Internalities of Disclosure Choice: Evidence from SG&A Cost Management Decisions

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ABSTRACT

This study examines the relation between complexity of annual reports and SG&A cost adjustments. Using a pooled analysis supplemented with a quasi-natural shock to disclosure complexity, we document that the stickiness of the SG&A costs is lower in the period after firms issue a complex annual report. We further document that the cost of borrowing mediates this relationship, suggesting that the reduction in SG&A cost stickiness is to offset the constraining effect of an increase in the cost of borrowing stemming from the complexity of annual reports. We next document that the intent of SG&A cost stickiness reduction is to fund investments, as the propensity to under-invest reduces in the post period. We substantiate the main finding and this interpretation further by showing that the increase in the stickiness of SG&A costs is higher for firms that are financially constrained, and firms with poor ex-ante information environment. Lastly, we find that managers reduce the SG&A resources that do not contribute to future value of the firm and the reduction in unused resources is stronger in under-invested firms. Our findings are robust to alternate measures of disclosure complexity and instrumental variable approach in addition to the quasi-natural experimental setting. We contribute to the literature on both disclosure complexity and cost management by providing evidence of the impact of disclosure complexity on managerial decision-making.

Keywords: Disclosure complexity; Cost Management; SFAS 133

I. INTRODUCTION

The relationship between external reporting choices and decision making has been of interest to researchers and practitioners alike. The purpose of this study is to examine one such relationship between a common reporting choice, i.e., disclosure complexity and an important cost decision made by managers, namely, SG&A cost management decision. Literature in accounting has long identified disclosure complexity as a key determinant of managerial decision making (Goodman et al. 2013; Chen et al. 2011; Can Chen et al. 2019; Biddle et al. 2009). However, these studies focus primarily on the effect of complexity on long-term decisions such as capital investment and/or R&D decisions. A value additive decision not widely studied in the context of complexity is SG&A cost management decision. In this paper, we attempt to fill this gap in the literature. Costs such as labor and material costs classified as SG&A costs, are paramount in creating current and future value for shareholders (Banker et al. 2011). Moreover, these costs form a significant proportion of a firm's total operating costs[1] (Chen et al. 2012). Thus, managing SG&A costs is of prime importance to firms and their agents. In this paper, we examine the relationship between disclosure complexity and managers' SG&A cost adjustment decisions.

The relationship between complexity of disclosures and SG&A cost adjustment decisions is not straightforward ex-ante. Following prior literature that documents a negative association between disclosure complexity and investment efficiency (Biddle et al. 2009) along with agency theory of the firm, it is reasonable to expect high disclosure complexity to reduce the efficiency of SG&A cost management decisions as well. This is based on the argument that complex annual reports increase agency conflicts between managers and shareholders by reducing information flow (Stiglitz and Weiss 1981) and diminishing the ability of shareholders to monitor managerial activities thereby impairing external discipline (Kanodia and Lee 1998; Jensen and Meckling 1976). Thus, complex annual reports provide managers with increased opportunities to invest in SG&A costs – in line with agency driven empire building. A wealth of literature in accounting has documented strong evidence of managers remaining invested in SG&A costs for private benefits such as empire building even during periods of sales decline (Anderson et al. 2003; Chen et al. 2012). Therefore, agency theory predicts that complex reports could lead to a disproportionate build-up of SG&A costs with respect to change in sales (*agency cost*

[1] SG&A spending is roughly nine times the size of R&D spending on an average for a firm (Banker et al. 2011)

channel hereafter).

However, when managers issue complex disclosures, the firm's cost of borrowing increases (Ertugrul et al. 2017), thereby increasing managers' tendency to build up internal funds. This is in line with the precautionary motive of cash holding which suggests that firms with poor access to capital markets hold higher levels of cash to safeguard against possible adverse shocks in the future (Bates et al. 2009; Opler et al. 1999). Therefore, when the cost of debt increases due to complex disclosure, managers could generate internal funds by reducing SG&A costs. Thus, complex reports could lead to a disproportionate reduction in SG&A costs with respect to change in sales (*internal funds channel* hereafter). Since the theoretical predictions for the association between complexity and SG&A cost adjustment are in opposite directions, we examine this relationship empirically in this study.

The analysis of the relationship between disclosure complexity and SG&A decisions is susceptible to endogeneity concerns, stemming from the fact that the issuance of complex disclosure as well as SG&A adjustment are choice decisions by the manager. Consequently, there may very well be no direct relation between complexity and SG&A decisions, and the correlations might be a manifestation of managerial choices. To mitigate this concern of endogeneity, we supplement our analysis with a quasi-natural experimental setting. In line with prior literature (Guay et al. 2016), we employ the adoption of SFAS 133 as an exogenous shock to disclosure complexity. SFAS 133 requires the disclosure of derivative transactions in a firm, and thereby increases disclosure complexity as identified in prior literature. We validate the impact of SFAS 133 to exogenously increase disclosure complexity in our setting before proceeding with the analysis of the impact of increase in disclosure complexity (exogenously) on SG&A adjustment decisions. We conduct the main analysis and all additional tests in both pooled and quasi natural setting to alleviate any concerns of endogeneity[2].

