolute value of discretionary accruals and real earnings management, while our study adopts multiple measures of smoothing from the prior smoothing literature. Overall, the two studies complement each other in providing evidence on the association between managerial ability and smoothing.

While the preceding discussion suggests a positive relation between managerial ability and smoothing, this does not negate the possibility that low ability managers would also smooth earnings to mimic the strategy of high ability managers (i.e., pooling equilibrium where high and low ability managers choose the same level of smoothing) or to obfuscate their poor performance. However, given the skills required to smooth and the potential costs associated with poor smoothing decisions, low ability managers would likely be more constrained from smoothing than high ability managers and thus should be less likely to engage in as much smoothing as high ability managers. The preceding analysis leads to our first hypothesis, stated in the alternative form:

H1: There is a positive relation between smoothing and managerial ability.

We may not find evidence consistent with our hypothesis if the costs of smoothing outweigh the benefits of doing so. High ability managers might suffer a loss of compensation (Graham et al. 2012; Falato et al. 2012) and reputation (Fudenberg and Tirole 1995) if unexpected negative shocks in the future lead to a poor mapping of current earnings (based on smoothing) to future earnings realizations. Additionally, Ronen and Sadan (1981) argue that smoothing is costly due to actions by auditors, legal liability, or regulatory intervention (e.g., SEC enforcement). Moreover, potential costs associated with the revelation of proprietary information also likely reduce incentives to smooth. Managers plausibly incorporate the likelihood of these costs when making smoothing decisions.

The Impact of Smoothing on the Informativeness of Earnings and Stock Prices about Future Performance

A natural question arising from our discussion about the relation between managerial ability and smoothing is whether smoothing associated with managerial ability is useful for decision making. Prior cross-country studies generally provide results suggesting that smoothing reduces earnings informativeness. Leuz et al. (2003) show that smoothing is higher in countries with weaker investor protection. Bhattacharya et al. (2003) find that smoothing is related to a higher cost of capital and lower trading volume. Biddle and Hilary (2006) report that smoothing is related to lower investment efficiency, while DeFond, Hung, and Trezevant (2007) show that more smoothing leads to higher variance in returns around annual earnings announcements. In sum, cross-country studies suggest that managers in countries with weak investor protection use smoothing to conceal private benefits of control, suggesting negative economic consequences associated with smoothing.

U.S.-based studies, on the other hand, highlight that smoothing on average improves earnings informativeness and stock price informativeness about future performance. Subramanyam (1996) reports a positive relation between discretionary accruals and stock returns, and that smoothing improves the persistence and predictability of earnings. Tucker and Zarowin (2006) report that smoothing improves stock price informativeness about future performance. We extend prior research by identifying a new potential source of cross-sectional variation in smoothing, managerial ability, and by assessing whether it improves the informativeness of current earnings and stock prices about future performance. As Dechow et al. (2010, p. 390) indicate, studies that take a complete path approach "…substantially enhance our understanding of earnings quality". Our assessment of the relation between managerial ability and smoothing, as well as the impact of managerial ability on the informativeness of earnings and stock prices about future firm performance, provides such a complete path.

To the extent that high ability managers have superior skills in assessing their firms' future performance, we expect that discretionary accounting choices (e.g., accruals) by high ability managers likely incorporate more forward-looking information into current earnings through smoothing to reveal their private information about future cash flows in U.S. firms (Sankar and Subramanyam 2001). In contrast, we expect that smoothing by low ability managers may introduce noise in reported earnings because their skill at forecasting changes in their firms' economics is low. As a result, smoothing by low ability managers can reduce earnings informativeness. Thus, compared to smooth earnings reported by low ability managers, smooth earnings reported by high ability managers likely contain more information about future performance. The foregoing arguments lead to the second hypothesis, stated in the alternative form, as follows:

H2: Compared to smoothing by low ability managers, smoothing by high ability managers enhances the informativeness of current earnings about future performance.

Tucker and Zarowin (2006) provide evidence suggesting that stock prices incorporate more information about future performance when firms smooth their earnings. The rationale underlying this result is that since managers with more information about their firm's future can smooth successfully, *current* earnings reveal information about a firm's future performance. Smoothed current earnings can therefore act as a mechanism that allows investors to predict a firm's future economic performance. We extend Tucker and Zarowin (2006) by assessing whether smoothing by high ability managers improves stock price informativeness in U.S. firms. As discussed above, high ability managers are likely to use smoothing to reveal their private information about future firm performance. Given high ability managers' superior skill at assessing changes in their firms' economics, smoothing by high ability managers likely provides investors with an accurate picture of future firm performance. If so, then smoothing by high ability managers would allow current stock returns to better anticipate future cash flows, thereby enhancing stock price informativeness. To the extent that low ability managers smooth earnings and that their smoothing decisions introduce noise, as discussed earlier, we expect that smoothing by low ability managers would reduce stock price informativeness. This discussion leads to our third hypothesis stated in the alternative form, as follows:

H3: Compared to smoothing by low ability managers, smoothing by high ability managers enhances the informativeness of current stock prices about future performance.

III. DATA AND METHODOLOGY

Data

Our initial sample includes firm-years from the intersection of the Compustat and CRSP databases for the years 1991-2011 after excluding financial services and utilities firms.[8] We exclude firm-years with M&A activity in excess of five percent of lagged assets, as major acquisition activity could unduly affect both managerial ability and income smoothing (McNichols 2002; Demerjian et al. 2013).[9] After requiring data to compute the regression variables, our final sample consists of 43,322 firm-year observations. To mitigate the effect of outliers, we winsorize variables at the 1% and 99% levels.

Managerial Ability Measure

To measure managerial ability for each firm, we use a DEA-based method developed by Demerjian et al. (2012). DEA is a nonparametric method that measures the relative efficiency of decision making units (DMUs). DEA uses linear programming to create an efficient frontier of observed production points to maximize a ratio of outputs to inputs. DEA assigns a value of one to the most efficient DMUs on the frontier and values of less than one to inefficient DMUs, with the efficiency score for inefficient units being interpreted as the distance from the frontier (see Appendix I for more details). The DEA score represents how efficiently a firm's management team utilizes available corporate resources to maximize outputs (Baik, Chae, Choi, and Farber 2013).

The DEA-based measure of managerial ability has several advantages over other measures of managerial ability frequently used in the literature. First, it is a manager-specific measure, while other measures are usually firm-specific (e.g., past abnormal performance). Demerjian et al. (2012)

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[8] Our sample begins in 1991 because we require at least three observations for changes in cash flows for *SMTH2* and the Statement of Cash Flows became widely available in 1988. We use data through 2015 but the final sample period stops in 2011 to ensure a sufficient period to calculate our future smoothing measure ($SMTH_{t, t+4}$).

[9] We re-estimate our models without this filter, leaving inferences unchanged.

support the DEA-based measure by showing that it is more attributable to manager effects than to firm effects. Demerjian et al. (2012) further find that the manager-specific component of the DEA-based measure is greater than that of alternative measures such as compensation and industry-adjusted ROA. Second, it is measured directly from actual firm performance reflected in financial statements, rather than relying on the perceived managerial ability by outsiders (e.g., media citations, CEO awards). For example, media citations are often criticized as not being significantly associated with firm performance as well as being biased due to the media's own incentives (LaFond 2008). Finally, the DEA-based ability measure is directly linked to a firm's goal of maximizing profits.[10]

We follow the two-step procedure from Demerjian et al. (2012) to obtain a manager-level DEA score. In the first step, we obtain a measure of efficiency by solving an optimization problem (using DEA) that maximizes an output variable based on seven input variables. We use sales revenue as our sole output variable and use the following seven input variables: (i) net property, plant, and equipment (PP&E), (ii) cost of goods sold (COGS), (iii) selling, general, and administrative costs (SG&A), (iv) capitalized operating leases, (v) net research and development (R&D) costs, (vi) purchased goodwill, and (vii) other intangible assets. The efficiency score from the optimization procedure includes both manager and firm characteristics. To arrive at our measure of managerial ability, we estimate the following Tobit model (by industry) to purge firm-level characteristics:

[10] It is important to note that the ability measure we employ reflects only one aspect of managerial ability, the ability to generate higher revenues from a given set of inputs. Our measure does not capture other potential aspects of managerial ability, such as innovation and the development of new products and business models for long-term sustainable growth.

$$\textit{Firm Efficiency}_t = \alpha_0 + \alpha_1\,\textit{Firm size}_t + \alpha_2\,\textit{Market share}_t + \alpha_3\,\textit{Positive free cash flow}_t + \alpha_4\,\textit{Age}_t + \alpha_5\,\textit{Business segment concentration}_t + \alpha_6\,\textit{Foreign currency indicator}_t + \textstyle\sum_t \textit{Year}_t + \varepsilon_t \qquad \textbf{(1)}$$

The dependent variable in Equation (1) is firm efficiency derived from DEA, measured between zero and one. Control variables are designed to capture firm-level characteristics that can affect firm efficiency. We provide definitions of the variables in Appendix II. The residual from Equation (1) is our main measure of managerial ability, which Demerjian et al. (2012) attribute to the management team.[11] Following Demerjian et al. (2013), we decile rank the residual by year and industry to create our measure of managerial ability, *MA-Score.*

Income Smoothing Measures

We combine three commonly used measures of income smoothing to mitigate measurement error (Leuz et al. 2003; Tucker and Zarowin 2006; Dou et al. 2013). Our aggregate income smoothing measure (*SMTH*) is the common factor identified from a factor analysis of *SMTH1*, *SMTH2*, and *SMTH3*. *SMTH1* is the standard deviation of operating earnings divided by the standard deviation of cash flows from operations, where earnings and cash flows are scaled by lagged total assets (Leuz et al. 2003; Dou et al. 2013). The intuition for *SMTH1* is that earnings will be smoother (i.e., earnings are less volatile) than cash flows from operations (i.e., underlying volatility of a firm's operations) if managers smooth reported earnings. *SMTH2* is the Spearman correlation between the change in total accruals and the change in cash flows from operations (both scaled by lagged total assets). This measure captures the extent to which managers use accruals to smooth reported earnings in response to shocks to a firm's economic performance (i.e., operating

[11] We assess the robustness of our main findings using a number of alternative measures of managerial ability: (i) historical industry-adjusted stock returns, (ii) historical industry-adjusted ROA (e.g., Rajgopal, Shevlin, and Zamora 2006; Demerjian et al. 2012), and (iii) CEO awards given by various business journals such as *Business Week* and *Forbes* over the prior five years (Malmendier and Tate 2009). Untabulated results using these alternative measures of managerial ability are largely consistent with our main findings.

cash flows). *SMTH3* is the Spearman correlation between the change in discretionary accruals and the change in pre-managed income (Tucker and Zarowin 2006). We estimate discretionary accruals from the cross-sectional version of the Jones (1991) model. We calculate pre-managed income as net income minus discretionary accruals. This measure assumes that managers use discretionary accruals to smooth reported earnings. In estimating the three individual income smoothing measures, the standard deviations or the Spearman correlations are calculated over at least three of the five years and are multiplied by negative one so that larger values represent more income smoothing.

While our smoothing measures are consistent with prior studies such as Leuz et al. (2003) and Tucker and Zarowin (2006), we note that degrees of income smoothing are determined not only by managerial discretion but also by the firm's fundamental characteristics (e.g., operating environment and business strategy).[12] For example, a firm in the mature stage of its life cycle would likely have a smoother income stream than a firm in the early stage of its life cycle. One potential way to address this issue is to control for a firm's innate characteristics in the regression models, as in Tucker and Zarowin (2006). However, Dechow et al. (2010) indicate that our understanding of the usefulness of smoothing is unclear because we lack measures that distinguish fundamental and discretionary smoothing and call for better measures. We therefore follow Lang et al. (2012) and decompose smoothing into its fundamental and discretionary components. Specifically, we regress our smoothing factor on a set of fundamental determinants of smoothing, such as sales growth and the length of a firm's operating cycle (see Appendix II for more details). The predicted value from this regression is our measure of fundamental smoothing

[12] We note that our smoothing measures adopted from prior studies (e.g., *SMTH1*, *SMTH2*) capture the smoothness of accruals *relative* to underlying operating performance reflected in cash flows (Leuz et al. 2003; Dou et al. 2013). However, firm characteristics such as size and business volatility can also impact smoothing. We therefore explicitly include controls for these characteristics to obtain measures of fundamental and discretionary smoothing.

(*FUND_SMTH*), while the residual is our measure of discretionary smoothing (*DIS_SMTH*). We then examine the effect of fundamental and discretionary smoothing on the informativeness of current earnings and stock prices about future performance, conditional on managerial ability.

Empirical Models

To test our first hypothesis on the relation between managerial ability and smoothing (H1), we estimate the following regression, which is based on a model in Lang et al. (2012):

$$\begin{aligned} SMTH_{t,t+4} = {} & \beta_0 + \beta_1\, MA\text{-}Score_t + \beta_2\, Firm\ size_t + \beta_3\, Leverage_t + \beta_4\, BM\ ratio_t \\ & + \beta_5\, Sales\ volatility_t + \beta_6\, Loss\%_t + \beta_7\, Operating\ cycle_t + \beta_8\, Sales\ growth_t \\ & + \beta_9\, Operating\ leverage_t + \beta_{10}\, Avg\ CFO_t + \text{Firm and Year Fixed Effects} + \varepsilon_t \qquad \textbf{(2)} \end{aligned}$$

$SMTH_{t,t+4}$ is the aggregated measure of income smoothing over t through t+4. $MA\text{-}Score_t$ is the decile rank by industry and year of managerial ability based on the residual from Equation (1). Consistent with the literature on managerial ability and earnings quality (Francis et al. 2008; Demerjian et al. 2013), we examine the relation between managerial ability at time t and income smoothing in the future (t, t+4) to address concerns about the direction of causality. The coefficient on *MA-Score* (β_1) captures the effect of managerial ability on income smoothing after controlling for fundamental firm characteristics associated with income smoothing. Based on our arguments for H1, we predict the sign on β_1 to be positive. [13]

We also include several variables to control for fundamental features of the firm's operating environment and determinants of income smoothing (Lang et al. 2012). We control for firm size, leverage, book-to-market ratio, sales volatility, the frequency of reporting losses, operating cycle, sales growth, operating leverage, and average cash flows. We present detailed

[13] Given that the set of control variables is the same as that used to partition income smoothing into its fundamental and discretionary components, the estimated coefficient β_1 from Equation (2) is equivalent to the coefficient on managerial ability when discretionary smoothing is used as the dependent variable.

definitions of the control variables in Appendix II. Finally, we also include firm and year fixed effects to control for time-invariant firm characteristics and variation across years.

