Managerial Ability and Income Smoothing*

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Abstract: In this study, we investigate whether managerial ability is related to income smoothing and, if so, whether smoothing associated with managerial ability improves the informativeness of earnings and stock prices about future performance. Using a large sample of firms, we find that managerial ability is positively related to smoothing. More importantly, we show that high ability managers incorporate more forward-looking information about cash flows into current earnings through smoothing, thereby enhancing earnings informativeness. We also find that smoothing associated with high ability managers improves stock price informativeness about future cash flows. Our study should be of interest to researchers, practitioners, and others concerned with understanding the determinants and usefulness of smoothing.

Keywords: Income Smoothing; Managerial Ability; Earnings Informativeness; Signaling.

*We thank Rajiv Banker, Jong-Hag Choi, Yiwei Dou (FARS Discussant), Igor Goncharov, Leslie Hodder, Paul Hribar, Lee-Seok Hwang, Sukyoon Jung, Jong Kwon Ko, Tom Linsmeier, Jerry Lobo, Linda Myers, Zoltan Novotny-Farkas, Jae-Yong Shin, Minsup Song, Anup Srivastava (AAA Discussant), Steve Young, Paul Zarowin, and seminar participants at Hanyang University, Indiana University-Indianapolis, Lancaster University, Seoul National University, The University of Texas at El Paso, the 2014 Korean Accounting Association Annual Meeting, the 2014 Accounting Conference at Temple University, the 2015 Financial Accounting and Reporting Section (FARS) Midyear Meeting, and the 2015 American Accounting Association annual meeting, for their helpful comments and suggestions. Bok Baik acknowledges financial support from the Institute of Management Research at Seoul National University.

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.

There are opposing views about the usefulness of smoothing. One the one hand, cross-country studies suggest that smoothing reflects opportunistic behavior of insiders (e.g., Leuz, Nanda, and Wysocki 2003; Bhattacharya, Daouk, and Welker 2003). Additionally, proponents of transparency, in which changes in the economic value of a firm are immediately reflected in

[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.

earnings, argue that smoothing impairs transparency because managers artificially smooth away a firm's fundamental volatility, thereby reducing the usefulness of earnings (Lang, Lins, and Maffett 2012; Barth, Konchitchki, and Landsman 2013).[3] On the other hand, a stream of research shows 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, 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 (e.g., financial misstatements, diminished reputation, job loss), we expect that low ability

[3] Please see Section II for a more thorough discussion of the smoothing versus transparency debate.

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.[4, 5]

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 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

[4] 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.

[5] 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 likely have less of an incentive to smooth if the costs of doing so outweigh the benefits.

accruals and changes in pre-managed earnings. 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 find 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 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.[6] 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 also show that smoothing by low ability

[6] 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).

managers reduces stock price informativeness. Additionally, we re-run the stock price informativeness test using a 30-day earnings announcement period and a 30-day non-earnings announcement period, similar to Muslu, Radhakrishnan, Subramanyam, and Lim (2015). We find evidence that the effect of managerial ability on stock price informativeness is concentrated around the earnings announcement period, supporting the view 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 by high ability managers as a credible signal to equity investors about firms' future performance.

We conduct a host of robustness tests, including using a constant management sample and within-firm variation in managerial ability, testing cross-sectional variation in firms' information asymmetry, using alternative signaling channels, and employing alternative models of earnings informativeness. Results of these additional tests are consistent with our main inference that smoothing by high ability managers reveals private information to equity investors.

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; Louis and Robinson 2005; Tucker and Zarowin 2006; Louis and White 2007; Badertscher, Collins, and Lys 2012). 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.

Overall, our study highlights that smoothing can be beneficial. This seemingly contrasts with the view held by some regulators and academics that firms should avoid smoothing because it misrepresents their true economic performance (Levitt 1998; Leuz et al. 2003). Further highlighting the importance of this issue is standard setters' shift towards a fair value model of reporting. Countering this view, Hann, Heflin, and Subramanyam (2007a) show that the smoothing provisions of Statement of Financial Accounting Standards No. 87 are more value relevant than a fair value model for pension accounting. Results from our study suggest that more capable managers who use discretionary accounting choices to signal future performance via smoothing provide more useful financial reporting, in line with the conceptual framework of financial reporting. Thus, an important take-away from our study is that under certain conditions, smoothing can be an important mechanism to enhance earnings quality and can supplement the inherent shortcomings of fair value reporting (Sankar and Subramanyam 2001).