We capture complexity as the linguistic complexity and readability of annual reports (10-K filings). Following prior literature, we use the Bog Index[3] of 10-K filings as a measure of readability (Bonsall et al. 2017). To capture a *disproportionate* change in SG&A costs with respect to change in sales, we operationalize SG&A cost adjustment using the concept of cost

[2] We further conduct all our tests using an instrumental variable (IV) setting in unreported results. The results using IV are qualitatively similar to the main and quasi natural setting results.

[3] In robustness tests discussed later, we replace Bog Index by other popular measures of readability such as the Gunning Fog Index, file size of 10-K filings etc.

stickiness. Anderson et al. (2003) define costs as sticky when the decrease in costs following a sales decrease is lower than increase in costs following an equivalent sales increase. Thus, cost stickiness captures the extent to which managers remain invested in SG&A resources during sales decline periods as compared to periods of sales increase. Based on this definition of cost stickiness and the abovementioned theories, complexity of annual reports could lead to an increase in cost stickiness (agency cost channel) or a reduction in cost stickiness (internal funds channel). It is important to note here that we use cost stickiness as a mere proxy for SG&A cost adjustment decisions.

We examine the relation between annual report readability and cost stickiness using both, cross-sectional (industry fixed effects) and within-firm (firm fixed effects) designs. Within-firm design allows us to absorb the effect of unobserved omitted firm characteristics that may be correlated with both complexity and cost stickiness, while cross-sectional models account for industry level common omitted variables. In the cross-sectional specification, we find that higher 10-K Bog Index results in lower cost stickiness. Specifically, using a cross-sectional design, we document that as Bog Index moves from its below median value to above median value for the current period disclosure, SG&A cost stickiness reduces by approximately 13.8% in the following period. Further, using the within firms design, as a firm moves from below median values of Bog Index to above median values, SG&A cost stickiness reduces by approximately 23.6% in the following period. As discussed earlier, we resolve the endogeneity concerns using SFAS 133 as an exogenous shock to complexity. Using a difference-in-difference methodology, we document that treatment firms saw their managers reduce cost stickiness to a higher extent post SFAS 133, as compared to a set of control firms. Taken together, these findings are consistent with the internal funds channel explanation and suggest that complex disclosures force managers to reduce SG&A costs with respect to changes in sales, resulting in lower cost stickiness.

As a second research question, we study the types of SG&A costs that are being adjusted following complex financial statements. We categorize SG&A costs based on their ability to create value in future. This categorization is based on the method proposed by Banker et al. (2011) wherein they document that the value creation potential of SG&A cost varies based on the industry in which a firm operates. Results from both on average and in the quasi-natural setting indicate that the reduction in SG&A cost stickiness upon issuance of complex

disclosures is prevalent in firms that belong to industries where SG&A costs have low future value creation potential while there is no change in cost stickiness in firms that belong to industries with high value creation potential SG&A.

We next conduct a mediation/path analysis to understand the mechanism through which the relationship between reporting choices and SG&A cost management decisions manifests itself, cross-sectional tests for differences in types of firms observing such a relationship and conclude by examining the ultimate effect of such a characterization on future investment decisions. We begin by examining the underlying driver of the relationship between complexity and cost stickiness - if firms reduce their cost stickiness to generate internal funds because of increased cost of debt resulting from more complex disclosures, then cost of debt should mediate the relation between disclosure complexity and cost stickiness. Results from the Sobel-Goodman mediation test indicate that the cost of debt, measured as the average loan spread on private loans, has a significant mediating influence (about 59%) on the relation between complexity and cost stickiness. Interestingly, the direct effect of complexity on cost stickiness is statistically insignificant, suggesting that the only channel through which complexity affects cost stickiness is via cost of debt. Since the quasi-natural setting is essentially an event study, such mediation tests are not required.

Next, we examine cross-sectional variation in the relation between complexity and cost stickiness and its ultimate impact on investment decisions. If the need for internal funds is what drives firms to reduce stickiness, a negative relationship between complexity and stickiness (as in our main analysis) must only be observed in firms that are more dependent on such internal funds. To do so we split our sample into subsamples of underinvesting and overinvesting firms[4], based on the argument that under invested firms require funds for investments, while over invested firms can instead reduce their investments or remain status quo. The results suggest that the negative relationship between complexity and stickiness is pronounced in the subsample of underinvesting firms, i.e., those firms that are in need of internal funds. Similar results arise from the quasi-natural setting.