To test our hypothesis about whether smoothing by high ability managers improves earnings informativeness about future performance more than smoothing by low ability managers (H2), we estimate the following OLS regression:

$$\begin{aligned} CFO_{t+1} = {} & \gamma_0 + \gamma_1 E_t + \gamma_2 CFO_{t-1} + \gamma_3 SMTH_{t-4,\,t} + \gamma_4 SMTH_{t-4,\,t} \times E_t + \gamma_5 SMTH_{t-4,\,t} \times CFO_{t-1} \\ & + \gamma_6 HighAb_t + \gamma_7 E_t \times HighAb_t + \gamma_8 CFO_{t-1} \times HighAb_t + \gamma_9 SMTH_{t-4,\,t} \times HighAb_t \\ & + \gamma_{10} SMTH_{t-4,\,t} \times E_t \times HighAb_t + \gamma_{11} SMTH_{t-4,\,t} \times CFO_{t-1} \times HighAb_t \\ & + \text{Firm and Year Fixed Effects} + \varepsilon_t \qquad \mathbf{(3)} \end{aligned}$$

The dependent variable, CFO_{t+1}, is one-year-ahead cash flows from operations, deflated by lagged total assets. We use future cash flows, rather than future earnings, as the dependent variable to ensure that our results are not driven by the possibility that smoothed future earnings are simply more predictable. If future earnings are more predictable, then the effect of smoothing on earnings informativeness could be related to properties of future earnings rather than to the informativeness of *current* earnings. We address this concern by focusing on future cash flows, which are independent of discretionary smoothing by managers.[14] E_t is earnings before extraordinary items for year t, deflated by lagged total assets. We follow Ball and Shivakumar (2006) and include prior-period cash flows (CFO_{t-1}) to control for expected cash flows at the beginning of year t.[15] $SMTH_{t-4,\,t}$ is the aggregated measure of income smoothing measured from years t-4 to t. For ease of interpretation, we use the percentile rank of $SMTH_{t-4,\,t}$, which takes a value between zero and one.[16] $HighAb_t$ equals one if $MA\text{-}Score_t$ is above its median value, and zero otherwise.

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[14] We are grateful to the editor for insightful comments on this issue.
[15] Our inferences do not change when we exclude CFO_{t-1} from the model or when we replace CFO_{t-1} with E_{t-1} (untabulated).
[16] Our inferences are not affected when we use the continuous value of $SMTH_{t-4,\,t}$ ($DIS\_SMTH_{t-4,\,t}$ and

If smoothing improves the extent to which current earnings anticipate future cash flows, then we predict a positive coefficient on the interaction between current earnings and smoothing ($SMTH_{t-4,t}$×E_t).[17] Because we expect high ability managers to incorporate more forward-looking information (i.e., future cash flows) into current earnings through smoothing than low ability managers, we predict a positive sign on γ_{10}, our coefficient of interest.

To examine the impact of fundamental and discretionary smoothing on the extent to which current earnings incorporate future cash flows, we re-estimate Equation (3) after replacing total smoothing with discretionary smoothing ($DIS\_SMTH_{t-4,t}$) and fundamental smoothing ($FUND\_SMTH_{t-4,t}$). We decompose total smoothing into its fundamental and discretionary smoothing components based on the model described in Lang et al. (2012).[18]

To test our hypothesis (H3) about whether smoothing by high ability managers enhances stock price informativeness about future performance more than smoothing by low ability managers, we modify a future earnings response coefficient (FERC) model (e.g., Collins et al. 1994; Lundholm and Myers 2002; Choi, Myers, Zang, and Ziebart 2011) by decomposing earnings into accruals and cash flows. We further include interactions with income smoothing and managerial ability (Tucker and Zarowin 2006). We estimate the following OLS regression:

$FUND\_SMTH_{t-4,\,t}$) in Equations (3) and (4) (untabulated).

[17] We predict a positive coefficient on $SMTH_{t-4,t}$×E_t when managerial ability and its interactions are not included in the regression (i.e., average effect of smoothing on earnings informativeness). Note that when managerial ability and its interactions are in the model, the coefficient on $SMTH_{t-4,t}$×E_t reflects the effect of smoothing by low ability managers on earnings informativeness and its sign is expected to be negative if smoothing by low ability managers adds noise to reported earnings.

[18] More specifically, the predicted (residual) value from the following regression is $FUND\_SMTH_{t-4,t}$ ($DIS\_SMTH_{t-4,t}$).

$$SMTH_{t-4,\,t} = \eta_0 + \eta_1\, Firm\ size_t + \eta_2\, Leverage_t + \eta_3\, BM\ ratio_t + \eta_4\, Sales\ volatility_t + \eta_5\, LOSS\%_t + \eta_6\, Operating\ cycle_t + \eta_7\, Sales\ growth_t + \eta_8\, Operating\ leverage_t + \eta_9\, AvgCFO_t + \textstyle\sum_t Year_t + \sum_k Industry_k + \varepsilon_t$$

$$
\begin{aligned}
R_t = {} & \delta_0 + \delta_1 XAC_{t-1} + \delta_2 XAC_t + \delta_3 XAC_{t+1} + \delta_4 XCF_{t-1} + \delta_5 XCF_t + \delta_6 XCF_{t+1} + \delta_7 R_{t+1} \\
& + \delta_8 SMTH_{t-4,\,t} + \delta_9 SMTH_{t-4,\,t} \times XAC_{t-1} + \delta_{10} SMTH_{t-4,\,t} \times XAC_t + \delta_{11} SMTH_{t-4,\,t} \times XAC_{t+1} \\
& + \delta_{12} SMTH_{t-4,\,t} \times XCF_{t-1} + \delta_{13} SMTH_{t-4,\,t} \times XCF_t + \delta_{14} SMTH_{t-4,\,t} \times XCF_{t+1} \\
& + \delta_{15} SMTH_{t-4,\,t} \times R_{t+1} + \delta_{16} HighAb_t + \delta_{17} XAC_{t-1} \times HighAb_t + \delta_{18} XAC_t \times HighAb_t \\
& + \delta_{19} XAC_{t+1} \times HighAb_t + \delta_{20} XCF_{t-1} \times HighAb_t + \delta_{21} XCF_t \times HighAb_t \\
& + \delta_{22} XCF_{t+1} \times HighAb_t + \delta_{23} R_{t+1} \times HighAb_t + \delta_{24} SMTH_{t-4,\,t} \times HighAb_t \\
& + \delta_{25} SMTH_{t-4,\,t} \times XAC_{t-1} \times HighAb_t + \delta_{26} SMTH_{t-4,\,t} \times XAC_t \times HighAb_t \\
& + \delta_{27} SMTH_{t-4,\,t} \times XAC_{t+1} \times HighAb_t + \delta_{28} SMTH_{t-4,\,t} \times XCF_{t-1} \times HighAb_t \\
& + \delta_{29} SMTH_{t-4,t} \times XCF_t \times HighAb_t + \delta_{30} SMTH_{t-4,t} \times XCF_{t+1} \times HighAb_t \\
& + \delta_{31} SMTH_{t-4,\,t} \times R_{t+1} \times HighAb_t + \text{Control variables and their interactions} \\
& + \text{Firm and Year Fixed Effects} + \varepsilon_t \qquad \mathbf{(4)}
\end{aligned}
$$

R_t is the cumulative buy-and-hold return for the fiscal year, XAC_t and XCF_t are accruals and operating cash flows for year *t*, respectively, scaled by beginning of year market value of equity.[19] R_{t+1} (future returns) is the cumulative buy-and-hold return for year *t*+1 and is included to control for the measurement error generated by events occurring in the future that affect XCF_{t+1} but were not anticipated at the end of year *t* (Collins et al. 1994). As before, we use the percentile rank of $SMTH_{t-4,\,t}$ and an indicator variable for managerial ability ($HighAb_t$) based on its median value. We also note that some firm characteristics and aspects of firms' information environment can affect stock price informativeness. To address this issue, we include in the regressions firm size, earnings volatility, the number of analysts following the firm, institutional holdings, as well as their interactions.[20]

When we use future earnings as a measure of future performance in a regression with current stock returns as the dependent variable, the coefficient on future earnings captures the ability of current stock returns to reflect the information about future earnings, commonly called

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[19] In Equation (4), we deflate accruals and cash flows by market value of equity, rather than by total assets as in Equation (3), to be consistent with prior studies on FERCs (Tucker and Zarowin 2006) and because the dependent variable (i.e., returns) is essentially market value changes deflated by beginning market value. As an alternative specification, we use lagged total assets as a deflator in Equation (4), leaving inferences unchanged (untabulated).

[20] In untabulated results, we also include an indicator variable for management forecasts and find similar results to those reported.

the future earnings response coefficient (FERC). This measure is widely used as a proxy for stock price informativeness.[21] For example, Tucker and Zarowin (2006) show that stock returns of firms with smoother earnings contain more information about future earnings than stock returns of firms with less smooth earnings (i.e., there is a positive coefficient on the interaction between future earnings and income smoothing), implying that smoothing improves stock price informativeness about future earnings. While earnings is an important summary performance measure, predicting future cash flows is the main task in equity valuation. Furthermore, focusing on future cash flows, rather than on future earnings, enables us to address the possibility that future earnings are simply more predictable when earnings are smoothed. As a result, we focus on the coefficients on future cash flows and their interactions, consistent with our approach in Equation (3). Therefore, our variable of interest is the coefficient on the three-way interaction among future cash flows, smoothing, and managerial ability (δ_{30}), since this coefficient directly captures the channel through which smoothing by high ability managers impacts stock price informativeness about future cash flows. We predict a positive sign on δ_{30} (H3). As described previously, we also replace total smoothing with fundamental smoothing and discretionary smoothing to examine their impact on stock price informativeness.

IV. EMPIRICAL RESULTS

Descriptive Statistics and Correlations

In Panel A of Table 1, we provide descriptive statistics for the variables used in the regression tests based on the full sample. The mean (median) of *MA-Score* is 0.502 (0.556). Panel

[21] See, for example, Collins et al. (1994), Lundholm and Myers (2002), Durnev, Morck, Yeung, and Zarowin (2003), Tucker and Zarowin (2006), and Fernandes and Ferreira (2009).

B of Table 1 presents the mean values of the variables separately for firms with high and low ability managers. All of the aggregated measures of smoothing (i.e., $SMTH_{t,t+4(t\text{-}4,t)}$, $FUND\_SMTH_{t,t+4(t\text{-}4,t)}$, $DIS\_SMTH_{t,t+4(t\text{-}4,t)}$) are significantly greater for the high ability group than for the low ability group, providing univariate evidence consistent with H1, in which we predict a positive relation between smoothing and managerial ability. Firms with high ability managers are characterized by smaller size (*Firm size*), higher growth (*Sales growth*, *BM ratio*), more volatile business (*Sales volatility*), and higher firm performance (*Avg CFO*, *Loss%*, E_t, and R_t).

[Insert Table 1 here]

Table 2 provides correlations between our smoothing and ability measures. Our primary measure of managerial ability, *MA-Score*, is positively and significantly related to each of our measures of smoothing, consistent with the results in Panel B of Table 1. Similar to the results in Demerjian et al. (2012), we report that *MA-Score* is positively related to the alternative measures of ability (i.e., historical industry-adjusted stock returns and historical industry-adjusted ROA).

[Insert Table 2 here]

Regression Results for the Relation between Managerial Ability and Smoothing

We provide tests of our hypothesis about the relation between smoothing and managerial ability (H1) in Table 3. We report a positive and significant coefficient on *MA-Score* (0.082; t = 4.25), even after controlling for several fundamental firm characteristics that may affect smoothing, and firm and year fixed effects.[22]

[Insert Table 3 here]

[22] While our main results are reported using firm fixed effects, results are similar when we use standard errors clustered by firm to control for serial correlations in the residual. As alternative ways to control for serial correlations, we also use (i) the Newey-West procedure with 4 lags and (ii) the method suggested by Hjalmarsson (2011), in which OLS t-statistics are divided by the square root of the horizon to correct for the effect of a dependent variable measured with overlapping observations (i.e., $SMTH_{t,t+4}$). We find that inferences are unchanged using these approaches.

Results in Table 3 are consistent with the notion that high ability managers use their discretion to make accounting choices that dampen earnings fluctuations. We next assess the impact of smoothing by high ability managers on earnings informativeness about future performance (H2).

Regression Results for the Impact of Smoothing by High Ability Managers on Earnings Informativeness

In Table 4, we report results for tests of the hypothesis that smoothing by high ability managers improves earnings informativeness more than smoothing by low ability managers (H2). In column 1 of Panel A, we present results without smoothing, managerial ability, and their interactions. The coefficients on current earnings and lagged cash flows are both positive and significant. When we include the interactions with smoothing in column 2, we find that the coefficient on the interaction between smoothing and current earnings ($SMTH_{t-4,\,t} \times E_t$) is positive and significant (0.075; t = 3.54), indicating that smoothing improves the ability of current earnings to predict future cash flows. More importantly, when the interactions with an indicator variable for high ability managers ($HighAb_t$) are included in the model in column 3, the coefficient on $SMTH_{t-4,\,t} \times E_t \times HighAb_t$ is significantly positive (0.274; t = 6.43), suggesting that smoothing by high ability managers improves the informativeness of current earnings about future cash flows. In contrast, the coefficient on $SMTH_{t-4,t} \times E_t$, which captures the effect of smoothing on earnings informativeness for low ability managers, is negative and significant (-0.053; t = -1.90), suggesting that smoothing by low ability managers reduces earnings informativeness. Our finding of the contrasting impact of smoothing by high versus low ability managers on earnings informativeness highlights the importance of considering managerial characteristics in assessing the usefulness of smoothing.

To assess the economic significance of the results in Panel A, we calculate the estimated coefficient on current earnings (E_t) across high and low levels of managerial ability and smoothing by using the lowest and highest values of $HighAb_t$ (i.e., 0/1) and the lowest and highest values of $SMTH_{t-4,\,t}$ (i.e., 0/1) along with the estimated coefficients in column 3 of Panel A. As presented in Panel B, the calculated coefficient on E_t is 0.345 for low ability/low smoothing, 0.292 (=0.345-0.053) for low ability/high smoothing, 0.325 (=0.345-0.020) for high ability/low smoothing, and 0.546 (=0.345-0.053-0.020+0.274) for high ability/high smoothing, respectively. Therefore, high ability managers increase the relation between current earnings and future cash flows (i.e., the coefficient on E_t) by 0.221 (i.e., 68%) through smoothing, while low ability managers reduce this relation by 0.053 (i.e., 15%). At the highest value of smoothing, the magnitude of the relation between current earnings and future cash flows for high ability managers (0.546) is about 87% greater than that for low ability managers (0.292).

[Insert Table 4 here]

In Panel C of Table 4, we replace $SMTH_{t-4,\,t}$ with $FUND\_SMTH_{t-4,\,t}$ and $DIS\_SMTH_{t-4,\,t}$. Note that we use the percentile ranks of $FUND\_SMTH_{t-4,\,t}$ and $DIS\_SMTH_{t-4,\,t}$ in the regression to ensure that the coefficients are comparable. In column 1, the coefficient on $DIS\_SMTH_{t-4,\,t} \times E_t$ is positive and significant (0.090; t = 5.35). In column 2, the coefficient on $DIS\_SMTH_{t-4,t} \times E_t \times HighAb_t$ is positive and significant (0.319; t = 9.22), suggesting that discretionary smoothing by high ability managers improves the ability of current earnings to predict future cash flows. Note that the coefficient on $DIS\_SMTH_{t-4,\,t} \times E_t$ is negative and marginally significant (-0.037; t = -1.71), indicating that discretionary smoothing by low ability managers reduces earnings informativeness. We also report that the coefficient on $FUND\_SMTH_{t-4,t} \times E_t \times HighAb_t$ is positive and significant (0.233; t = 4.70).