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).[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. Finally, our study 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. Findings from our

[7] 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. We discuss Demerjian et al. (2017) in more detail in Section II.

study should be of interest to regulators, 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 discusses our main empirical results and additional tests. We summarize and conclude our study in section V.

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.

Benefits and Costs of Smoothing

Following Beidleman (1973), we define smoothing as the use of managerial discretion to dampen fluctuations in earnings streams. On the one hand, smoothing provides several benefits. Prior research suggests that managers use their private information about future events to determine earnings such that reported earnings are close to their firm's permanent earnings (Chaney and Lewis 1995; Chaney et al. 1998). Smoothing therefore allows managers to communicate a firm's true economic performance, thereby helping investors and analysts to predict future earnings (Subramanyam 1996; Tucker and Zarowin 2006). Smooth income also has the potential to lower investors' estimates of firm's underlying earnings volatility and thus results in a lower risk premium (Trueman and Titman 1988). Consistent with this argument, Barth, Elliott, and Finn (1999) find that firms reporting strings of year-over-year increases in earnings are priced at a premium and Francis, LaFond, Olsson, and Schipper (2004) show that income smoothing is associated with a lower cost of equity. Stakeholders, such as customers and suppliers, also reward smoother earnings with better terms of trade (Graham et al. 2005; Dou et al. 2013). Furthermore,

managers may benefit from smooth earnings because they can increase the value of managers' stock-based compensation and improve their job security (DeFond and Park 1997).

On the other hand, smoothing can be costly. Smoothing decisions may begin the slippery slope to financial misreporting (Schrand and Zechman 2012). For example, if a manager borrows from the future (i.e., shifts accruals from the future to the present) to improve current performance, and her optimistic performance expectations are not subsequently realized, then she is likely to be forced to engage in more aggressive accounting choices to cover the reversal of the previous period's optimistic adjustment and to maintain the trend set by previous earnings (Myers, Myers, and Skinner 2007). Thus, managers' initial accounting adjustments based on an inaccurate prediction of future prospects likely increase the frequency of financial misstatements and litigation.

In addition, managers' accounting choices to smooth earnings may increase the likelihood of restatements, enforcement actions, and litigation. For example, Badertscher et al. (2012) show that discretionary accounting choices that are not for opportunistic reasons can also result in restatements because managers' *ex ante* view of what is within the boundaries of GAAP may differ from regulators' view, *ex post*. As a result, managers are likely to experience negative reputation and career consequences such as dismissal (Desai, Hogan, and Wilkins 2006; Hazarika, Karpoff, and Nahata 2012). In addition, as effective smoothing requires managers to identify specific techniques to achieve the desired adjustments, managers may need to make costly adjustments to their accounting process, which may adversely affect firm value. In summary, when considering benefits and costs of income smoothing, we expect managers to weigh the "net" benefit of smoothing when making smoothing decisions.

Managerial Ability and Smoothing

There is a fairly well developed empirical literature on determinants of smoothing (e.g., Dascher and Malcom 1970; Barnea et al. 1976; 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 high quality expectations about future earnings necessarily requires superior ability to forecast changes in firms' economic prospects. That is, to effectively smooth earnings, managers must accurately forecast earnings, which 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. In a contemporaneous study, Demerjian et al. (2017) also assess the relation between smoothing and managerial ability. 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., insider 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, since low ability managers have inferior private information about their firms' economic prospects and accruals generation process compared to high ability managers, low ability managers are more likely than high ability managers to err when making smoothing decisions. As such, low ability managers who smooth are more likely than high ability managers to bear the costs associated with smoothing, as previously discussed. Specifically, if a manager with poor forecasting ability borrows too much from the future to improve current performance and future performance is not as good as expected, then smoothing may result in increased earnings volatility, as future earnings realizations will be worse than those without smoothing. Accounting adjustments based on poor forecasts may also lead to financial misstatements and legal actions, thereby resulting in diminished managerial reputation, potential job loss, and lower equity-based wealth for managers. In addition, low ability managers may need to resort to more costly adjustments to smooth income, which may adversely affect firm value.