We further find that, on average, there is a reduction in the likelihood of a firm being an

[4] We label firms as underinvesting and overinvesting firms based on Biddle et al. 2009

under-investor following reduction in stickiness when complexity is high. This implies that the generation of internal funds by reducing cost stickiness helps alleviate investment inefficiency of the firm.

In other cross-sectional tests, we analyze how the negative relation between complexity and stickiness varies with: (1) the vulnerability of a firm to an increase in cost of borrowing, and (2) analyst forecast error (AFE). Under the internal funds channel, when disclosures are complex, firms that are financially constrained are likely to be impacted to a greater degree by an increase in cost of borrowing, thus increasing their reliance on internally generated funds to a greater extent. Accordingly, we find that the negative relation between disclosure complexity and cost stickiness is pronounced for financially constrained firms, while firms that are not financially constrained exhibit no effect of complex disclosure on cost management decision. Similarly, demand for information generated by analysts is higher when 10-K filings are less readable (Lehavy et al. 2011), suggesting that analysts play a key role in mitigating the complexity of 10-K filings. When such information is opaque and inaccurate, i.e., AFE is higher, it aggravates information asymmetry between firms and its shareholders resulting in higher cost of capital. Thus, firms that have higher AFE are likely to be impacted to a higher degree by an increase in cost of debt resulting from complex financial statements. We find that the negative relation between complexity and cost stickiness is pronounced for firms with higher AFE while other firms' cost management decisions remain unchanged post issuance of complex disclosure. Results of such cross-sectional tests remain qualitatively similar under the quasi-natural experimental setting.

We contribute in several ways to the literature in accounting pertaining to corporate disclosures and cost management. First, we document a relationship between external reporting choices and internal decision making by providing evidence on the consequence of complex disclosures on firms' cost adjustment decisions. SG&A costs are enablers of wealth creation for a firm and therefore it is important to document how a manager's choice to issue complex disclosures influences their ability to create wealth for the firm by impacting their cost-based decisions. Second, we document an important implication of the relationship between disclosure complexity and cost stickiness is on the wealth creation ability of a firm. While prior literature suggests that complex disclosures deteriorate investment decisions, our findings

suggest that the choice of managers to issue complex disclosures forces them to cut down unnecessary SG&A costs, thus improving the cost management decisions. This is an important finding as it shows that the managerial choice to obfuscate information by issuing complex disclosures comes at a cost since they are forced to reduce SG&A investments that could have otherwise helped them in empire building. Future research could explore this line of thinking further by examining the moderating role of governance in the relationships documented in this study. Third, we document the channel that drives the relation between disclosure complexity and SG&A cost adjustment decisions. Our finding that cost of debt completely mediates the effect of complexity on cost management decision enables us to isolate the channel through which the relationship is manifested (namely, the internal funds channel) and opens interesting avenues for future research. Finally, we contribute to the cost management literature by exploring a key determinant of cost decisions. SG&A costs are a significant fraction of costs involved in business operations[5] (Chen et al. 2012). Not surprisingly, managing SG&A costs is an important decision that not only impacts current earnings, but also future firm value. Therefore, evidence on the relation between disclosure complexity and cost stickiness carries implications for managers in improving their cost decision making.

The rest of the paper is organized as follows. Section II develops the hypotheses by reviewing the relevant literature. Section III outlines the research design and variable measurement. Section IV discusses the results of the empirical analysis. Section V concludes.

II. BACKGROUND AND HYPOTHESES DEVELOPMENT

Disclosure Complexity, Information Asymmetry and Cost of Debt

Users of financial statements such as regulators, practitioners, and standard setters have expressed concerns over the external reporting choices of firms, particularly, increasing difficulty of comprehending disclosures. Prior literature has found that these concerns are not unwarranted. For example, Li (2008) shows that the quantity of information disclosed in annual reports has been increasing over time. Loughran and Mcdonald (2011) demonstrate an increase in complexity of annual reports in terms of document length, which has increased to almost

[5] In our sample, SG&A costs to total assets ratio is approximately 30 percent, which is more than seven times the ratio of R&D expenses to total assets. These ratios are consistent with prior literature (for e,g, (Banker et al. 2011)).

60,000 words over the last 15 years. Dyer et al. (2017) show that over the period of 1996-2013, the length, amount of boilerplate text, and redundancy in annual reports have increased, while specificity and the amount of verifiable information have reduced. Likewise, practitioner reports such as the one by KPMG (2011) documented that the quantity of disclosures have increased to such an extent that relevant information is hidden in between huge chunks of irrelevant information.