In Panel D, we present the estimated coefficient on E_t across high and low values of managerial ability and smoothing. The coefficient on E_t is 0.400 for low ability/low discretionary smoothing, 0.363 for low ability/high discretionary smoothing, 0.302 for high ability/low discretionary smoothing, and 0.584 for high ability/high discretionary smoothing, respectively.[23] When discretionary smoothing moves from the lowest to the highest value, high ability managers improve earnings informativeness (i.e., the coefficient on E_t) by 0.282 (i.e., 93%), while low ability managers reduce it by 0.037 (i.e., 9%). Taken together, these results suggest that smoothing is an important channel through which high ability managers communicate their private information about future cash flows. Overall, the results in Table 4 support our second hypothesis that smoothing by high ability managers improves earnings informativeness more than smoothing by low ability managers.

Regression Results for the Impact of Smoothing by High Ability Managers on Stock Price Informativeness

In this section, we test our hypothesis that smoothing by high ability managers improves stock price informativeness more than smoothing by low ability managers (H3). We report results in Panel A of Table 5. We present a baseline model in column 1. The coefficients on current cash flows (XCF_t) and future cash flows (XCF_{t+1}) are significantly positive, while the coefficients on lagged cash flows (XCF_{t-1}) and future returns (R_{t+1}) are significantly negative, consistent with results in prior studies (e.g., Lundholm and Myers 2002; Tucker and Zarowin 2006).[24] In column

[23] Alternatively, we assess the coefficients across high and low values of managerial ability and smoothing when values above and below the median (instead of the lowest and highest values) of *DIS_SMTH* are used for high and low smoothing groups. The coefficient is 0.340 for low ability/low discretionary smoothing, 0.333 for low ability/high discretionary smoothing, 0.340 for high ability/low discretionary smoothing, and 0.461 for high ability/high discretionary smoothing, respectively. The difference between high ability/low discretionary smoothing and high ability/high discretionary smoothing is 0.121 (i.e., a 36% increase) and is significant at the 1% level.

[24] For brevity, we do not report the results for the control variables (i.e., firm size, earnings volatility, the number of analysts, and institutional holdings) and their interactions; untabulated results are generally consistent with prior research. Specifically, stock price informativeness is higher (lower) for large firms and firms with high institutional

2, we report a negative and significant coefficient on the interaction between our smoothing measure and future cash flows ($SMTH_{t\text{-}4,\ t} \times XCF_{t+1}$), while the coefficient on the interaction between our smoothing measure and future accruals ($SMTH_{t\text{-}4,\ t} \times XAC_{t+1}$) is positive and significant.[25]

[Insert Table 5 here]

In column 3 of Panel A, we report a positive and significant coefficient of 0.256 (t = 2.24) on the interaction term $SMTH_{t\text{-}4,t} \times XCF_{t+1} \times HighAb_t$, implying that stock prices better anticipate future cash flows when high ability managers report smoother earnings. In contrast, the coefficient on $SMTH_{t\text{-}4,t} \times XCF_{t+1}$ is negative and significant (-0.261; t = -3.07), indicating that smoothing by low ability managers reduces the ability of stock prices to anticipate future cash flows. To assess the economic significance of these results, in Panel B, we present the estimated coefficient on future cash flows (CFO_{t+1}) across high and low values of managerial ability and smoothing by using the lowest and highest values of $HighAb_t$ (i.e., 0/1) and the lowest and highest values of $SMTH_{t\text{-}4,\ t}$ (i.e., 0/1) along with the estimated coefficients in column 3 of Panel A. At the lowest value of smoothing, the difference in stock price informativeness between high and low ability managers (0.016) is not significant, while the difference (0.272) is significant at the highest value of smoothing. When total smoothing moves from the lowest to the highest value, low ability managers reduce stock price informativeness by 0.261 (i.e., 120%), while the change (-0.005) for high ability managers is not different from zero.

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holdings (firms with high earnings volatility). The coefficient on the interaction between future earnings and the number of analysts is insignificant when other control variables are included, but is positive and significant when other control variables are not included in the model.

[25] When we use one-year-ahead earnings (instead of accruals and cash flows), the sign on the coefficient of the interaction between smoothing and future earnings is positive and significant, which is consistent with Tucker and Zarowin (2006).

We next test whether results from Panel A of Table 5 hold across fundamental and discretionary smoothing. We re-estimate Equation (4) after partitioning our smoothing measure into its fundamental and discretionary components and report results in Panel C of Table 5. In column 2, we report a significantly negative coefficient of -0.319 (t = -4.09) on $DIS\_SMTH_{t-4,t} \times XCF_{t+1}$, suggesting that discretionary smoothing by low ability managers decreases stock price informativeness. In contrast, the coefficient on $DIS\_SMTH_{t-4,t} \times XCF_{t+1} \times HighAb_t$ is positive and significant (0.433; t = 3.99), indicating that discretionary smoothing by high ability managers improves stock price informativeness. The difference in stock price informativeness across high and low ability managers is also economically significant. As presented in Panel D, low ability managers decrease stock price informativeness through discretionary smoothing by 0.319 (i.e., a 134% decrease) when the percentile value of $DIS\_SMTH_{t-4,t}$ moves from the lowest value to the highest value. High ability managers, on the other hand, increase stock price informativeness through discretionary smoothing by 0.114 (i.e., a 43% increase).[26] In contrast to the results for discretionary smoothing, we report a *negative* and significant coefficient (-0.251; t= -2.18) on the interaction among fundamental smoothing, future cash flows, and managerial ability ($FUND\_SMTH_{t-4,t} \times XCF_{t+1} \times HighAb_t$). [27] Results in Table 5 are consistent with the notion that high

[26] Similar to alternative tests of economic significance for the results in Panel C of Table 4, we assess the coefficients across high and low values of managerial ability and smoothing when those above and below the median (instead of the lowest and highest values) of *DIS_SMTH* are used for high and low smoothing groups. The coefficient is 0.114 for low ability/low discretionary smoothing, 0.032 for low ability/high discretionary smoothing, 0.264 for high ability/low discretionary smoothing, and 0.344 for high ability/high discretionary smoothing, respectively. The difference between high ability/low discretionary smoothing and high ability/high discretionary smoothing is 0.080 (i.e., a 30% increase) and is significant at the 10% level.

[27] In untabulated analyses, we run the regression using the sum of cash flows for years t+1 to t+3 as a measure of future cash flows and find similar results. Additionally, when we use one-year-ahead earnings (instead of accruals and cash flows) or the sum of earnings for years t+1 to t+3, inferences are not affected.

ability managers use discretionary smoothing to communicate their assessment of future performance and that investors value this information. [28]

To provide corroborating evidence about the impact of smoothing by high ability managers on stock price informativeness, we follow Muslu, Radhakrishnan, Subramanyam, and Lim (2015) and use short-window returns over the earnings announcement period and non-earnings announcement period and re-run the stock price informativeness test (i.e., Equation (4)).[29] To the extent that current earnings help investors to better predict future performance, we predict that our findings are more likely to arise from short-window returns around the earnings announcement of year *t* earnings because information about current earnings becomes available from earnings announcements. When we measure stock returns over the 30-day period that starts 10 days before and ends 20 days after the annual earnings announcement date, we find that the three-way interaction among smoothing, managerial ability, and future cash flows is positive and significant (untabulated). In contrast, when we measure stock returns over the 30-day period before the earnings announcement date, the three-way interaction is insignificant (untabulated). Results from the short-window tests reinforce the notion that smoothing by high ability managers helps investors better predict future performance.

[28] It is possible that high ability managers signal their private information using real earnings management (Roychowdhury 2006; Cohen and Zarowin 2010). However, real earnings management is also potentially costly given that high ability managers have superior operational skills and that the cost of sacrificing future firm growth by reducing investments in R&D, for example, might outweigh the benefit of doing so.

[29] We thank the editor for suggesting this test.

V. ADDITIONAL TESTS

Endogeneity

We recognize that endogeneity is a potential issue that can affect our inferences because managers are not randomly assigned to firms, and firms likely select managers with specific characteristics based on a firm's needs. For example, boards of directors of firms with more volatile operating environments are likely to hire more talented managers. Francis et al. (2008) find a negative association between earnings quality and CEO reputation and conclude that their results are consistent with reputed managers being matched to firms with poor earnings quality.[30] We address the potential endogeneity issue by using a constant management sample and by examining within-firm variation in managerial ability.

Constant Management Sample

Our main results are consistent with the story that high ability managers use smoothing to signal their knowledge about their firms' future performance. However, it is possible that innate firm characteristics (e.g., volatile business environment) can also impact smoothing. To draw inferences about the influence of the management team on smoothing, it is important that our results hold with a constant management team. We therefore re-run our main tests using a sample with the same CEO and CFO across our analysis period.

To identify managerial stability, we compare CEO and CFO information (from ExecuComp and Audit Analytics) between years *t*-1 and *t* to identify CEO or CFO turnover in year

[30] While the positive relation between sales volatility and managerial ability (Panel B of Table 1) is consistent with a matching story (Francis et al. 2008), this works against finding a positive relation between income smoothing and managerial ability because a volatile business environment leads to *less* smooth earnings. Furthermore, the use of discretionary smoothing partly mitigates the concern that firms' innate operating environments affect our inferences. While these findings suggest that endogeneity ex ante does not likely affect inferences from our study, we nevertheless perform several additional test, as described below, to deal with potential endogeneity.

t. Then we exclude firms with CEO or CFO turnover over the analysis period and re-estimate the regressions. For the analyses in Equation (2), we exclude firms with CEO or CFO turnover for years t through t+4, the measurement period for our future smoothing variable ($SMTH_{t,\ t+4}$). This procedure results in 27,700 firm-year observations for the 1993-2011 period. Note that the sample period for this analysis begins in 1993 because ExecuComp and Audit Analytics coverage starts in 1992 and thus year 1993 is the earliest year for which CEO or CFO turnover can be identified. For the tests based on Equations (3) and (4), we exclude firms with CEO or CFO turnover for the years t-4 through t+1, the period over which we measure our main variables ($DIS\_SMTH_{t-4,\ t}$, CFO_{t+1}, and XCF_{t+1}). We further require the availability of information on CEO or CFO turnover for year t-4. This yields a constant management sample of 21,900 firm-year observations for the 1997-2011 period. In Panel A of Table 6, we present descriptive statistics for the sample used for tests based on Equations (3) and (4). We report a mean (median) *MA-Score* of 0.510 (0.556), similar to statistics reported for the full sample in Panel A of Table 1. We also report a mean (median) discretionary smoothing ($DIS\_SMTH_{t-4,t}$) of 0.003 (0.212), again similar to statistics reported for the full sample.

[Insert Table 6 here]

Panel B reports the results of estimating Equation (2) using the constant management sample. Consistent with the results reported in Table 3, the coefficient on *MA-Score* is positive and significant. In Panels C and D, we report the results of estimating Equations (3) and (4), respectively, using the fundamental and discretionary components of smoothing. The results are also similar to those for the full sample. Specifically, in Panel C, the coefficient on $DIS\_SMTH_{t-4,\ t}\times E_t\times HighAb_t$ is positive and significant. In Panel D, the coefficient on $DIS\_SMTH_{t-4,\ t}\times XCF_{t+1}\times HighAb_t$ is positive and significant, while the coefficient on $FUND\_SMTH_{t-4,}$

$_t \times XCF_{t+1} \times HighAb_t$ is insignificant.[31] Taken together, these results provide further support for our main findings.

Within-Firm Variation in Managerial Ability

For our second test to deal with endogeneity, we conduct a pseudo-experiment related to within-firm changes in managerial ability and examine changes in the informativeness of earnings and stock prices. Specifically, we identify firms that belonged to a high (low) ability manager group in one period but moved to a low (high) ability manager group in a subsequent period, and then compare informativeness across the two periods (i.e., pre- and post-periods). The key feature of this test is that the firms are held constant, as we require observations to be available in both periods. We predict that smoothing at firms with high ability managers improves the informativeness of earnings and stock prices, while smoothing at firms with low ability managers does not have as great an effect. For each industry-year group, we sort firms by the average value of MA-Scores over years *t*-4 through *t*-2 ($MA\text{-}Score_{t-4,\ t-2}$) and by the average value of MA-Scores over years *t*+1 through *t*+3 ($MA\text{-}Score_{t+1,\ t+3}$).[32] We classify firms in the top (bottom) half by $MA\text{-}Score_{t-4,\ t-2}$ and in the bottom (top) half by $MA\text{-}Score_{t+1,\ t+3}$ as those that moved from a high (low) ability manager group to a low (high) ability manager group. As reported in Panels A and B of Table 7, we find that smoothing by high ability managers improves the informativeness of earnings and stock prices, respectively. For example, in columns 1 and 4 of Panel A, the coefficients on $DIS\_SMTH_{t-4,\ t} \times E_t$ are significantly positive, suggesting that smoothing by high ability managers

[31] We use several alternative horizons to measure managerial ability for our full sample, including using lagged *MA-Score* (*t*-1), average *MA-Score* over three years (*t* through *t*-2), or average *MA-Score* over four years (*t* through *t*-3) in the stock price informativeness model. We find results (untabulated) similar to those reported. We also measure the smoothing variables over four years (*t* through *t*-3) and again find results (untabulated) similar to those reported.

[32] We average managerial ability over three years to identify firms that moved from a high (low) ability manager group to a low (high) ability manager group. For the pre- and post-periods, we estimate the models using observations in years *t*-2 and *t*+3, respectively.

improves earnings informativeness. In contrast, for the low ability group (Ability<Median), the coefficients on $DIS\_SMTH_{t-4,\,t} \times E_t$ are insignificant or significantly negative, as shown in columns 2 and 3 of Panel A, suggesting that smoothing by low ability managers does not enhance earnings informativeness. The results for stock price informativeness reported in Panel B yield similar inferences. As with results based on a constant management team, results using within-firm variation further corroborate our main results.

[Insert Table 7 here]

Information Asymmetry

Louis and White (2007) suggest that managers' incentive to signal private information increases with firms' information asymmetry. To test the influence of firms' information asymmetry on the level of smoothing by high ability managers, we use proxies for information asymmetry such as return volatility and cash flow volatility. We partition firms into two groups based on the median of these information asymmetry variables and classify firms with high return volatility and high cash flow volatility as those with high information asymmetry; otherwise, they are classified as those with low information asymmetry. We then re-run our main tests separately for these two groups. In untabulated results, we find that smoothing by high ability managers is more pronounced for firms with high information asymmetry. We find similar results (untabulated) for the earnings informativeness and stock price informativeness tests, suggesting that smoothing is more useful when employed by high ability managers in firms that face high levels of information asymmetry.