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. In other words, high ability managers are more likely to have a net benefit from smoothing than are low 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, Liu, and Qiu 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.

It is possible that high ability managers are also in a better position than low ability managers to make one-time charges (e.g., asset write-offs) because taking charges also requires private information about the underlying performance of the firm. [8] To the extent that high ability managers are more likely to show "big bath reporting" to provide private information about firms' performance, we might observe a *negative* relation between managerial ability and smoothing. However, given the asymmetric nature of asset write-offs, we expect that communication achieved via write-offs is less likely to reveal private information. In other words, the communication through asset write-offs can occur only when there is substantial negative news exceeding a certain threshold due to accounting standards, which in turn deters timely communication with the market. For example, the threshold for a goodwill write-off is undiscounted cash flows instead of discounted cash flows. Consistent with our view, existing empirical evidence shows that asset write-offs reflect managers' opportunistic reporting behavior rather than the provision of their private information (Riedl 2004; Ramanna and Watts 2012).

[8] We thank the editor for suggesting this alternative view.

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 smoothing by high ability managers likely incorporates more forward-looking information into current earnings 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. To this point, Kirschenheiter and Melumad (2004) theorize that, in equilibrium, smoothing by better informed managers improves earnings quality, while smoothing by relatively uninformed managers provides no information benefits because they cannot distinguish between the permanent and transitory components of earnings. This suggests that 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.

The Debate about Smoothing versus Transparency

Our study is related to the debate about the appropriate model for financial reporting. Some regulators and academics hold the view that the most desirable property of earnings is transparency, in which changes in the economic value of a firm are immediately reflected in earnings through fair value accounting (Barth et al. 2013). Proponents of a fair value model view smoothing as an impediment to transparent and relevant financial reporting because it artificially smooths volatility that reflects a firm's fundamentals (Lang et al. 2002; Leuz et al. 2003; Scott 2012).

While we acknowledge that a fair value model can improve the usefulness of earnings under certain circumstances (e.g., for individual financial assets and liabilities that are traded in active markets), we argue that smoothing can be beneficial and co-exist with transparency. Smoothing can provide a remedy for several drawbacks of fair value accounting because managers can reveal private information about future cash flows by smoothing reported earnings such that they are closer to the firm's permanent earnings (Chaney and Lewis 1995; Chaney et al. 1998).

Furthermore, to the extent that smoothing can be used to reflect changes in the economic value of a firm, smoothing can potentially improve, rather than impair, the relevance of earnings. While research on smoothing versus fair value is scarce, Hann et al. (2007a) provide evidence that a fair value model *impairs* relevance because more transitory components of earnings are not isolated from more persistent components of earnings, while a smoothing model enhances relevance. Their results suggest that smoothing can improve relevance in settings where the limitations of a fair value model are amplified.[9] Additionally, Hann, Lu, and Subramanyam (2007b) and Badertscher et al. (2012) suggest that managers' discretion in financial reporting can enhance relevance.[10]

Note that the positive role of smoothing is not generalizable to all types of smoothing, but rather is applicable to smoothing under certain conditions.[11] We contribute to the debate about the appropriate financial reporting model by providing evidence about whether smoothing by high ability managers versus low ability managers improves earnings usefulness.

[9] Other studies that support a role of smoothing in enhancing relevance include Subramanyam (1996), Liu, Ryan, and Wahlen (1997), Barth et al. (1999), Francis et al. (2004), Tucker and Zarowin (2006), and Das, Shroff, and Zhang (2009).

[10] In addition, Hunt, Moyer, and Shevlin (2000) document that smoothing is associated with a stronger price-earnings relation. Ewert and Wagenhofer (2005) develop a theoretical model in which tighter accounting standards reduce noise in reported earnings, thus decreasing the variability of reported earnings and increasing their value relevance (i.e., the earnings-return relation).

[11] For example, Cahan, Liu, and Sun (2008) and Amiram and Owens (2018) find evidence that smoothing is beneficial only in countries with strong investor protection. The analytical model in Sankar and Subramanyam (2001) also underscores the importance of formal mechanisms that restrict managers' reporting discretion in determining the usefulness of income smoothing.