A consequence of external reporting choices such as increased complexity is an increase in information asymmetry between the firm and its stakeholders. Several studies document evidence of such increased information asymmetry. Cazier and Pfeiffer (2015) show that price discovery is slower for firms that produce long annual reports with excessive boilerplate. Brown and Tucker (2011) find that when the Management Discussion and Analysis (MD&A) section borrows text from the previous year and contains relatively less new information, it evokes a low response from the market at the time of filing. Dyer et al. (2017) find that boilerplate text in annual reports is positively associated with measures of information asymmetry such as liquidity, analyst following, and institutional ownership.

The increase in information asymmetry resulting from external reporting choices of complexity increases cost of capital for firms. For instance, Lambert et al. (2007) document negative impact of poor disclosure quality on cost of capital via increased information asymmetry. Similarly, Biddle et al. (2009) find that firms with complex disclosures have poor investment efficiency resulting from an increase in external financing costs. Ertugrul et al. (2017) examine the influence of complex disclosures on cost of debt and find that more complex disclosures are associated with higher costs of debt as a result of higher information asymmetry. In sum, prior literature finds strong evidence of an increase in cost of external financing because of higher information asymmetry resulting from complexity of disclosures, especially 10-K filings.

SG&A Cost Adjustments, Excess resources and Cost Stickiness

Costs such as labor and material costs classified as SG&A costs, are paramount in creating current and future value for shareholders (Banker et al. 2011). Moreover, these costs form a significant proportion of a firm's total operating costs[6] (Chen et al. 2012). Thus,

[6] SG&A spending is roughly nine times the size of R&D spending on an average for a firm (Banker et al. 2011)

managing SG&A costs is of prime importance to firms and their agents. Research documents that such costs react asymmetrically to changes in sales and that this is a consequence of managers maintaining a certain amount of excess resources/ costs (Anderson et al. 2003). As the term suggests, excess resources are defined as resources in excess of what an organization needs to sustain its operations (Cyert & March, 1963; Vanacker, Collewaert, & Zahra 2017). Under the behavioral theory of firm, such resources act as an enabler of innovation and strategic behavior that creates wealth, and acts as a buffer to stabilize a firm's activities in face of external shocks (Cyert & March 1963). Management of excess resources often leads to an asymmetry in cost behavior of SG&A costs. Traditional models of cost behavior propose a linear relationship between cost drivers such as sales volume and associated SG&A costs (Horngren et al. 2012). Research in accounting and management has largely found otherwise. Several studies have found that costs behave asymmetrically, i.e., an increase in costs with sales increase is higher than decrease in cost with sales decrease (Anderson et al. 2003) (ABJ hereafter). This phenomenon is labeled as cost stickiness and captures the extent to which managers engage in SG&A cost adjustment. ABJ provide large sample evidence of cost stickiness in U.S. firms, followed by a plethora of work that examines underlying mechanisms that lead to this cost behavior. Two primary drivers of stickiness emerge from this literature: (1) adjustment cost theory, and (2) agency theory. Adjustment cost theory is based on economic nature of costs and posits that costs such as resource adjustment costs arise when managers decide to commit to resources. When adjustment costs are larger, managers retain excess resources during periods of sales decreases in order to avoid these costs during periods of higher demands (ABJ 2003). Several studies find evidence in support of adjustment cost theory. For instance, Balakrishnan and Gruca (2008) argue that adjustment costs are higher for functions related to a firm's core competency resulting in higher stickiness of costs related to such functions. Kim and Wang (2014) document that managers of firms in states that provide unemployment benefits are less concerned about labor adjustment costs and therefore such firms exhibit lower cost stickiness. Zhang (2012) argues that product differentiation strategy entails higher adjustment costs and therefore firms pursuing such strategy have higher levels of cost stickiness.

Agency theory of sticky costs is based on the misalignment of interests between managers and shareholders, resulting in managers engaging in empire building activities (Jensen and Meckling 1976). If managers extract private benefits from empire-building, they commit to

additional resources during high demand periods and do not reduce these resources during lean demand periods, resulting in cost stickiness (Anderson et al. 2003). Such stickiness is likely to be over and above the economically determined value of stickiness, resulting in value destruction of the firm. Consistent with the agency cost theory of sticky costs, (Chen et al. 2012) find a positive association between proxies for agency incentives of managers and cost stickiness. In examining a global sample of firms, Cannon, Hu, Lee, and Yang (2016) find that merger and acquisition laws that increase takeover threat reduce cost stickiness, and that such an effect is stronger for firms that are more likely to have higher agency problems.

Impact of External Reporting Choices on SG&A Cost Management Decisions:

External reporting choices of disclosure complexity could interact with the motivations of managers to retain excess resources, thereby influencing SG&A cost adjustment decisions. Prior literature documents strong evidence that opacity of financial statements exacerbates the agency problem between managers and shareholders by reducing the ability of shareholders to monitor actions of managers (Kanodia and Lee 1998; Jensen 1986). Thus, the disciplining role of shareholder diminishes, allowing managers to further engage in empire building activities by expropriating firm resources. One form of such expropriation is retaining excess resources when sales decline to build an empire (Chen et al. 2012). This behavior of managers is also consistent with findings of the downsizing literature which posits that managers are reluctant to downsize because of private benefits (Datta et al. 2010). Complexity could thus promote this behavior by increasing agency conflicts.