Alternative Signaling Channels

Our study focuses on smoothing as the channel through which managers communicate their private information. We adopt theoretical arguments from studies that assume that managers can use only earnings reports to make disclosures to the market (e.g., Sankar and Subramanyam 2001). However, in practice, managers plausibly have alternative signaling channels. For example, managers could use voluntary earnings forecasts to convey their belief about firms' future prospects, or they can use dividends or share repurchases as a means to convey information to capital markets (Gelb 2000; Louis and White 2007). Thus, it is likely that the tendency for high ability managers to use income smoothing as a signaling device increases when there are fewer alternative communication channels available to managers.[33] Consistent with this conjecture, Louis and White (2007) show that the signaling role of share repurchases decreases in the availability of alternative communication channels.

To test whether smoothing by high ability managers varies with the availability of alternative communication channels, we classify firms as those with more (fewer) available alternative communication channels based on the following four channels: (i) voluntary management forecasts, (ii) non-zero dividend payments, (iii) dividend increases, and (iv) stock repurchases.[34] We then estimate our main models separately for firms with more and fewer alternative channels. We find that our results are generally more pronounced for firms with fewer alternative signaling channels (untabulated). These results are consistent with the notion that financial reporting is used to signal private information when communication with investors is

[33] Managers optimally select a mix of signals to convey information to capital markets when multiple signals are available (Gelb 2000). For example, managers can combine smoothing and other means of signaling to strengthen the signals, or they can use smoothing alone because additional signals may be too costly to use. Untabulated results show that smaller firms, non-S&P 500 firms, firms with higher leverage, higher sales growth, negative free cash flows, lower analyst following and institutional holdings are more likely to use smoothing as a single channel. These findings suggest that financially constrained firms and less visible firms tend to choose smoothing as their only signaling channel.

[34] More specifically, we assign a score of one for the existence of each channel and then aggregate scores across all of the channels (i.e., maximum score of four). We partition firms into two groups based on the yearly median of the aggregated scores.

limited (Dye 1988; Schipper 1989).[35] Overall, these results provide corroborating evidence on the role of smoothing as a means to signal, particularly for firms that do not have several alternative signaling channels.

Alternative Model to Test the Impact of Smoothing by High Ability Managers on Earnings Informativeness

Because the accounting system provides temporary adjustments that shift the recognition of cash flows over time, current earnings are related to past, present, and future cash flows (Dechow and Dichev 2002). As an alternative test for our earnings informativeness hypothesis, we estimate a modified Dechow and Dichev (2002) model. Dechow and Dichev (2002) find a positive relation between current earnings and future cash flows and interpret this as current earnings anticipating future cash flows. We employ future cash flows as a proxy for managers' private information as of year *t* about future cash flows [36] and examine the extent to which future cash flows (i.e., forward-looking information) are incorporated into current earnings through smoothing by high ability managers. Specifically, we estimate the following regression:

[35] Because we do not examine the information content of other signals used or the combined effect of multiple signals, these results do not imply that smoothing is not useful when used with other channels. Rather, these results suggest that smoothing is a useful way for high ability managers to signal, particularly when other communication channels are limited.

[36] This view is consistent with the literature in banking (e.g., Beaver and Engel 1996; Beatty and Liao 2011) that uses one-year-ahead changes in nonperforming loans in the loan loss provision regression to examine how banks incorporate their expectations about the default exposure of loans into the determination of current loan loss provisions. For example, a positive coefficient on future changes in nonperforming loans is interpreted as a timely recognition of loan loss provisions.

$$
\begin{aligned}
E_t = {} & \gamma_0 + \gamma_1 CFO_{t-1} + \gamma_2 CFO_t + \gamma_3 CFO_{t+1} + \gamma_4 R_{t+1} + \gamma_5 DIS\_SMTH_{t-4,\,t} \\
& + \gamma_6 DIS\_SMTH_{t-4,\,t} \times CFO_{t-1} + \gamma_7 DIS\_SMTH_{t-4,\,t} \times CFO_t + \gamma_8 DIS\_SMTH_{t-4,\,t} \times CFO_{t+1} \\
& + \gamma_9 DIS\_SMTH_{t-4,\,t} \times R_{t+1} + \gamma_{10} FUND\_SMTH_{t-4,\,t} + \gamma_{11} FUND\_SMTH_{t-4,\,t} \times CFO_{t-1} \\
& + \gamma_{12} FUND\_SMTH_{t-4,\,t} \times CFO_t + \gamma_{13} FUND\_SMTH_{t-4,\,t} \times CFO_{t+1} \\
& + \gamma_{14} FUND\_SMTH_{t-4,\,t} \times R_{t+1} + \gamma_{15} HighAb_t + \gamma_{16} CFO_{t-1} \times HighAb_t + \gamma_{17} CFO_t \times HighAb_t \\
& + \gamma_{18} CFO_{t+1} \times HighAb_t + \gamma_{19} R_{t+1} \times HighAb_t + \gamma_{20} DIS\_SMTH_{t-4,\,t} \times HighAb_t \\
& + \gamma_{21} DIS\_SMTH_{t-4,\,t} \times CFO_{t-1} \times HighAb_t + \gamma_{22} DIS\_SMTH_{t-4,\,t} \times CFO_t \times HighAb_t \\
& + \gamma_{23} DIS\_SMTH_{t-4,\,t} \times CFO_{t+1} \times HighAb_t + \gamma_{24} DIS\_SMTH_{t-4,\,t} \times R_{t+1} \times HighAb_t \\
& + \gamma_{25} FUND\_SMTH_{t-4,\,t} \times HighAb_t + \gamma_{26} FUND\_SMTH_{t-4,\,t} \times CFO_{t-1} \times HighAb_t \\
& + \gamma_{27} FUND\_SMTH_{t-4,\,t} \times CFO_t \times HighAb_t + \gamma_{28} FUND\_SMTH_{t-4,\,t} \times CFO_{t+1} \times HighAb_t \\
& + \gamma_{29} FUND\_SMTH_{t-4,\,t} \times R_{t+1} \times HighAb_t + \text{Firm and Year Fixed Effects} + \varepsilon_t
\end{aligned}
\qquad \textbf{(5)}
$$

The dependent variable, E_t, is defined as income before extraordinary items for year t, deflated by lagged total assets. We follow Dechow and Dichev (2002) and include interactions with (fundamental and discretionary) smoothing and managerial ability. To the extent that smoothing by high ability managers is more informative about future performance, we expect our coefficient of interest, γ_{23}, to be positive. We further include the cumulative buy-and-hold return for year t+1 (R_{t+1}) to ensure that CFO_{t+1} captures expected cash flows. R_{t+1} controls for events occurring in the future that affect future cash flows but were not anticipated at the end of year t (Collins et al. 1994).

In untabulated results, we find that the coefficient on $DIS\_SMTH_{t-4,\,t} \times CFO_{t+1} \times HighAb_t$ is significantly positive (0.062; t = 2.89), suggesting that discretionary smoothing by high ability managers increases the extent to which current earnings incorporate information about future cash flows. In contrast, the coefficient on $FUND\_SMTH_{t-4,\,t} \times CFO_{t+1} \times HighAb_t$ is negative and insignificant (-0.020; t = -0.82), further confirming the notion that high ability managers smooth earnings to better communicate a firm's future prospects.

VI. SUMMARY AND CONCLUSIONS

We investigate whether high ability managers smooth income more than low ability managers and whether smoothing by high ability managers improves the informativeness of earnings and stock prices about future performance more than smoothing by low ability managers. Using a large sample of U.S. firms for the period 1991-2011, we find that managerial ability is positively related to income smoothing, even after controlling for other determinants of income smoothing.

To the extent that high ability managers have superior skills in assessing their firms' future performance, we expect that their discretionary accounting choices to smooth earnings will make earnings and stock prices more informative about future performance. We find evidence that high ability managers are more likely to smooth earnings to embed forward-looking information in current earnings, thus improving earnings informativeness. We also find that smoothing by high ability managers increases stock price informativeness about future cash flows. We also conduct short-window tests to corroborate the stock price informativeness tests. Self-selection is an issue in our setting and we attempt to mitigate concerns about this issue by re-running our tests using a constant management team and within-firm variation in managerial ability. Additional tests reveal that smoothing is useful when used by higher ability managers in firms with high information asymmetry and in firms with fewer alternative signaling channels. We also assess the robustness of our earnings informativeness tests using a modified Dechow and Dichev (2002) model. Taken together, our findings are consistent with the view that high ability managers use their superior skills to anticipate changes in their firms' economic prospects and use smoothing to communicate their private information.

Our findings are subject to some caveats. We acknowledge that our inferences depend on the validity of our empirical measure of managerial ability because managerial ability is unobservable and thus difficult to measure. We also acknowledge that we cannot rule out endogeneity in our study. Despite these limitations, our findings provide important insights into the determinants and usefulness of smoothing.

Appendix I
DEA Estimation

This section illustrates the estimation of firm efficiency based on Data Envelope Analysis (DEA). The DEA model in Charnes, Cooper, and Rhodes (1978) is represented as follows:

$$\max_{v,u}\theta_o = \frac{\sum_{r=1}^{s} u_r y_{ro}}{\sum_{i=1}^{m} v_i x_{io}} \qquad \text{(A1)}$$

subject to:

$$\frac{\sum_{r=1}^{s} u_r y_{rj}}{\sum_{i=1}^{m} v_i x_{ij}} \leq 1;\ \mathrm{j} = 1, \ldots, \mathrm{n}$$

$$u_r,\ v_i \geq 0;\ r=1, \ldots, \mathrm{s};\ i=1, \ldots, \mathrm{m}$$

DEA measures the efficiency of a decision making units (DMU), here firm j, relative to a set of comparable firms (n firms) by maximizing θ, the ratio of a set of outputs (y; the number of outputs=s) to a set of inputs (x; the number of inputs=m). u_r and v_i are the weights on outputs and inputs, which are determined by the solution of this problem. For each DMU, the optimization program maximizes θ by selecting the weights u_r and v_i, using data of all DMUs in the reference group (e.g., same industry). The first constraint ensures that the optimal objective value θ^* does not exceed one. By the second constraint, the weights (u_r and v_i) should be non-negative.

As a simple example, consider the following case of five DMUs with two inputs (x_1 and x_2) and one output (y), where output value is unitized to one for each DMU.[37]

Table A1. Simple example

DMU	Inputs		Output
	x_1	x_2	y
A	4	3	1
B	7	3	1
C	8	1	1
D	4	2	1
E	2	4	1

The fractional program discussed above can be re-written in terms of a linear program to obtain the optimal weights on inputs and output (v_1, v_2, and u). For example, for DMU A, the linear program for optimization can be written as follows:

$$\max \theta = u \qquad \text{(A2)}$$

$$\text{subject to } 4v_1 + 3v_2 = 1$$

[37] This example is from Cooper, Seiford, and Tone (2000).

$$u \leq 4v_1 + 3v_2\,(A),\ u \leq 7v_1 + 3v_2\,(B),\ u \leq 8v_1 + 1v_2\,(C),\ u \leq 4v_1 + 2v_2\,(D),\ u \leq 2v_1 + 4v_2\,(E)$$
$$u, v_1, v_2 \geq 0$$

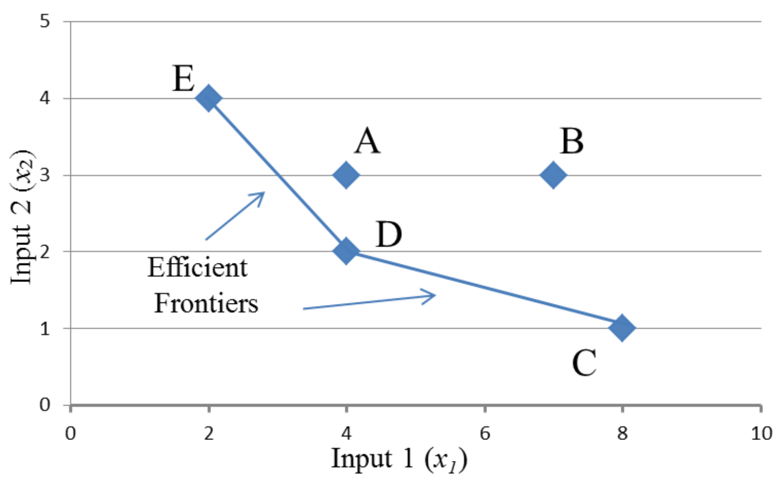
The solution to this problem is (v_1 = 0.1429, v_2 = 0.1429, u = 0.8571, θ = 0.8571). Likewise, solutions for other DMUs can be obtained as follows:

Table A2. The results from DEA

DMU	Inputs		Output	Weights on inputs		Weight on output	Efficiency score (θ)
	x_1	x_2	y	v_1	v_2	u	
A	4	3	1	0.1429	0.1429	0.8571	0.8571
B	7	3	1	0.0526	0.2105	0.6316	0.6316
C	8	1	1	0.0833	0.3333	1	1
D	4	2	1	0.1667	0.1667	1	1
E	2	4	1	0.2143	0.1429	1	1

We plot the efficient frontier estimated from the example. DMUs C, D, and E that are on the frontier (i.e., efficient units), and they have the efficiency score of one. DMUs A and B that are above the frontier (i.e., inefficient) have the efficiency score of less than one.

Figure A1. Efficient Frontier



To estimate the firm-level efficiency based on DEA for our sample, we follow Demerjian et al. (2012, 2013) and solve the following optimization problem.

$$\max \theta = \frac{Sales}{v1CoGS + v2SG\&A + v3PPE + v4OpsLease + v5R\&D + v6Goodwill + v7OtherIntan} \quad \text{(A3)}$$

We compute DEA efficiency by Fama-French industry for the sample period of 1991-2011. Variable measurements for inputs and output are provided in Appendix II. For more details for the estimation of DEA efficiency and managerial ability measures, see Demerjian et al. (2012).

Appendix II
Definitions of Variables

Variable	Definition
Firm efficiency	Firm efficiency based on Data Envelopment Analysis (DEA) using seven inputs and one output: • Inputs: net PP&E (PPENT) at the beginning of the fiscal year; cost of goods sold (COGS); selling, general, and administrative expenses (XSGA), capitalized operating leases calculated as the discount present value of the next five years of required operating lease payments (MRC1-MRC5) using a discount rate of 10 percent; capitalized R&D costs, calculated following Lev and Sougiannis (1996); purchased goodwill (GDWL); and other acquired and capitalized intangibles (INTAN- GDWL). • Output: revenues (SALE)
MA-Score	The decile rank (by industry and year) of managerial efficiency (the residual from Equation (1)), with a value between 0 and 1.
Firm size	The natural log of the firm's assets (AT) at the end of year *t*.
Market share	The percentage of revenues (SALE) of the firm by Fama-French industry in year *t*.
Positive free cash flow	An indicator variable that equals one when a firm has non-negative free cash flows (OANCF-CAPX), and zero otherwise.
Age	The natural log of the number of years since the firm was first covered by Compustat.
Business Segment Concentration	The sum of the squares of each segment's sales in year *t* as a percentage of total firm sales. If the firm is not in the segment file, it is assigned a concentration of one.
Foreign currency Indicator	An indicator variable that equals one when a firm reports a non-zero value for foreign currency adjustment (FCA) in year *t*, and zero otherwise.
$SMTH1_{t,t+4\,(t-4,\,t)}$	The standard deviation of operating earnings (OIADP) divided by the standard deviation of cash flows from operations (OANCF), where earnings and cash flows are scaled by lagged total assets. The standard deviation is calculated over at least three of the five years (t, t+4) for $SMTH1_{t,t+4}$ and (t-4, t) for $SMTH1_{t-4,\,t}$. For easier interpretation, *SMTH1* is multiplied by negative one.
$SMTH2_{t,t+4\,(t-4,\,t)}$	The Spearman correlation between the change in total accruals (IB-OANCF) and the change in cash flows from operations (OANCF) (both scaled by lagged total assets). The correlation is calculated over at least three of the five years (t, t+4) for $SMTH2_{t,t+4}$ and (t-4, t) for $SMTH2_{t-4,\,t}$. For easier interpretation, *SMTH2* is multiplied by negative one.
$SMTH3_{t,t+4\,(t-4,\,t)}$	The Spearman correlation between the change in discretionary accruals and the change in pre-managed income. Discretionary accruals are estimated from the cross-sectional version of the Jones model. Pre-managed income is calculated as net income minus discretionary accruals. The correlation is calculated over at least three of the five years (t, t+4) for $SMTH3_{t,t+4}$ and (t-4, t) for $SMTH3_{t-4,\,t}$. For easier interpretation, *SMTH3* is multiplied by negative one.