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.[12] 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).[13] 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, which are on the frontier, and values of less than one to inefficient DMUs. Thus, the DEA technique assigns efficiency scores for inefficient units based on the distance of the DMU from the frontier (see Online Appendix A 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

[12] 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 ($SMTH_{t, t+4}$).
[13] We re-estimate our models without this filter, leaving inferences unchanged.

other measures are usually firm-specific (e.g., past abnormal performance). Demerjian et al. (2012) 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.[14]

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:

[14] 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.

$$Firm\ Efficiency_t = \alpha_0 + \alpha_1 Firm\ size_t + \alpha_2 Market\ share_t + \alpha_3 Positive\ free\ cash\ flow_t + \alpha_4 Age_t + \alpha_5 Business\ segment\ concentration_t + \alpha_6 Foreign\ currency\ indicator_t + \sum_t Year_t + \varepsilon_t \quad \textbf{(1)}$$

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 I. The residual from Equation (1) is our main measure of managerial ability, which Demerjian et al. (2012) attribute to the management team.[15] 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

[15] 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.

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):

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

$SMTH_{t,t+4}$ 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, Huang, Rajgopal, and Zang 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.

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 definitions of the control variables in Appendix I. 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:

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

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 properties of future earnings.[16] 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*.[17] $SMTH_{t-4,\,t}$ is the aggregated measure of income smoothing measured from years *t*-4 to *t*. For ease

[16] We are grateful to the editor for insightful comments on this issue.
[17] 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).

of interpretation, we use the percentile rank of $SMTH_{t-4,\,t}$, which takes a value between zero and one.[18] $HighAb_t$ equals one if $MA\text{-}Score_t$ is above its median value, and zero otherwise.

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 ($SMTH_{t-4,t}\times E_t$).[19] 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 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:

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

[18] Our inferences are not affected when we use the continuous value of $SMTH_{t-4,\,t}$ in Equations (3) and (4) (untabulated).
[19] We predict a positive coefficient on $SMTH_{t-4,t}\times E_t$ 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 $SMTH_{t-4,t}\times E_t$ 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.

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.[20] 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.[21]

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 the future earnings response coefficient (FERC). This measure is widely used as a proxy for stock price informativeness.[22] 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

[20] 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).

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

[22] 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).

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).

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 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., $SMTH_{t,t+4}$, $SMTH_{t-4,t}$) 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.[23]

[Insert Table 3 here]

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

[23] 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.

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.[24] 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

[24] It is possible that our results are driven by clustered observations in the low ability/low smoothing group and high ability/high smoothing group. In untabulated results, we find that the number of observations for the low ability/low smoothing (low ability/high smoothing) group is 11,510 (9,973), and 10,146 (11,693) for the high ability/low smoothing (high ability/high smoothing) group. Clustering does not therefore appear to be an issue for our results.

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). Taken together, the results suggest that smoothing is an important channel through which high ability managers communicate their private information about future cash flows.

To address the possibility 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),[25] we follow Lang et al. (2012) and decompose smoothing into its fundamental and discretionary components. When we replace smoothing with its discretionary and fundamental components, we find that while both aspects of smoothing enhance the ability of current earnings to predict future cash flows, discretionary smoothing provides more information. Please see Online Appendix B for more details about the estimation of the discretionary and fundamental smoothing components, and related empirical results. Overall, results in Table 4 support our second hypothesis that smoothing by high ability managers improves earnings informativeness more than smoothing by low ability managers.

[Insert Table 4 here]

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

[25] 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.

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).[26] In column 2, we report a negative and significant coefficient on the interaction between our smoothing measure and future cash flows ($SMTH_{t-4,\ t}\times XCF_{t+1}$), while the coefficient on the interaction between our smoothing measure and future accruals ($SMTH_{t-4,\ t}\times XAC_{t+1}$) is positive and significant.[27]

[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 $SMTH_{t-4,t}\times XCF_{t+1}\times HighAb_t$, implying that stock prices better anticipate future cash flows when high ability managers report smoother earnings. In contrast, the coefficient on $SMTH_{t-4,t}\times XCF_{t+1}$ 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 $SMTH_{t-4,\ t}$ (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

[26] 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 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.