In sum, agency theory predicts that managers of firms with complex disclosures are more likely to retain excess resources when sales decline to extract private benefit from these resources, resulting in higher cost stickiness (agency cost channel).

H1A: Under agency cost channel, external reporting choices of disclosure complexity is positively associated with SG&A cost management decisions of adjusting excess resources.

Conversely, high cost of debt (due to complex financial statements) could force managers to rely more on internal funds. It is well known that precautionary motive is a key driver of cash holding by firms (Bates et al. 2009; Opler et al. 1999). Precautionary motive suggests that when cost of external financing is high, shortfall in cash could prevent managers

from investing in profitable projects. Thus, firms tend to hold higher level of liquid assets to mitigate this concern. Since complexity increases cost of debt, precautionary motive predicts that managers could release excess resources to generate funds internally thus leading to lower cost stickiness (internal funds channel).

H1B: Under internal funds channel, external reporting choices of disclosure complexity is negatively associated with SG&A cost management decisions of adjusting excess resources.

A natural follow-up question is the type of SG&A costs being adjusted. Literature identifies SG&A costs and excess resources in them as a value creation tool (Banker et al. 2011) which is valued by capital market (Weiss 2010) as it represents managers expectation of the firm's future (Banker et al. 2008). Given the importance of SG&A costs to a firm, it is natural to examine the "type" of such costs being adjusted.

It is reasonable to assume the presence of an optimal as adding excess resources cannot create additional value perpetually (Geoffrey, Love, and Nohria 2005). It is this theory that Banker et al. (2011) pursue as they identify differential ability of SG&A costs across industries to create future value. They document that the value creation potential of SG&A costs varies based on the industry in which a firm operates. They thereby classify SG&A costs (and thereby excess resources in them) as "value additive" or "non-value additive". If the agency cost channel holds, one should observe no difference the types of SG&A cost being adjusted since increasing excess resources (stickiness) in any type of cost will aid empire building. However, if the internal funds channel holds and managers reduce excess resources (stickiness), it is likely that they will do so within the non-value additive SG&A costs. We therefore pose the following research question:

***RQ**: Do external reporting choices of disclosure complexity have an association with the type of SG&A cost being managed?*

III. SAMPLE AND VARIABLE MEASUREMENT

Sample Selection

To obtain our sample, we identify the firms present in Compustat from 1994 to 2016, with non-missing values for all control variables and machine readable electronic 10-K filings.

Following prior literature, we drop firms with 10-K filings running shorter than 3,000 words or 100 lines of text, excluding tables (Li 2008). Next, we drop financial firms and public utilities (SIC codes 6000-6999 and 4900-4999, respectively) from the sample. Finally, we exclude observations where SG&A costs exceed sales, following the suggestion made by (Banker and Byzalov 2014). This leaves us with a final sample of 25,764 observations on 4,371 firms. Panel A of Table 1 provides the details of our sample selection procedure.

Variable Definitions

Disclosure Complexity and Cost Stickiness

The two key constructs in our analysis are disclosure complexity and cost stickiness. We capture disclosure complexity using the 10-K filing Bog Index as proposed by Bonsall et al. (2017). Starting with (Li 2008), prior literature uses Fog Index proposed by (Gunning 1968). However, Bonsall et al. (2017) demonstrate that only the length of a sentence used in the computation of Fog Index captures the SEC plain English guidelines, and is therefore not a suitable measure for annual report complexity. They further show that Bog Index takes care of plain English attributes proposed by SEC. (Loughran and Mcdonald 2014) also criticize Fog Index and discourage from using it as a measure of disclosure complexity. For the purpose of analysis, we split the Bog Index variable into above and below median value, and create a dummy variable *HighBog* that takes a value of one if Bog Index is above median, and zero otherwise.

To capture cost stickiness, we follow (Anderson et al. 2003) and run the following regression:

$$\Delta lnSGA_{i,t} = \beta_0 + \beta_1 X \Delta lnSales_{i,t} + \beta_2 X \left(\Delta lnSales_{i,t} X DEC_{i,t}\right) + \beta_3 \boldsymbol{Control} + \beta_4 \boldsymbol{Interactions} + \epsilon_{i,t} \quad (1)$$