$SMTH_{t,t+4\ (t\text{-}4,\ t)}$	The common factor identified by factor analysis on the three measures of income smoothing: $SMTH1_{t,t+4\ (t\text{-}4,\ t)}$, $SMTH2_{t,t+4\ (t\text{-}4,\ t)}$, and $SMTH3_{t,t+4\ (t\text{-}4,\ t)}$.
$DIS\_SMTH_{t,t+4\ (t\text{-}4,\ t)}$ ($FUND\_SMTH_{t,t+4\ (t\text{-}4,\ t)}$)	Discretionary (Fundamental) component of income smoothing, defined as the residual (predicted) value from the following regression (Lang et al. 2012): $SMTH_{t,\ t+4\ (t\text{-}4,\ t)} = \eta_0 + \eta_1\, Firm\ size_t + \eta_2\, Leverage_t + \eta_3\, BM\ ratio_t + \eta_4\, Sales\ volatility_t + \eta_5\, LOSS\%_t + \eta_6\, Operating\ cycle_t + \eta_7\, Sales\ growth_t + \eta_8\, Operating\ leverage_t + \eta_9\, AvgCFO_t + \sum_t Year_t + \sum_k Industry_k + \varepsilon_t$
Leverage	Leverage, defined as total liabilities (LT) divided by total assets (AT).
BM ratio	Book-to-market ratio, defined as the natural log of book value of equity (CEQ) divided by market value of equity (PRCC_F×CSHO).
Sales volatility	The standard deviation of sales (SALE) scaled by lagged total assets (AT), over at least three of the last five years (t-4, t).
Loss%	The percentage of years reporting losses in net income (IB) over at least three of the last five years (t-4, t).
Operating cycle	The natural log of the length of the firm's operating cycle: (Sale/360)/(average accounts receivable (RECT)) + (COGS/360)/(average Inventory (INVT)) and is averaged over at least three of the last five years (t-4, t).
Sales growth	The annual change in revenues defined as $(Sales_t - Sales_{t-1})/Sales_{t-1}$.
Operating leverage	Net property, plant, and equipment (PPENT) divided by total assets (AT).
AvgCFO	Average cash flows from operations (OANCF) scaled by lagged total assets, measured over the last five years (t-4, t).
E_t	Income before extraordinary items (IB) for year t, deflated by lagged total assets.
CFO_t	Operating cash flows (OANCF) for year t, deflated by lagged total assets.
R_t	The cumulative buy-and-hold return for fiscal year t.
XAC_t	Accruals (IB-OANCF) for year t, deflated by lagged market value of equity
XCF_t	Operating cash flows (OANCF) for year t, deflated by lagged market value of equity
Historical returns	Five-year historical value-weighted industry-adjusted stock returns over years t-4 to t.
Historical ROA	Five-year historical average of industry-adjusted ROA over years t-4 to t, where ROA is net income (IB) scaled by lagged total assets (AT).

Compustat XPF names are presented in the parentheses.

References

Baik, B., J. Chae, S. Choi, and D. B. Farber. 2013. Changes in operational efficiency and firm performance: A frontier approach. *Contemporary Accounting Research* 30 (3): 996-1026.

Baik, B., D. B. Farber, and S. Lee. 2011. CEO ability and management earnings forecasts. *Contemporary Accounting Research* 28 (5): 1645-1668.

Ball, R., and L. Shivakumar. 2006. The role of accruals in asymmetrically timely gain and loss recognition. *Journal of Accounting Research* 44 (2): 207-242.

Barnea, A., J. Ronen, and S. Sadan. 1976. Classificatory smoothing of income with extraordinary items. *The Accounting Review* 51 (1): 110-122.

Beatty, A., and S. Liao. 2011. Do delays in expected loss recognition affect banks' willingness to lend? *Journal of Accounting and Economics* 52 (1): 1-20.

Beaver, W. H., and E. E. Engel. 1996. Discretionary behavior with respect to allowances for loan losses and the behavior of security prices. *Journal of Accounting and Economics* 22 (1-3): 177-206.

Beidleman, C. R. 1973. Income smoothing: The role of management. *The Accounting Review* 48 (4): 653-667.

Bhattacharya, U., H. Daouk, and M. Welker. 2003. The world price of earnings opacity. *The Accounting Review* 78 (3): 641-678.

Biddle, G. C., and G. Hilary. 2006. Accounting quality and firm-level capital investment. *The Accounting Review* 81 (5): 963-982.

Chaney, P., Jeter, D., and C. M. Lewis. 1998. The use of accruals in income smoothing: A permanent earnings hypothesis. *Advances in Quantitative Analysis of Finance & Accounting* 6: 103–135.

Chaney, P. K., and C. M. Lewis. 1995. Earnings management and firm valuation under asymmetric information. *Journal of Corporate Finance* 1 (1): 319-345.

Charnes, A., W. W. Cooper, and E. Rhodes. 1978. Measuring the efficiency of decision making units. *European Journal of Operational Research* 2: 429-444.

Choi, J.-H., L. A. Myers, Y. Zang, and D. Ziebart. 2011. Do management EPS forecasts allow returns to reflect future earnings? Implications for the continuation of management's quarterly earnings guidance. *Review of Accounting Studies* 16 (1): 143-182.

Coff, R. W. 1999. When competitive advantage doesn't lead to performance: The resource-based view and stakeholder bargaining power. *Organization Science* 10 (2): 119–133.

Cohen, D. A., and P. Zarowin. 2010. Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics* 50 (1): 2-19.

Collins, D. W., S. P. Kothari, J. Shanken, and R. G. Sloan. 1994. Lack of timeliness and noise as explanations for the low contemporaneous return-earnings association. *Journal of Accounting and Economics* 18 (3): 289-324.

Cooper, W.W., L. M. Seiford, and K. Tone. 2000. *Data envelopment analysis: A comprehensive text with models, applications, references and DEA-Solver software*. Kluwer Academic Publishers.

Dascher, P. E., and R. E. Malcom. 1970. A note on income smoothing in the chemical industry. *Journal of Accounting Research* 8 (2): 253-259.

Dechow, P. M., and I. D. 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 (2-3): 344-401.

DeFond, M., M. Hung, and R. Trezevant. 2007. Investor protection and the information content of annual earnings announcements: International evidence. *Journal of Accounting and Economics* 43 (1): 37-67.

Demerjian, P., B. Lev, and S. McVay. 2012. Quantifying managerial ability: A new measure and validity tests. *Management Science* 58 (7): 1229-1248.

Demerjian, P. R., B. Lev, M. Lewis, and S. E. McVay. 2013. Managerial abilty and earnings quality. *The Accounting Review* 88 (2): 463-498.

Demerjian, P. R., M. Lewis, and S. E. McVay. 2017. How does intential earnings smoothing vary with managerial ability? Working paper, University of Washington and Brigham Young University.

Demski, J. S., 1998. Performance measure manipulation. *Contemporary Accounting Research* 15 (3): 261-285.

Dou, Y., O.-K. Hope, and W. B. Thomas. 2013. Relationship-specificity, contract enforceability, and income smoothing. *The Accounting Review* 88 (5): 1629-1656.

Durnev, A., R. Morck, B. Yeung, and P. Zarowin. 2003. Does greater firm-specific return variation mean more or less informed stock pricing? *Journal of Accounting Research* 41 (5): 797-836.

Dye, R. A. 1988. Earnings management in an overlapping generations model. *Journal of Accounting Research* 26 (2): 195-235.

Falato, A., D. Li, and T. Milbourn. 2012. Which skills matter in the market for CEOs? Evidence from pay for CEO credentials. Working Paper, Federal Reserve Board and Washington University in St Louis.

Fernandes, N., and M. A. Ferreira. 2009. Insider trading laws and stock price informativeness. *Review of Financial Studies* 22 (5): 1845-1887.

Financial Accounting Standards Board (FASB). 2010. Statement of Financial Accounting Concepts No. 8: *Conceptual Framework for Financial Reporting.*

Francis, J., A. H. Huang, S. Rajgopal, and A. Y. Zang. 2008. CEO reputation and earnings quality. *Contemporary Accounting Research* 25 (1): 109-147.

Fudenberg, D., and J. Tirole. 1995. A theory of income and dividend smoothing based on incumbency rents. *Journal of Political Economy* 103 (1): 75-93.

Gelb, D. S. 2000. Corporate signaling with dividends, stock repurchases, and accounting disclosures: An empirical study. *Journal of Accounting, Auditing & Finance* 15 (2): 99-120.

Graham, J., H. Campbell, and S. Rajgopal. 2005. The economic implications of corporate financial reporting. *Journal of Accounting and Economics* 40 (1-3): 3-73.

Graham, J., S. Li, and J. Qiu. 2012. Managerial attributes and executive compensation. *Review of Financial Studies* 25 (1): 144-186.

Hjalmarsson, E. 2011. New methods for inference in long-horizon regression. *Journal of Financial and Quantitative Analysis* 46 (3): 815-839.

Holcomb, T. R., R. M. Holmes Jr., and B. L. Connelly. 2009. Making the most of what you have: Managerial ability as a source of resource value creation. *Strategic Management Journal* 30 (5): 457-485.

Jones, J. J. 1991. Earnings management during import relief investigations. *Journal of Accounting Research* 29(2): 193-228.

Kanagaretnam, K., G. L. Lobo, and D. H. Yang. 2004. Joint tests of signaling and income smoothing through bank loan loss provisions. *Contemporary Accounting Research* 21 (4): 843-884.

Kirschenheiter, M., and N. D. Melumad. 2004. Earnings quality and smoothing. Working paper, Columbia University.

LaFond, R. 2008. Discussion of CEO reputation and earnings quality. *Contemporary Accounting Research* 25 (1):149-156.

Lang, M., K. V. Lins, and M. Maffett. 2012. Transparency, liquidity, and valuation: International evidence on when transparency matters most. *Journal of Accounting Research* 50 (3): 729-774.

Leuz, C., D. Nanda, and P. D. Wysocki. 2003. Earnings management and investor protection: An international comparison. *Journal of Financial Economics* 69 (3): 505-527.

Lev, B., and T. Sougiannis. 1996. The capitalization, amortization, and value-relevance of R&D. *Journal of Accounting and Economics* 21 (1): 107-138.

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

Louis, H., and H. White. 2007. Do managers intentionally use repurchase tender offers to signal private information? Evidence from firm financial reporting behavior. *Journal of Financial Economics* 85 (1): 205-233.

Lundholm, R. J., and L. A. Myers. 2002. Bringing the future forward: The effect of disclosure on the returns-earnings relation. *Journal of Accounting Research* 40 (3): 809-839.

Malmendier, U., and G. Tate. 2009. Superstar CEOs. *The Quarterly Journal of Economics* 124 (4): 1593-1638.

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

Muslu, V., S. Radhakrishnan, K. R. Subramanyam, and D. Lim. 2015. Forward-looking MD&A disclosure and the information environment. *Management Science* 61(5): 931-948.

Orpurt, S. F., and Y. Zang. 2009. Do direct cash flow disclosures help predict future operating cash flows and earnings? *The Accounting Review* 84 (3): 893-935.

Rajgopal, S., T. Shevlin, and V. Zamora. 2006. CEOs' outside employment opportunities and the lack of relative performance evaluation in compensation contracts. *Journal of Finance* 61 (4): 1813-1844.

Ronen, J., and S. Sadan. 1981. *Smoothing income numbers: Objectives, means, and implications*. Reading, MA: Addison-Wesley.

Roychowdhury, S. 2006. Earnings management through real activities manipulation. *Journal of Accounting and Economics* 42 (3): 335-370.

Sankar, M. R., Subramanyam, K. R. 2001. Reporting discretion and private information communication through earnings. *Journal of Accounting Research* 39 (2): 365-386.

Schipper, K. 1989. Commentary on earnings management. *Accounting Horizons* 3: 91-102.

Schipper, K., and L. Vincent. 2003. Earnings quality. *Accounting Horizons* 17 (Supplement): 97-110.

Spence, M. 1973. Job market signaling. *The Quarterly Journal of Economics* 87 (3): 355-374.

Subramanyam, K. R. 1996. The pricing of discretionary accruals. *Journal of Accounting and Economics* 22 (1-3): 249-281.

Tucker, J. W. and P. A. Zarowin. 2006. Does income smoothing improve earnings informativeness? *The Accounting Review* 81 (1): 251-270.