[27] 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).

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.

Similar to our earnings informativeness tests, we also replace total smoothing with fundamental smoothing and discretionary smoothing to examine their impact on stock price informativeness. We find that that discretionary smoothing is more useful to equity investors and that fundamental smoothing is less useful. Please see Online Appendix B for details.

To provide corroborating evidence about the impact of smoothing by high ability managers on stock price informativeness, we follow Muslu et al. (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)).[28] 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. We report the results in Panel C of Table 5. 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, as reported in column 1. In contrast, when we measure stock returns over the 30-day period *before* the earnings announcement date, the three-way interaction in column 2 is insignificant. Results from the short-window tests reinforce the notion that smoothing by high ability managers helps investors better predict future performance. Overall, results in Table 5 suggest that high ability

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

managers use smoothing to communicate their assessment of future performance and that investors value this information. [29, 30]

Additional Tests

We perform several additional tests that leave our main inferences unchanged. We briefly describe the tests here and refer the reader to Online Appendix C for details.

- We re-estimate our models using a constant management team to ensure that our results are due to the management team, rather than to firm-specific characteristics.

- We 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 endogeneity, we cannot completely rule out endogeneity.

- We investigate whether cross-sectional differences in firms' information asymmetry influence high ability managers' use of smoothing to signal their private information.[31] 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 are stronger for firms with higher levels of information asymmetry.

- We assess the sensitivity of our results based on whether firms employ other signaling channels. We find that smoothing by high ability managers is more pronounced for firms with fewer other signaling channels.

- Finally, 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.

[29] 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.

[30] 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.

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

V. 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 income smoothing 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. Endogeneity 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 several 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
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.

$SMTH_{t,t+4\ (t-4,\ t)}$	The common factor identified by factor analysis on the three measures of income smoothing: $SMTH1_{t,t+4\ (t-4,\ t)}$, $SMTH2_{t,t+4\ (t-4,\ t)}$, and $SMTH3_{t,t+4\ (t-4,\ t)}$.
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 $(Sales_t\text{-}Sales_{t-1})/Sales_{t-1}$.
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.

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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
$SMTH_{t-4,t}$	0.000	1.000	-0.474	0.319	0.742
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***
$SMTH_{t-4,t}$	0.078	-0.080	0.158***
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 I for the definitions of the variables.

TABLE 2
Correlations between Smoothing and Managerial Ability

	$SMTH_{t,t+4}$	$SMTH_{t-4,t}$	*Historical ROA*	*Historical returns*
MA-Score	0.10***	0.10***	0.24***	0.21***
	(<0.01)	(<0.01)	(<0.01)	(<0.01)
$SMTH_{t,t+4}$		0.33***	0.18***	0.12***
		(<0.01)	(<0.01)	(<0.01)
$SMTH_{t-4,t}$			0.23***	0.16***
			(<0.01)	(<0.01)
Historical ROA				0.47***
				(<0.01)

This table presents the Pearson correlation coefficients between *MA-Score*, 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 I 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 0.05 and 0.01 levels, respectively. See Appendix I 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. Analyses 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 A of this table reports the regression results of future cash flows on current earnings with the interactions of 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 $SMTH_{t-4,\,t}$. 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. Panel B presents 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, 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. All tests are two-tailed. *, **, and *** denote significance at the 0.1, 0.05 and 0.01 levels, respectively. See Appendix I 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. Analyses 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. Stock price informativeness tests using short-window returns