The variable $\Delta lnSGA_{i,t}$ is the natural log of the ratio of $SGA_{i,t}$ and $SGA_{i,t-1}$, where $SGA_{i,t}$ denotes the SG&A expenses for firm *i* in year *t*. Similarly, $\Delta lnSales_{i,t}$ is the natural log of the ratio of $Sales_{i,t}$ and $Sales_{i,t-1}$, where $Sales_{i,t}$ is the sales revenue for firm *i* in year *t*. $DEC_{i,t}$ is an indicator variable that takes a value of one when sales in year *t* are less than sales in year *t-1*, and zero otherwise. ***Control*** is a vector of control variables, including firm characteristics such as size of the firm (*MVE*), return of assets (*ROA*), leverage (*LEV*), market-

to-book ratio (*MTB*), age of the firm (*Age*), and other control variables used in prior literature such as asset intensity (*ASINT*) and employee intensity (*EMPINT*) to control for adjustment costs, growth rate of GDP (*GDP_GROWTH*) to control for macro-economic environment, propensity to meet or beat zero earnings benchmark (*MBZ*), R&D expenses and free cash flows scaled by total assets (*RD* and *FCF*, respectively). ***Interactions*** are also control variables that include interaction of the variables in the *Control* vector and variables $\Delta lnSGA_{i,t}$ and $\Delta lnSales_{i,t}$. The coefficient β_2 captures the differential change in SG&A costs in response to change in sales. A significantly negative value of β_2 represents cost stickiness. Variable definitions are also provided in Appendix A.

Descriptive Statistics

Panel B of Table 1 presents the descriptive statistics of all the main variables as well as the independent variables of interest. Sales revenue has mean value of $2,275 million, and a median value of $447 million. SG&A costs have a mean value of $410 million, and a median value of $93 million. Approximately 30% of firm-years represent a decline in sales from prior period. These numbers are consistent with those reported in prior literature (Anderson et al. 2003; Liu et al. 2019; Chen et al. 2012; Chen et al. 2019).

The key variable of interest is Bog Index. The data for Bog Index is provided by (Bonsall et al. 2017)[7]. They compute Bog Index using StyleWriter software package, and demonstrate that Bog Index captures plain English characteristics proposed by linguistic experts and mandated by SEC in the plain English Regulation (SEC 1998). The mean value of lagged Bog Index in our sample is 83.83. Based on prior literature, we also test the main prediction using alternative measures of complexity such as Fog Index of the whole 10-K filing, Fog Index of the MD&A section, and file size of 10-K filing. Descriptive statistics of these variables are consistent with prior literature (Li 2008; Loughran and Mcdonald 2014).

Panel C of Table 1 provides descriptive statistics of control variables. The mean value of return on assets (ROA) in our sample is 2%, and the median value is 4%. MBZ has mean value of 0.02, suggesting that 2% of firm-years represent the tendency to meet or beat the zero

[7] The data is available at https://kelley.iu.edu/bpm/activities/bogindex.html

benchmark. The average free cash flow (FCF) and R&D expenses (RD) are 8% and 4% of total assets respectively.

IV. EMPIRICAL RESULTS

Main analyses:

Test of H1A and H1B:

We begin our analysis with a test for *H1*, which predicts that complexity of disclosures significantly impacts the stickiness of SG&A costs. To test this hypothesis, we estimate the following regression model:

$$\Delta\ln SGA_{i,t} = \beta_0 + \gamma_0 \Delta\ln Sales_{i,t} + \gamma_1 Highcomplex_{i,t-1} + \gamma_2 X (\Delta\ln Sales_{i,t} X DEC_{i,t}) + \gamma_3 X (Highcomplex_{i,t-1} \times \Delta\ln Sales_{i,t}) + \gamma_4 X (Highcomplex_{i,t-1} X \Delta\ln Sales_{i,t} X DEC_{i,t}) + \gamma_5 Controls + \gamma_6 Interactions + \gamma_7 Industry\ Dummies + \gamma_8 Year\ Dummies + \epsilon_{i,t} \quad (2)$$

where $HighComplex_{i,t-1}$ is an indicator variable that takes a value of one if the value of Bog Index for a firm is above median in the year *t-1*. All other variables are as discussed in the previous section. Interactions include double and triple interaction terms of $HighComplex_{i,t-1}$ and $\Delta\ln Sales_{i,t}$ with all control variables. We also control for industry and year dummies to control for unobserved time invariant variables along these dimensions. We report *t*-statistics calculated based on standard errors clustered at industry and year level to alleviate the concern of cross-sectional and time series dependence of standard errors (Gow et al. 2010). A negative γ_2 would indicate that SG&A cost are sticky. Of our interest is the coefficient γ_4 . A negative γ_4 would indicate that costs get more sticky (i.e. managers retain more excess resources) following complex disclosures and would lend support to *H1A.* On the other hand, a positive γ_4 would indicate that stickiness reduces (i.e. managers reduce/use up excess resources) following complex disclosures and would lend support to *H1B.*