TABLE 1
Descriptive Statistics

Panel A. Descriptive statistics for the full sample (N = 43,322)

Variable	Mean	Std. Dev.	Q1	Median	Q3
Firm efficiency	0.519	0.244	0.333	0.547	0.709
MA-Score	0.502	0.315	0.222	0.556	0.778
$SMTH_{t,t+4}$	0.000	1.000	-0.487	0.312	0.747
$FUND\_SMTH_{t,t+4}$	0.000	0.352	-0.217	0.037	0.257
$DIS\_SMTH_{t,t+4}$	0.000	0.936	-0.442	0.253	0.644
$SMTH_{t-4,t}$	0.000	1.000	-0.474	0.319	0.742
$FUND\_SMTH_{t-4,t}$	0.000	0.422	-0.262	0.078	0.304
$DIS\_SMTH_{t-4,t}$	0.000	0.906	-0.400	0.227	0.588
Firm size	5.512	2.147	3.898	5.396	6.963
Leverage	0.453	0.210	0.285	0.454	0.607
BM ratio	-0.581	0.925	-1.137	-0.581	-0.043
Sales volatility	0.313	0.338	0.112	0.207	0.381
Loss%	0.279	0.322	0.000	0.200	0.400
Operating cycle	4.714	0.730	4.359	4.790	5.171
Sales growth	0.108	0.361	-0.036	0.067	0.188
Operating leverage	0.281	0.226	0.103	0.215	0.402
AvgCFO	0.068	0.150	0.031	0.085	0.138
E_t	0.012	0.168	-0.018	0.039	0.089
CFO_t	0.074	0.149	0.022	0.084	0.147
CFO_{t+1}	0.084	0.183	0.021	0.089	0.160
CFO_{t-1}	0.063	0.140	0.020	0.080	0.135
XCF_{t-1}	0.122	0.315	0.020	0.079	0.160
XAC_{t-1}	-0.147	0.403	-0.145	-0.047	-0.006
XCF_t	0.139	0.326	0.022	0.085	0.173
XAC_t	-0.134	0.335	-0.152	-0.052	-0.008
XCF_{t+1}	0.149	0.353	0.023	0.091	0.186
XAC_{t+1}	-0.127	0.326	-0.152	-0.056	-0.010
R_t	0.187	0.747	-0.236	0.056	0.392
R_{t+1}	0.174	0.719	-0.228	0.056	0.375
Historical ROA	0.398	0.782	0.064	0.162	0.408
Historical returns	0.050	1.927	-0.875	-0.280	0.473

TABLE 1 (Cont'd)

Panel B. Means of the variables across high and low managerial ability

	High Ability Managers (N = 21,839)	Low Ability Managers (N = 21,483)	Difference
Variable	Mean	Mean	
Firm efficiency	0.598	0.438	0.161***
MA-Score	0.773	0.225	0.548***
$SMTH_{t,t+4}$	0.077	-0.078	0.155***
$FUND\_SMTH_{t,t+4}$	0.042	-0.042	0.084***
$DIS\_SMTH_{t,t+4}$	0.035	-0.036	0.071***
$SMTH_{t-4,t}$	0.078	-0.080	0.158***
$FUND\_SMTH_{t-4,t}$	0.051	-0.052	0.103***
$DIS\_SMTH_{t-4,t}$	0.027	-0.028	0.055***
Firm size	5.467	5.558	-0.091***
Leverage	0.446	0.461	-0.016***
BM ratio	-0.633	-0.527	-0.106***
Sales volatility	0.338	0.288	0.050***
Loss%	0.223	0.335	-0.112***
Operating cycle	4.667	4.762	-0.096***
Sales growth	0.146	0.069	0.077***
Operating leverage	0.274	0.288	-0.014***
AvgCFO	0.087	0.048	0.039***
E_t	0.054	-0.030	0.084***
CFO_t	0.097	0.050	0.047***
CFO_{t+1}	0.112	0.055	0.057***
CFO_{t-1}	0.085	0.041	0.043***
XCF_{t-1}	0.135	0.108	0.027***
XAC_{t-1}	-0.126	-0.168	0.043***
XCF_t	0.149	0.128	0.021***
XAC_t	-0.103	-0.165	0.063***
XCF_{t+1}	0.168	0.130	0.039***
XAC_{t+1}	-0.114	-0.140	0.026***
R_t	0.236	0.137	0.099***
R_{t+1}	0.174	0.175	0.000
Historical ROA	0.429	0.367	0.062***
Historical returns	0.314	-0.218	0.532***

Panel A of the table reports descriptive statistics for variables used in our analysis for the full sample. Panel B summarizes the mean value of each variable separately for high and low ability groups. The sample is partitioned into high and low ability managers based on the median of *MA-Score*. The sample is comprised of 43,322 observations for the years 1991 to 2011. *** denotes significance at the 0.01 level. See Appendix II for the definitions of the variables.

TABLE 2
Correlations between Smoothing and Managerial Ability

	$SMTH_{t,t+4}$	$FUND\_SMTH_{t,t+4}$	$DIS\_SMTH_{t,t+4}$	$SMTH_{t-4,t}$	$FUND\_SMTH_{t-4,t}$	$DIS\_SMTH_{t-4,t}$	*Historical ROA*	*Historical returns*
MA-Score	0.10***	0.15***	0.05***	0.10***	0.15***	0.04***	0.24***	0.21***
	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
$SMTH_{t,t+4}$		0.35***	0.94***	0.33***	0.33***	0.22***	0.18***	0.12***
		(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
$FUND\_SMTH_{t,t+4}$			0.00	0.40***	0.94***	0.00	0.46***	0.24***
			(1.00)	(<0.01)	(<0.01)	(1.00)	(<0.01)	(<0.01)
$DIS\_SMTH_{t,t+4}$				0.21***	0.00	0.23***	0.02***	0.04***
				(<0.01)	(1.00)	(<0.01)	(<0.01)	(<0.01)
$SMTH_{t-4,t}$					0.42***	0.91***	0.23***	0.16***
					(<0.01)	(<0.01)	(<0.01)	(<0.01)
$FUND\_SMTH_{t-4,t}$						0.00	0.49***	0.26***
						(1.00)	(<0.01)	(<0.01)
$DIS\_SMTH_{t-4,t}$							0.02***	0.06***
							(<0.01)	(<0.01)
Historical ROA								0.47***
								(<0.01)

This table presents the Pearson correlation coefficients between *MA-Score*, various measures of income smoothing, and alternative measures of managerial ability. The sample is comprised of 43,322 observations for the years 1991 to 2011. *** denotes significance at the 0.01 level. See Appendix II for the definitions of the variables.

TABLE 3
Impact of Managerial Ability on Smoothing

	Dependent variable = $SMTH_{t,t+4}$	
	(1)	
	Coefficients	*t*-value
MA-Score	0.082***	(4.25)
Firm size	-0.061***	(-6.71)
Leverage	0.108***	(3.05)
BM ratio	0.006	(0.79)
Sales volatility	-0.083***	(-4.73)
Loss%	-0.186***	(-7.65)
Operating cycle	-0.094***	(-4.67)
Sales growth	-0.023**	(-1.97)
Operating leverage	-0.155***	(-2.80)
AvgCFO	0.163***	(2.90)
Firm and Year Fixed effects	Included	
R^2	56.82%	
N	43,322	

This table reports the regression results of income smoothing ($SMTH_{t,t+4}$) on managerial ability and controls. *MA-Score* is the decile rank of managerial ability by industry and year. We include firm and year fixed effects in the model but do not report them in the table for brevity. The sample is comprised of 43,322 observations from Compustat for the years 1991 to 2011. All tests are two-tailed. *, **, and *** denote significance at the 0.1, 0.05 and 0.01 levels, respectively. See Appendix II for the definitions of the variables.

TABLE 4
Impact of Smoothing by High Ability Managers on Current Earnings Informativeness about Future Cash Flows

Panel A. Analysis based on total smoothing

	Dependent variable = CFO_{t+1}					
	(1)		(2)		(3)	
	Coefficients	*t*-value	Coefficients	*t*-value	Coefficients	*t*-value
E_t	0.367***	(62.77)	0.342***	(39.84)	0.345***	(31.93)
CFO_{t-1}	0.082***	(11.41)	0.160***	(13.52)	0.148***	(10.01)
$SMTH_{t-4,\,t}$			0.009**	(2.51)	0.011**	(2.46)
$SMTH_{t-4,\,t}{\times}E_t$			0.075***	(3.54)	-0.053*	(-1.90)
$SMTH_{t-4,\,t}{\times}CFO_{t-1}$			-0.176***	(-8.28)	-0.143***	(-4.96)
$HighAb_t$					0.014***	(4.13)
$E_t{\times}HighAb_t$					-0.020	(-1.13)
$CFO_{t-1}{\times}HighAb_t$					0.018	(0.84)
$SMTH_{t-4,\,t}{\times}HighAb_t$					-0.014**	(-2.29)
$SMTH_{t-4,\,t}{\times}E_t{\times}HighAb_t$					0.274***	(6.43)
$SMTH_{t-4,\,t}{\times}CFO_{t-1}{\times}HighAb_t$					-0.055	(-1.32)
Firm and Year Fixed Effects	Included		Included		Included	
R^2	59.95%		60.02%		60.15%	
N	43,322		43,322		43,322	

Panel B. The coefficient on current earnings (E_t) across high and low values of managerial ability and smoothing

		Low ability		High ability		*Difference test*
Low smoothing	(A)	0.345*** (<0.0001)	(B)	0.325*** (<0.0001)	(B) – (A)	-0.020 (0.258)
High smoothing	(C)	0.292*** (<0.0001)	(D)	0.546*** (<0.0001)	(D) – (C)	0.254*** (<0.0001)
Difference test	(C) –(A)	-0.053* (0.057)	(D) –(B)	0.221*** (<0.0001)		

Panel C. Analysis based on fundamental and discretionary smoothing

	Dependent variable = CFO_{t+1}			
	(1)		(2)	
	Coefficients	*t*-value	Coefficients	*t*-value
E_t	0.362***	(32.94)	0.400***	(29.29)
CFO_{t-1}	0.198***	(13.61)	0.167***	(9.19)
$DIS\_SMTH_{t-4,\,t}$	0.013***	(4.35)	0.009**	(2.16)
$DIS\_SMTH_{t-4,\,t}{\times}E_t$	0.090***	(5.35)	-0.037*	(-1.71)
$DIS\_SMTH_{t-4,\,t}{\times}CFO_{t-1}$	-0.122***	(-6.23)	-0.060**	(-2.30)
$FUND\_SMTH_{t-4,\,t}$	-0.008	(-1.64)	0.012**	(1.99)
$FUND\_SMTH_{t-4,\,t}{\times}E_t$	-0.132***	(-5.22)	-0.290***	(-8.44)
$FUND\_SMTH_{t-4,\,t}{\times}CFO_{t-1}$	-0.163***	(-6.55)	-0.205***	(-5.95)
$HighAb_t$			0.023***	(5.02)
$E_t{\times}HighAb_t$			-0.098***	(-4.23)
$CFO_{t-1}{\times}HighAb_t$			0.055**	(1.99)
$DIS\_SMTH_{t-4,\,t}{\times}HighAb_t$			-0.002	(-0.30)

$DIS\_SMTH_{t-4,\,t} \times E_t \times HighAb_t$			0.319***	(9.22)
$DIS\_SMTH_{t-4,\,t} \times CFO_{t-1} \times HighAb_t$			-0.114***	(-2.95)
$FUND\_SMTH_{t-4,\,t} \times HighAb_t$			-0.038***	(-5.54)
$FUND\_SMTH_{t-4,\,t} \times E_t \times HighAb_t$			0.233***	(4.70)
$FUND\_SMTH_{t-4,\,t} \times CFO_{t-1} \times HighAb_t$			0.060	(1.29)
Firm and Year Fixed Effects	Included		Included	
R^2	60.15%		60.42%	
N	43,322		43,322	

Panel D. The coefficient on current earnings (E_t) across high and low values of managerial ability and discretionary and fundamental smoothing

		Low ability		High ability		*Difference test*
Low discretionary smoothing	(A')	0.400*** (<0.0001)	(B')	0.302*** (<0.0001)	(B') – (A')	0.098*** (<0.0001)
High discretionary smoothing	(C')	0.363*** (<0.0001)	(D')	0.584*** (<0.0001)	(D') – (C')	0.221*** (<0.0001)
Difference test	(C') –(A')	-0.037* (0.087)	(D') –(B')	0.282*** (<.0001)		
		Low ability		High ability		*Difference test*
Low fundamental smoothing	(A")	0.040*** (<0.0001)	(B")	0.302*** (<0.0001)	(B") – (A")	-0.098 (<0.0001)
High fundamental smoothing	(C")	0.110*** (0.001)	(D")	0.245*** (<0.0001)	(D") – (C")	0.135*** (<0.0001)
Difference test	(C") –(A")	-0.290*** (<0.0001)	(D") –(B")	-0.057 (0.135)		

Panels A and C of this table report the regression results of future cash flows on current earnings with the interactions of smoothing (fundamental and discretionary smoothing) and managerial ability (*HighAb*). The dependent variable is one-year-ahead cash flows, measured as cash flows from operations scaled by lagged total assets. *HighAb* takes the value of one if *MA-Score* is above the median, and zero otherwise. We use the percentile rank that takes a value between zero and one for $SMTH_{t-4,\,t}$, $DIS\_SMTH_{t-4,\,t}$, and $FUND\_SMTH_{t-4,\,t}$. We include firm and year fixed effects in the model but do not report them in the table for brevity. The sample is comprised of 43,322 observations from Compustat for the years 1991 to 2011. Panels B and D present the estimated coefficient on current earnings (E_t) across high and low values of managerial ability and smoothing, along with *p*-values in parentheses. Specifically, for Panel B, we use the lowest and highest values of $HighAb_t$ (i.e., 0/1) and the lowest and highest values of $SMTH_{t-4,\,t}$ (i.e., 0/1) along with the estimated coefficients in column 3 of Panel A. For Panel D, we use the lowest and highest values of $HighAb_t$ (i.e., 0/1) and the lowest and highest values of $DIS\_SMTH_{t-4,\,t}$ and $FUND\_SMTH_{t-4,\,t}$ (i.e., 0/1) along with the estimated coefficients in column 2 of Panel C. All tests are two-tailed. *, **, and *** denote significance at the 0.1, 0.05 and 0.01 levels, respectively. See Appendix II for the definitions of the variables.

TABLE 5
Impact of Smoothing by High Ability Managers
on Stock Price Informativeness about Future Cash Flows

Panel A. Analysis based on total smoothing

	Dependent variable = R_t					
	(1)		(2)		(3)	
	Coefficients	*t*-value	Coefficients	*t*-value	Coefficients	*t*-value
XAC_{t-1}	-0.282***	(-13.75)	-0.166***	(-6.14)	-0.130***	(-4.23)
XAC_t	0.313***	(11.26)	0.236***	(6.02)	0.170***	(3.69)
XAC_{t+1}	0.105***	(4.04)	-0.032	(-0.88)	-0.080*	(-1.82)
XCF_{t-1}	-0.306***	(-12.74)	-0.478***	(-12.74)	-0.514***	(-11.05)
XCF_t	0.497***	(16.75)	0.580***	(12.54)	0.579***	(9.87)
XCF_{t+1}	0.137***	(5.14)	0.224***	(5.74)	0.217***	(4.32)
R_{t+1}	-0.317***	(-25.75)	-0.308***	(-20.85)	-0.288***	(-17.07)
$SMTH_{t-4,\,t}$			0.120***	(7.08)	0.121***	(5.51)
$SMTH_{t-4,\,t} \times XAC_{t-1}$			-0.231***	(-5.00)	-0.164***	(-2.65)
$SMTH_{t-4,\,t} \times XAC_t$			0.150**	(2.49)	0.240***	(2.89)
$SMTH_{t-4,\,t} \times XAC_{t+1}$			0.281***	(5.26)	0.199***	(2.74)
$SMTH_{t-4,\,t} \times XCF_{t-1}$			0.219***	(3.55)	0.430***	(5.09)
$SMTH_{t-4,\,t} \times XCF_t$			-0.086	(-1.24)	-0.041	(-0.41)
$SMTH_{t-4,\,t} \times XCF_{t+1}$			-0.125**	(-2.14)	-0.261***	(-3.07)
$SMTH_{t-4,\,t} \times R_{t+1}$			-0.019	(-1.15)	-0.019	(-0.86)
$HighAb_t$					0.148***	(9.08)
$XAC_{t-1} \times HighAb_t$					-0.098***	(-2.64)
$XAC_t \times HighAb_t$					0.135**	(2.34)
$XAC_{t+1} \times HighAb_t$					0.139**	(2.55)
$XCF_{t-1} \times HighAb_t$					0.069	(1.07)
$XCF_t \times HighAb_t$					-0.010	(-0.13)
$XCF_{t+1} \times HighAb_t$					0.016	(0.25)
$R_{t+1} \times HighAb_t$					-0.039**	(-2.39)
$SMTH_{t-4,\,t} \times HighAb_t$					-0.014	(-0.51)
$SMTH_{t-4,\,t} \times XAC_{t-1} \times HighAb_t$					-0.109	(-1.22)
$SMTH_{t-4,\,t} \times XAC_t \times HighAb_t$					-0.235*	(-1.97)
$SMTH_{t-4,\,t} \times XAC_{t+1} \times HighAb_t$					0.124	(1.20)
$SMTH_{t-4,\,t} \times XCF_{t-1} \times HighAb_t$					-0.425***	(-3.53)
$SMTH_{t-4,\,t} \times XCF_t \times HighAb_t$					-0.100	(-0.72)
$SMTH_{t-4,\,t} \times XCF_{t+1} \times HighAb_t$					0.256**	(2.24)
$SMTH_{t-4,\,t} \times R_{t+1} \times HighAb_t$					0.013	(0.41)
Control variables and their interactions	Included		Included		Included	
Firm and Year Fixed Effects	Included		Included		Included	
R^2	47.83%		48.11%		48.55%	
N	43,322		43,322		43,322	