	Dependent variable = *R(-10,+20)*		Dependent variable = *R(-40, -11)*	
	(1)		(2)	
	Coefficients	*t*-value	Coefficients	*t*-value
XAC_{t-1}	-0.030***	(-2.89)	-0.011	(-1.18)
XAC_t	-0.004	(-0.27)	0.015	(1.02)
XAC_{t+1}	0.044***	(2.88)	-0.012	(-0.88)
XCF_{t-1}	-0.045***	(-2.85)	-0.027*	(-1.82)
XCF_t	0.039*	(1.92)	0.037**	(2.00)
XCF_{t+1}	0.026	(1.53)	-0.009	(-0.59)
R_{t+1}	0.100***	(17.36)	0.052***	(9.76)
$SMTH_{t-4,\,t}$	-0.003	(-0.39)	0.000	(0.06)
$SMTH_{t-4,\,t}\times XAC_{t-1}$	0.003	(0.15)	-0.037*	(-1.93)
$SMTH_{t-4,\,t}\times XAC_t$	0.041	(1.45)	0.024	(0.91)
$SMTH_{t-4,\,t}\times XAC_{t+1}$	-0.050**	(-2.01)	-0.006	(-0.25)
$SMTH_{t-4,\,t}\times XCF_{t-1}$	0.043	(1.51)	-0.032	(-1.23)
$SMTH_{t-4,\,t}\times XCF_t$	0.007	(0.19)	0.009	(0.29)
$SMTH_{t-4,\,t}\times XCF_{t+1}$	-0.060**	(-2.08)	-0.016	(-0.60)
$SMTH_{t-4,\,t}\times R_{t+1}$	0.009	(1.15)	-0.015**	(-2.12)
$HighAb_t$	0.003	(0.59)	0.004	(0.80)
$XAC_{t-1}\times HighAb_t$	-0.014	(-1.08)	0.021*	(1.87)
$XAC_t\times HighAb_t$	0.013	(0.64)	0.018	(1.02)
$XAC_{t+1}\times HighAb_t$	-0.039**	(-2.08)	0.003	(0.16)
$XCF_{t-1}\times HighAb_t$	-0.040*	(-1.79)	0.027	(1.32)
$XCF_t\times HighAb_t$	-0.023	(-0.89)	0.003	(0.11)
$XCF_{t+1}\times HighAb_t$	-0.007	(-0.34)	-0.008	(-0.40)
$R_{t+1}\times HighAb_t$	0.002	(0.37)	0.001	(0.18)
$SMTH_{t-4,\,t}\times HighAb_t$	-0.009	(-1.01)	-0.004	(-0.42)
$SMTH_{t-4,\,t}\times XAC_{t-1}\times HighAb_t$	0.054*	(1.79)	0.027	(0.99)
$SMTH_{t-4,\,t}\times XAC_t\times HighAb_t$	-0.058	(-1.44)	-0.093**	(-2.49)
$SMTH_{t-4,\,t}\times XAC_{t+1}\times HighAb_t$	0.093***	(2.64)	0.023	(0.71)
$SMTH_{t-4,\,t}\times XCF_{t-1}\times HighAb_t$	0.067	(1.64)	0.025	(0.66)
$SMTH_{t-4,\,t}\times XCF_t\times HighAb_t$	-0.027	(-0.58)	-0.065	(-1.49)
$SMTH_{t-4,\,t}\times XCF_{t+1}\times HighAb_t$	0.069*	(1.78)	0.034	(0.95)
$SMTH_{t-4,\,t}\times R_{t+1}\times HighAb_t$	-0.008	(-0.76)	0.005	(0.52)
Control variables and their interactions	Included		Included	
Firm and Year Fixed Effects	Included		Included	

R^2	28.27%	25.77%
N	41,907	41,935

Panel A of this table reports the regression results of the expanded FERC model with the interactions of 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 $SMTH_{t-4,\,t}$. 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. Panel B presents the estimated coefficient on future cash flows (CFO_{t+1}) across high and low values of managerial ability and smoothing. Specifically, 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. Panel C reports the regression results of the expanded FERC model with the interactions of smoothing and managerial ability (*HighAb*) using short-window returns around (before) earnings announcement dates. The dependent variable for column 1 is the earnings announcement return measured over the 30-day period that starts 10 days before and ends 20 days after the earnings announcement date (*R(-10, +20)*). The dependent variable for column 2 is the pre-earnings announcement return measured over the 30-day period that starts 40 days before and ends 11 days before the earnings announcement date (*R(-40, -11)*). 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 are 41,907 and 41,935 firm-year observations from Compustat for the years 1991 to 2011 for column 1 and column 2, respectively. All tests are two-tailed. *, **, and *** denote significance at the 0.1, 0.05 and 0.01 levels, respectively. See Appendix 1 for the definitions of the variables.