Panel A of Table 2 presents the results from the regression in model (2) done on the sample of US Compustat firms. Column (1) shows the regression without the use of any control variables while Column (2) and (3) show regression results with all control variables and interactions. A negative coefficient γ_2 on $\Delta\ln Sales_{i,t} X DEC_{i,t}$ indicates that costs are in-fact sticky and are in line with findings of prior literature. Column (2) accounts for industry fixed

effects and represents a cross-sectional design. A positive coefficient γ_4 on $\text{Highcomplex}_{i,t-1}\ X\ \Delta\text{lnSales}_{i,t}\ X\ DEC_{i,t}$ indicates that on average, stickiness reduces for firms with relatively complex disclosures. Specifically, as complexity moves from its below median value to above median value, SG&A cost stickiness reduces by approximately 13.8% (0.0692/0.5008) in the following period. Column (3) accounts for firm fixed effects and represents a within firm design. This design mitigates concerns regarding static omitted variables inducing spurious correlation between the dependent and independent variables. A positive coefficient γ_4 on $H\text{ighcomplex}_{i,t-1}\ X\ \Delta\text{lnSales}_{i,t}\ X\ DEC_{i,t}$ indicates that as a firm moves from below median values of complexity to above median values, SG&A cost stickiness reduces by approximately 23.1% (0.0828/0.3577) in the following period. Taken together, these findings are consistent with the internal funds channel explanation and lend support to *H1B* suggesting that external reporting choices of complex disclosures force managers to lower cost stickiness thus influencing SG&A cost management decisions . Consequently, *H1A* is not supported.[8]

Since both the dependent and independent variables in our analysis are subject to managerial discretion, the results could be biased by endogeneity. To mitigate these concerns, we supplement our analysis with a quasi-natural experimental design which employs the SFAS 133 as an exogenous shock to disclosure complexity. SFAS 133 is a well-documented shock to disclosure complexity (Guay et al. 2016). SFAS 133 was adopted from June 15, 2000 and it mandated the disclosure of cash flow hedges that essentially provide a hedge in volatility of future cash flows. This regulation led to complex disclosures. Campbell (2015) quotes it as "incomplete and complex." Consequently, we use SFAS 133 as an appropriate shock wherein the treatment firms are those that report unrealized gains and losses on derivatives in accumulated other comprehensive income in the 3 years prior (after) the event with a matched sample for control firms. This allows us to create a difference-in-difference (DID) setting.

Before testing the impact of increase in complexity on SG&A cost management decisions, we present the results of univariate change in complexity of disclosures in Panel B of Table 2. The change in complexity (Bog Index of 10-K) of disclosures for the treatment firms increased

[8] We use MD&A Fog index, the Fog Index (Li 2008) and File size of 10-K (Loughran and Mcdonald 2014) as alternative measures of 10-K complexity. Results of estimating equation (2) are qualitatively similar.

significantly post SFAS 133 legislation while control firms experienced insignificant changes. We now employ the quasi-natural experiment setting to test the main hypotheses *H1*. The results are presented in Panel C of Table 2. A positive and significant coefficient on the three way interaction $Event \times \Delta lnSales \times DEC$ in Panel C of Table 2 indicates that post the adoption of SFAS 133, treatment firms reduced their stickiness by a significantly larger amount as compared to control firms. This indicates that the choice decision of managers is to reduce the excess resources in the firm when the complexity of disclosures increases (exogenously).

Panel D of Table 2 documents a deeper analysis of the DID coefficient presented in Panel C. We find that the DID coefficient is solely driven by changes in treatment set of firms, and not in control firms. Specifically, the stickiness in treatment firms reduces after the adoption of SFAS 133, as suggested by the coefficient of 0.2574, which is statistically significant. However, there is no change in the stickiness of control firms, as suggested by an insignificant coefficient of -0.1856. Overall, results from the quasi-natural experimental setting support our main analysis and suggest that disclosure complexity leads to a reduction in cost stickiness.

Test of *RQ*:

We next proceed to test our *RQ* and explore the types of SG&A costs being adjusted. We use Banker et al. (2011) to measure future value creation ability of SG&A costs. Since we find that managers reduce stickiness following complex disclosures, it is tenable that only those SG&A cost that have low future value creation ability will be affected. To test this, we conduct equation (2) by subsampling firms that have SG&A costs with low value creation ability and those firms with high value creation ability. Results from running the analyses on the cross-section of all US firms on Compustat are presented in Panel A of Table 3. As predicted, only those firms that have SG&A costs with low value creation ability reduce cost stickiness following complex disclosures (positive coefficient γ_4 (0.0887) in column (1) and insignificant coefficient (0.0523) in column (2)). Results from applying such a sample split under the quasi-natural experimental setting are presented in Panel B of Table 3 and yield similar results. Overall, these results suggest that managers reduce non-value additive SG&A

resources when complex disclosures are issued, thus answering the *RQ*.[9]