Table 5 (Cont'd)

Panel B. The coefficient on future cash flows (CFO_{t+1}) across high and low values of managerial ability and smoothing

		Low ability		High ability		*Difference test*
Low smoothing	(A)	0.217*** (<0.0001)	(B)	0.233*** (<0.0001)	(B) – (A)	0.016 (0.801)
High smoothing	(C)	-0.044 (0.437)	(D)	0.228*** (<0.0001)	(D) – (C)	0.272*** (0.0001)
Difference test	(C) –(A)	-0.261*** (0.002)	(D) –(B)	-0.005 (0.949)		

Panel C. Analysis based on fundamental and discretionary smoothing

	Dependent variable = R_t			
	(1)		(2)	
	Coefficients	*t*-value	Coefficients	*t*-value
XAC_{t-1}	-0.219***	(-6.50)	-0.187***	(-4.78)
XAC_t	0.340***	(6.60)	0.230***	(3.88)
XAC_{t+1}	-0.185***	(-3.97)	-0.223***	(-3.98)
XCF_{t-1}	-0.628***	(-12.76)	-0.691***	(-11.22)
XCF_t	0.881***	(14.21)	0.815***	(10.26)
XCF_{t+1}	0.277***	(5.39)	0.238***	(3.55)
R_{t+1}	-0.318***	(-18.83)	-0.297***	(-15.01)
$DIS\_SMTH_{t-4,t}$	0.117***	(7.69)	0.098***	(4.89)
$DIS\_SMTH_{t-4,t} \times XAC_{t-1}$	-0.294***	(-7.51)	-0.217***	(-4.31)
$DIS\_SMTH_{t-4,t} \times XAC_t$	0.202***	(3.82)	0.183***	(2.62)
$DIS\_SMTH_{t-4,t} \times XAC_{t+1}$	0.193***	(4.00)	0.053	(0.81)
$DIS\_SMTH_{t-4,t} \times XCF_{t-1}$	0.157***	(2.75)	0.358***	(4.70)
$DIS\_SMTH_{t-4,t} \times XCF_t$	-0.034	(-0.52)	-0.053	(-0.59)
$DIS\_SMTH_{t-4,t} \times XCF_{t+1}$	-0.092*	(-1.67)	-0.319***	(-4.09)
$DIS\_SMTH_{t-4,t} \times R_{t+1}$	-0.011	(-0.75)	-0.008	(-0.43)
$FUND\_SMTH_{t-4,t}$	-0.047*	(-1.95)	-0.031	(-1.10)
$FUND\_SMTH_{t-4,t} \times XAC_{t-1}$	0.220***	(4.96)	0.217***	(3.65)
$FUND\_SMTH_{t-4,t} \times XAC_t$	-0.216***	(-3.45)	0.001	(0.01)
$FUND\_SMTH_{t-4,t} \times XAC_{t+1}$	0.370***	(6.54)	0.439***	(5.84)
$FUND\_SMTH_{t-4,t} \times XCF_{t-1}$	0.437***	(7.01)	0.495***	(5.86)
$FUND\_SMTH_{t-4,t} \times XCF_t$	-0.568***	(-7.76)	-0.389***	(-3.80)
$FUND\_SMTH_{t-4,t} \times XCF_{t+1}$	-0.161***	(-2.59)	-0.003	(-0.03)
$FUND\_SMTH_{t-4,t} \times R_{t+1}$	0.016	(0.94)	0.016	(0.66)
$HighAb_t$			0.157***	(7.08)
$XAC_{t-1} \times HighAb_t$			-0.115**	(-2.29)
$XAC_t \times HighAb_t$			0.278***	(3.41)
$XAC_{t+1} \times HighAb_t$			0.118	(1.58)
$XCF_{t-1} \times HighAb_t$			0.126	(1.41)
$XCF_t \times HighAb_t$			0.165	(1.54)
$XCF_{t+1} \times HighAb_t$			0.050	(0.59)
$R_{t+1} \times HighAb_t$			-0.045**	(-2.04)
$DIS\_SMTH_{t-4,t} \times HighAb_t$			0.023	(0.86)
$DIS\_SMTH_{t-4,t} \times XAC_{t-1} \times HighAb_t$			-0.122	(-1.57)
$DIS\_SMTH_{t-4,t} \times XAC_t \times HighAb_t$			-0.010	(-0.09)

$DIS\_SMTH_{t-4,\,t}{\times}XAC_{t+1}{\times}HighAb_t$		0.253***	(2.66)
$DIS\_SMTH_{t-4,\,t}{\times}XCF_{t-1}{\times}HighAb_t$		-0.407***	(-3.59)
$DIS\_SMTH_{t-4,\,t}{\times}XCF_{t}{\times}HighAb_t$		0.037	(0.28)
$DIS\_SMTH_{t-4,\,t}{\times}XCF_{t+1}{\times}HighAb_t$		0.433***	(3.99)
$DIS\_SMTH_{t-4,\,t}{\times}R_{t+1}{\times}HighAb_t$		0.007	(0.24)
$FUND\_SMTH_{t-4,\,t}{\times}HighAb_t$		-0.063**	(-2.10)
$FUND\_SMTH_{t-4,\,t}{\times}XAC_{t-1}{\times}HighAb_t$		0.065	(0.78)
$FUND\_SMTH_{t-4,\,t}{\times}XAC_{t}{\times}HighAb_t$		-0.481***	(-4.09)
$FUND\_SMTH_{t-4,\,t}{\times}XAC_{t+1}{\times}HighAb_t$		-0.149	(-1.44)
$FUND\_SMTH_{t-4,\,t}{\times}XCF_{t-1}{\times}HighAb_t$		-0.085	(-0.73)
$FUND\_SMTH_{t-4,\,t}{\times}XCF_{t}{\times}HighAb_t$		-0.375***	(-2.67)
$FUND\_SMTH_{t-4,\,t}{\times}XCF_{t+1}{\times}HighAb_t$		-0.251**	(-2.18)
$FUND\_SMTH_{t-4,\,t}{\times}R_{t+1}{\times}HighAb_t$		0.015	(0.46)
Control variables and their interactions	Included	Included	
Firm and Year Fixed Effects	Included	Included	
R^2	48.55%	49.07%	
N	43,322	43,322	

Panel D. The coefficient on future cash flows (*CFO_{t+1}*) across high and low values of managerial ability and discretionary and fundamental smoothing

		Low ability		High ability		*Difference test*
Low discretionary smoothing	(A')	0.238*** (0.0004)	(B')	0.288*** (<0.0001)	(B') – (A')	0.050 (0.557)
High discretionary smoothing	(C')	-0.081 (0.181)	(D')	0.402*** (<0.0001)	(D') – (C')	0.483*** (<0.0001)
Difference test	(C') –(A')	-0.319*** (<.0001)	(D') –(B')	0.114 (0.136)		
Low fundamental smoothing	(A")	0.238*** (0.0004)	(B")	0.288*** (<.0001)	(B") – (A")	0.050 (0.557)
High fundamental smoothing	(C")	0.235*** (0.0004)	(D")	0.035 (0.576)	(D") – (C")	-0.020** (0.016)
	(C") –(A")	-0.003 (0.974)	(D") –(B")	-0.253*** (0.002)		

Panels A of C of this table report the regression results of the expanded FERC model with the interactions of smoothing (fundamental and discretionary smoothing) and managerial ability (*HighAb*). The dependent variable is the cumulative buy-and-hold return for fiscal year *t*. *HighAb* takes the value of one if MA-Score is above the median, and zero otherwise. *XCF* is measured as cash flows from operations for year *t*, deflated by the market value of equity at the beginning of fiscal year *t*. *XAC* is measured as total accruals (IB-OANCF) for year *t*, deflated by the market value of equity at the beginning of fiscal year *t*. We use the percentile rank that takes a value between zero and one for $SMTH_{t-4,\,t}$, $DIS\_SMTH_{t-4,\,t}$, and $FUND\_SMTH_{t-4,\,t}$. Firm size, earnings volatility, the number of analysts, institutional holdings, and their interactions are included in the model but the coefficients are not reported here for brevity. We include firm and year fixed effects in the model but do not report them in the table for brevity. The sample is comprised of 43,322 observations from Compustat for the years 1991 to 2011. Panels B and D present the estimated coefficient on future cash flows (CFO_{t+1}) across high and low values of managerial ability and smoothing. Specifically, for Panel B, we use the lowest and highest values of $HighAb_t$ (i.e., 0/1) and the lowest and highest values of $SMTH_{t-4,\,t}$ (i.e., 0/1) along with the estimated coefficients in column 3 of Panel A. For Panel D, we use the lowest and highest values of $HighAb_t$ (i.e., 0/1) and the lowest and highest values of $DIS\_SMTH_{t-4,\,t}$ and $FUND\_SMTH_{t-4,\,t}$ (i.e., 0/1) along with the estimated coefficients in column 2 of Panel C. All tests are two-tailed. *, **, and *** denote significance at the 0.1, 0.05 and 0.01 levels, respectively. See Appendix II for the definitions of the variables.

TABLE 6
Analyses using a Constant Management Sample

Panel A. Descriptive Statistics (N = 21,900)

Variable	Mean	Std. Dev.	Q1	Median	Q3
Firm efficiency	0.501	0.246	0.306	0.523	0.697
MA-Score	0.510	0.317	0.222	0.556	0.778
$SMTH_{t,t+4}$	-0.018	0.984	-0.521	0.271	0.726
$FUND\_SMTH_{t,t+4}$	-0.023	0.370	-0.272	0.012	0.254
$DIS\_SMTH_{t,t+4}$	0.004	0.922	-0.442	0.236	0.639
$SMTH_{t-4,t}$	-0.043	1.004	-0.556	0.259	0.717
$FUND\_SMTH_{t-4,t}$	-0.045	0.452	-0.362	0.035	0.294
$DIS\_SMTH_{t-4,t}$	0.003	0.905	-0.419	0.212	0.591
Firm size	5.229	1.996	3.737	5.024	6.450
Leverage	0.432	0.214	0.255	0.422	0.585
BM ratio	-0.484	1.005	-1.100	-0.498	0.078
Sales volatility	0.343	0.370	0.120	0.227	0.418
Loss%	0.327	0.346	0.000	0.200	0.600
Operating cycle	4.711	0.756	4.327	4.782	5.187
Sales growth	0.117	0.397	-0.045	0.070	0.204
Operating leverage	0.266	0.232	0.083	0.190	0.385
AvgCFO	0.049	0.176	0.014	0.075	0.134
E_t	-0.005	0.191	-0.041	0.032	0.086
CFO_t	0.060	0.166	0.005	0.076	0.142
CFO_{t+1}	0.071	0.201	0.004	0.079	0.155
CFO_{t-1}	0.048	0.159	0.003	0.071	0.130
XCF_{t-1}	0.132	0.386	0.003	0.071	0.164
XAC_{t-1}	-0.171	0.463	-0.161	-0.049	-0.005
XCF_t	0.152	0.399	0.005	0.077	0.180
XAC_t	-0.153	0.384	-0.166	-0.053	-0.008
XCF_{t+1}	0.166	0.431	0.005	0.084	0.193
XAC_{t+1}	-0.149	0.375	-0.169	-0.059	-0.010
R_t	0.184	0.838	-0.301	0.020	0.403
R_{t+1}	0.177	0.824	-0.290	0.020	0.390
Historical ROA	0.490	0.845	0.087	0.229	0.544
Historical returns	0.026	2.059	-0.886	-0.289	0.489

Table 6 (Cont'd)

Panel B. Impact of managerial ability on smoothing

	Dependent variable = $SMTH_{t,t+4}$	
	(1)	
	Coefficients	*t*-value
MA-Score	0.084***	(3.49)
Firm size	-0.039***	(-3.30)
Leverage	0.053	(1.20)
BM ratio	0.023***	(2.58)
Sales volatility	-0.099***	(-4.65)
Loss%	-0.152***	(-4.90)
Operating cycle	-0.151***	(-5.98)
Sales growth	-0.017	(-1.26)
Operating leverage	-0.050	(-0.70)
AvgCFO	0.106	(1.60)
Firm and Year Fixed Effects	Included	
R^2	63.09%	
N	27,700	

Panel C. Impact of smoothing by high ability managers on current earnings informativeness about future cash flows

	Dependent variable = CFO_{t+1}			
	(1)		(2)	
	Coefficients	*t*-value	Coefficients	*t*-value
E_t	0.374***	(24.04)	0.433***	(22.56)
CFO_{t-1}	0.133***	(6.65)	0.099***	(3.89)
$DIS\_SMTH_{t-4,\,t}$	0.008	(1.63)	-0.007	(-1.08)
$DIS\_SMTH_{t-4,\,t}\times E_t$	0.044*	(1.88)	-0.116***	(-3.83)
$DIS\_SMTH_{t-4,\,t}\times CFO_{t-1}$	-0.100***	(-3.62)	-0.004	(-0.10)
$FUND\_SMTH_{t-4,\,t}$	0.005	(0.58)	0.020**	(1.99)
$FUND\_SMTH_{t-4,\,t}\times E_t$	-0.225***	(-5.93)	-0.410***	(-7.95)
$FUND\_SMTH_{t-4,\,t}\times CFO_{t-1}$	-0.189***	(-5.11)	-0.272***	(-5.10)
$HighAb_t$			0.013*	(1.87)
$E_t\times HighAb_t$			-0.162***	(-4.82)
$CFO_{t-1}\times HighAb_t$			0.067*	(1.76)
$DIS\_SMTH_{t-4,\,t}\times HighAb_t$			0.016*	(1.88)
$DIS\_SMTH_{t-4,\,t}\times E_t\times HighAb_t$			0.410***	(8.31)
$DIS\_SMTH_{t-4,\,t}\times CFO_{t-1}\times HighAb_t$			-0.194***	(-3.57)
$FUND\_SMTH_{t-4,\,t}\times HighAb_t$			-0.033***	(-2.96)
$FUND\_SMTH_{t-4,\,t}\times E_t\times HighAb_t$			0.300***	(4.03)
$FUND\_SMTH_{t-4,\,t}\times CFO_{t-1}\times HighAb_t$			0.132*	(1.89)
Firm and Year Fixed Effects	Included		Included	
R^2	65.18%		65.47%	
N	21,900		21,900	

Table 6 (Cont'd)

Panel D. Impact of smoothing by high ability managers on stock price informativeness about future cash flows

	Dependent variable = R_t			
	(1)		(2)	
	Coefficients	*t*-value	Coefficients	*t*-value
XAC_{t-1}	-0.084*	(-1.79)	-0.051	(-0.94)
XAC_t	0.283***	(3.79)	0.116	(1.33)
XAC_{t+1}	-0.224***	(-3.39)	-0.217***	(-2.75)
XCF_{t-1}	-0.590***	(-8.81)	-0.611***	(-7.10)
XCF_t	0.770***	(8.67)	0.635***	(5.45)
XCF_{t+1}	0.177*	(2.48)	0.234**	(2.50)
R_{t+1}	-0.335***	(-13.73)	-0.327***	(-11.72)
$DIS\_SMTH_{t-4,\,t}$	0.106***	(4.27)	0.075**	(2.30)
$DIS\_SMTH_{t-4,\,t}{\times}XAC_{t-1}$	-0.314***	(-5.87)	-0.279***	(-4.02)
$DIS\_SMTH_{t-4,\,t}{\times}XAC_t$	0.185**	(2.51)	0.244**	(2.47)
$DIS\_SMTH_{t-4,\,t}{\times}XAC_{t+1}$	0.333***	(4.93)	0.118	(1.30)
$DIS\_SMTH_{t-4,\,t}{\times}XCF_{t-1}$	0.191**	(2.50)	0.335***	(3.19)
$DIS\_SMTH_{t-4,\,t}{\times}XCF_t$	-0.031	(-0.35)	0.009	(0.07)
$DIS\_SMTH_{t-4,\,t}{\times}XCF_{t+1}$	0.057	(0.75)	-0.238**	(-2.20)
$DIS\_SMTH_{t-4,\,t}{\times}R_{t+1}$	-0.008	(-0.44)	-0.001	(-0.03)
$FUND\_SMTH_{t-4,\,t}$	-0.049	(-1.19)	-0.038	(-0.77)
$FUND\_SMTH_{t-4,\,t}{\times}XAC_{t-1}$	0.192***	(3.16)	0.214***	(2.70)
$FUND\_SMTH_{t-4,\,t}{\times}XAC_t$	-0.251***	(-2.87)	0.012	(0.10)
$FUND\_SMTH_{t-4,\,t}{\times}XAC_{t+1}$	0.319***	(4.03)	0.379***	(3.64)
$FUND\_SMTH_{t-4,\,t}{\times}XCF_{t-1}$	0.484***	(5.72)	0.511***	(4.37)
$FUND\_SMTH_{t-4,\,t}{\times}XCF_t$	-0.604***	(-5.92)	-0.384***	(-2.65)
$FUND\_SMTH_{t-4,\,t}{\times}XCF_{t+1}$	-0.166*	(-1.95)	-0.094	(-0.77)
$FUND\_SMTH_{t-4,\,t}{\times}R_{t+1}$	0.028	(1.16)	0.048	(1.41)
$HighAb_t$			0.150***	(4.30)
$XAC_{t-1}{\times}HighAb_t$			-0.119*	(-1.74)
$XAC_t{\times}HighAb_t$			0.403***	(3.48)
$XAC_{t+1}{\times}HighAb_t$			0.018	(0.16)
$XCF_{t-1}{\times}HighAb_t$			0.030	(0.25)
$XCF_t{\times}HighAb_t$			0.303**	(2.02)
$XCF_{t+1}{\times}HighAb_t$			-0.152	(-1.26)
$R_{t+1}{\times}HighAb_t$			-0.016	(-0.55)
$DIS\_SMTH_{t-4,\,t}{\times}HighAb_t$			0.042	(0.98)
$DIS\_SMTH_{t-4,\,t}{\times}XAC_{t-1}{\times}HighAb_t$			-0.043	(-0.41)
$DIS\_SMTH_{t-4,\,t}{\times}XAC_t{\times}HighAb_t$			-0.210	(-1.40)
$DIS\_SMTH_{t-4,\,t}{\times}XAC_{t+1}{\times}HighAb_t$			0.407***	(3.03)
$DIS\_SMTH_{t-4,\,t}{\times}XCF_{t-1}{\times}HighAb_t$			-0.275*	(-1.81)
$DIS\_SMTH_{t-4,\,t}{\times}XCF_t{\times}HighAb_t$			-0.128	(-0.70)
$DIS\_SMTH_{t-4,\,t}{\times}XCF_{t+1}{\times}HighAb_t$			0.573***	(3.81)
$DIS\_SMTH_{t-4,\,t}{\times}R_{t+1}{\times}HighAb_t$			-0.003	(-0.07)
$FUND\_SMTH_{t-4,\,t}{\times}HighAb_t$			-0.051	(-1.05)
$FUND\_SMTH_{t-4,\,t}{\times}XAC_{t-1}{\times}HighAb_t$			0.009	(0.09)
$FUND\_SMTH_{t-4,\,t}{\times}XAC_t{\times}HighAb_t$			-0.577***	(-3.63)

$FUND\_SMTH_{t-4,\,t}{\times}XAC_{t+1}{\times}HighAb_t$			-0.120	(-0.84)
$FUND\_SMTH_{t-4,\,t}{\times}XCF_{t-1}{\times}HighAb_t$			-0.036	(-0.23)
$FUND\_SMTH_{t-4,\,t}{\times}XCF_{t}{\times}HighAb_t$			-0.458**	(-2.39)
$FUND\_SMTH_{t-4,\,t}{\times}XCF_{t+1}{\times}HighAb_t$			-0.071	(-0.45)
$FUND\_SMTH_{t-4,\,t}{\times}R_{t+1}{\times}HighAb_t$			-0.026	(-0.59)
Control variables and their interactions	Included		56.00%	
Firm and Year Fixed Effects	Included		Included	
R^2	55.58%		56.00%	
N	21,900		21,900	

This table reports the descriptive statistics (Panel A) and regression results (Panels B through D) using the sample holding managers constant across companies. Using information on CEO and CFO from ExecuComp and Audit Analytics, we compare CEO and CFO information between years *t*-1 and *t* to identify CEO/CFO turnover in year *t*. For the sample used in Panels A, C, and D, we exclude firms with CEO or CFO turnover for the years *t*-4 through *t*+1, over which the variables used in our regressions (e.g., $DIS\_SMTH_{t-4,t}$, CFO_{t+1}, and XCF_{t+1}) are measured, resulting in a sample size of 21,900 firm-year observations. In Panels C and D, we use the percentile rank that takes a value between zero and one for $DIS\_SMTH_{t-4,\,t}$ and $FUND\_SMTH_{t-4,\,t}$. The sample begins in 1997 because this is the earliest year for which CEO or CFO turnover for year *t*-4 is available in ExecuComp/Audit Analytics. For Panel B, we exclude firms with CEO or CFO turnover for years *t* through *t*+4, resulting in a sample of 27,700 firm-year observations. We include firm and year fixed effects in the model but do not report them in the table for brevity. All tests are two-tailed. *, **, and *** denote significance at the 0.1, 0.05 and 0.01 levels, respectively. See Appendix II for the definitions of the variables.

TABLE 7
Within-Firm Variation in Managerial Ability

Panel A. Changes in earnings informativeness based on within-firm variation in managerial ability

	Dependent variable = CFO_{t+1}							
	Sample that moved from a HIGH ability manager group to a LOW ability manager group				Sample that moved from a LOW ability manager group to a HIGH ability manager group			
	Ability >Median		Ability < Median		Ability < Median		Ability > Median	
	(1)		(2)		(3)		(4)	
	Coefficients	*t*-value	Coefficients	*t*-value	Coefficients	*t*-value	Coefficients	*t*-value
E_t	0.077	(1.26)	0.281***	(3.99)	0.469***	(7.85)	0.142**	(2.58)
CFO_{t-1}	-0.142	(-0.91)	-0.083	(-0.87)	-0.038	(-0.54)	-0.195	(-1.61)
$DIS\_SMTH_{t-4,\,t}$	-0.018	(-0.65)	-0.005	(-0.25)	0.001	(0.04)	-0.028	(-1.14)
$DIS\_SMTH_{t-4,\,t} \times E_t$	0.322**	(2.56)	-0.077	(-0.79)	-0.193**	(-2.01)	0.166*	(1.72)
$DIS\_SMTH_{t-4,\,t} \times CFO_{t-1}$	-0.140	(-0.79)	0.091	(0.75)	-0.148	(-1.44)	0.142	(1.07)
$FUND\_SMTH_{t-4,\,t}$	-0.117***	(-2.73)	-0.023	(-0.75)	-0.078*	(-1.90)	-0.058	(-1.56)
$FUND\_SMTH_{t-4,\,t} \times E_t$	0.111	(0.69)	-0.278**	(-2.08)	-0.094	(-0.69)	-0.048	(-0.33)
$FUND\_SMTH_{t-4,\,t} \times CFO_{t-1}$	0.140	(0.71)	0.123	(0.86)	0.206	(1.55)	0.243	(1.64)
Firm and Year Fixed Effects	Included		Included		Included		Included	
R^2	77.04%		80.94%		76.84%		75.83%	
N	1,693		1,693		1,904		1,904	

Table 7 (Cont'd)

Panel B. Changes in stock price informativeness based on within-firm variation in managerial ability

	Dependent variable = R_t							
	Sample that moved from a HIGH ability manager group to a LOW ability manager group				Sample that moved from a LOW ability manager group to a HIGH ability manager group			
	Ability > Median		Ability < Median		Ability < Median		Ability > Median	
	(1)		(2)		(3)		(4)	
	Coefficients	*t*-value	Coefficients	*t*-value	Coefficients	*t*-value	Coefficients	*t*-value
XAC_{t-1}	0.634	(0.91)	1.043***	(3.46)	-0.425	(-1.90)	-0.859**	(-2.52)
XAC_t	2.540***	(3.93)	-0.244	(-0.59)	1.797***	(4.67)	1.684***	(3.45)
XAC_{t+1}	-3.236***	(-5.77)	-0.390	(-0.85)	0.604	(1.62)	0.598	(1.27)
XCF_{t-1}	-0.905	(-1.20)	0.199	(0.49)	-2.074***	(-5.91)	-0.085	(-0.17)
XCF_t	4.388***	(6.38)	0.264	(0.53)	2.214***	(5.47)	0.658	(1.35)
XCF_{t+1}	-3.646***	(-6.41)	1.234***	(2.66)	1.976***	(5.23)	1.431***	(2.91)
R_{t+1}	-0.102	(-0.78)	-0.633***	(-4.55)	-0.659***	(-6.95)	-0.611***	(-4.87)
$DIS\_SMTH_{t-4,\,t}$	0.002	(1.46)	0.068	(0.51)	0.001	(0.83)	0.112	(0.97)
$DIS\_SMTH_{t-4,\,t} \times XAC_{t-1}$	0.001	(0.07)	-0.685**	(-2.54)	-0.002	(-0.87)	0.155	(0.40)
$DIS\_SMTH_{t-4,\,t} \times XAC_t$	0.011	(1.53)	0.457	(1.17)	0.003	(0.77)	-0.367	(-0.72)
$DIS\_SMTH_{t-4,\,t} \times XAC_{t+1}$	0.027***	(4.33)	-0.251	(-0.57)	-0.010**	(-2.12)	1.195***	(2.71)
$DIS\_SMTH_{t-4,\,t} \times XCF_{t-1}$	0.027***	(3.63)	0.081	(0.20)	0.012***	(2.97)	-0.742	(-1.28)
$DIS\_SMTH_{t-4,\,t} \times XCF_t$	-0.008	(-1.07)	0.550	(1.26)	-0.006	(-1.11)	-0.076	(-0.13)
$DIS\_SMTH_{t-4,\,t} \times XCF_{t+1}$	0.016**	(2.53)	-1.150***	(-2.61)	-0.017***	(-3.65)	1.735***	(3.61)
$DIS\_SMTH_{t-4,\,t} \times R_{t+1}$	-0.002	(-1.44)	0.097	(0.87)	0.000	(0.23)	0.065	(0.70)
$FUND\_SMTH_{t-4,\,t}$	0.000	(-0.06)	0.084	(0.39)	-0.003	(-1.32)	0.034	(0.18)
$FUND\_SMTH_{t-4,\,t} \times XAC_{t-1}$	0.000	(-0.02)	-0.632	(-1.59)	0.010**	(2.24)	0.731	(1.53)
$FUND\_SMTH_{t-4,\,t} \times XAC_t$	-0.015*	(-1.67)	0.038	(0.08)	-0.003	(-0.51)	0.452	(0.67)
$FUND\_SMTH_{t-4,\,t} \times XAC_{t+1}$	0.030***	(4.08)	0.351	(0.80)	0.009*	(1.68)	0.502	(0.95)
$FUND\_SMTH_{t-4,\,t} \times XCF_{t-1}$	-0.001	(-0.16)	-0.260	(-0.45)	0.020***	(3.65)	0.607	(0.85)
$FUND\_SMTH_{t-4,\,t} \times XCF_t$	-0.024***	(-2.61)	-0.322	(-0.60)	0.002	(0.28)	1.528**	(2.32)
$FUND\_SMTH_{t-4,\,t} \times XCF_{t+1}$	0.041***	(5.36)	-1.044**	(-2.13)	-0.009	(-1.57)	-1.669***	(-2.93)
$FUND\_SMTH_{t-4,\,t} \times R_{t+1}$	-0.005***	(-4.23)	-0.014	(-0.11)	0.003***	(3.18)	0.197	(1.51)
Control variables and their Interactions	Included		Included		Included		Included	
Firm and Year Fixed Effects	Included		Included		Included		Included	
R^2	85.48%		85.20%		82.33%		80.05%	
N	1,667		1,667		1,881		1,881	

This table reports the regression results based on within-firm variation in managerial ability. We report results for earnings informativeness (Panel A) and stock price informativeness (Panel B) for observations that moved from a high (low) managerial ability group to a low (high) managerial ability group. For each industry-year group, firms are sorted by the average value of MA-Score over years *t*-4 through *t*-2 ($MA\text{-}Score_{t-4,\ t-2}$) and by the average of MA-Score over years *t*+1 through *t*+3 ($MA\text{-}Score_{t+1,\ t+3}$). Firms in the top (bottom) half by $MA\text{-}Score_{t-4,\ t-2}$ and in the bottom (top) half by $MA\text{-}Score_{t+1,\ t+3}$ are classified as those moved from a high (low) to low (high) ability manager group. In columns (1), and (3), we estimate the models using the observations of year *t*-2 (i.e., pre-period); in columns (2) and (4), we estimate the models using the observations of year *t*+3 (i.e., post-period). All tests are two-tailed. *, ** and *** denote significance at the 0.1, 0.05 and 0.01 levels, respectively.