Additional analyses:

Test for the Mediating Effect of Cost of Borrowing

Our main analyses show that external reporting choices of disclosure complexity influences SG&A cost management decisions, in that, managers reduce SG&A cost stickiness following complex disclosures. We predict that such a negative relationship between complexity and stickiness is manifested because raising external funds becomes harder following complex disclosures. This in-turn forces managers to cut SG&A resources in lean demand periods. To test whether this is indeed the mechanism through which the relationship is manifested we conduct a mediation test of the relationship between complexity and stickiness using cost of borrowing as a mediator. Following prior literature, we use loan spread over LIBOR on the date of debt origination as a measure of cost of bank debt (Bharath et al. 2011). Loan Pricing Corporation (LPC) provides information on loan pricing in the database *DealScan*. We use the natural log of *AllInDrawn* variable (*COD*) from DealScan to capture the cost of bank debt. *AllinDrawn* is measured at loan level, so we use its weighted mean value across all loans for each firm in each year, before taking its natural log.

To test the mediation effect, we use the mediation test proposed by (Goodman 1960) and (Sobel 1982), and estimate the following regressions[10]

Model A: $DV = \beta_0 + \tau IV + \epsilon_1$

Model B: $MV = \beta_0 + \alpha IV + \epsilon_2$

Model C: $DV = \beta_0 + \tau' IV + \beta MV + \epsilon_3$

[9] We use MD&A Fog index, the Fog Index (Li 2008) and File size of 10-K (Loughran and Mcdonald 2014) as alternative measures of 10-K complexity. Results for the test of RQ are qualitatively similar.

[10] We use STATA package *sgmediation* to estimates these models. The package displays the mediation effect as one of the output parameters.

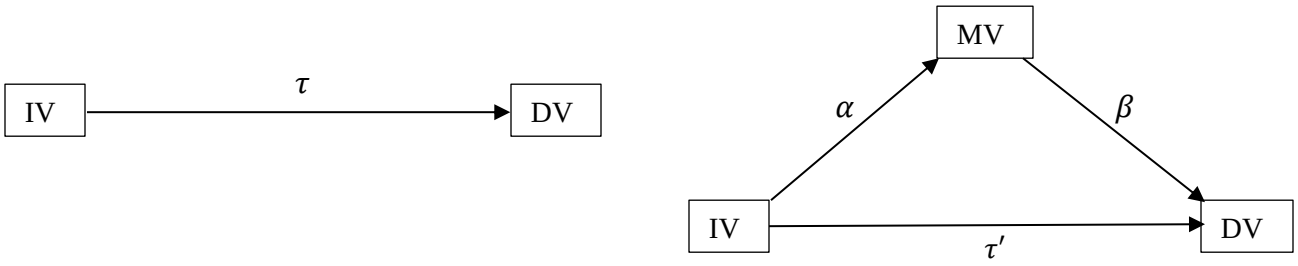

Figure 1: Mediation Effect of Cost of Debt on the Relation between Financial Statement Complexity and Cost Stickiness

To test the mediation effect using these models, we need to create the dependent variable (*DV*), mediating variable (*MV*), and independent variables (*IV).* We define the DV, MV and IV as follows:

$DV: \Delta lnSGA_{i,t}$

$MV: \left(COD_{i,t} \times \Delta lnSales_{i,t} \times DEC_{i,t}\right)$

$IV: \left(Highcomplex_{i,t-1} \times \Delta lnSales_{i,t} \times DEC_{i,t}\right)$

These definitions are based on Equation (2). IV captures the differential effect of complexity on cost of debt and cost stickiness between periods of sales increase and sales decrease. Similarly, MV captures the differential effect of cost of debt on cost stickiness between periods of sales increase and sales decline. Similar to Equation (2), the DV is $\Delta lnSGA_{i,t}$.

Table 4 presents the mediation test results. The coefficient α when *MV* is regressed on *IV* **(Model B)** is 0.7442 (*Z* = + 15.77). This suggests that that increase in complexity is significantly and positively associated with an increase in cost of debt. The coefficient β when *DV* is regressed on *MV* and *IV* **(Model C)** is -0.1999 (*Z* = - 13.33), and coefficient τ' from the same model is -0.1040 (*Z* = - 0.9127). The mediating effect, or the indirect effect, computed as the product of α and β, is -0.1487 (*Z* = -10.18) and is both, statistically and economically significant. The mediating effect of cost of debt is approximately 59% of the total effect of complexity on cost stickiness. The analysis also suggests that the direct effect between complexity and cost stickiness (τ') is insignificant showing that the entire effect of complexity on cost stickiness is via cost of debt. The total effect of Bog Index on Cost Stickiness is -0.2527 (*Z* = -2.2210).

Cross-Sectional Tests

To triangulate our main findings, we conduct a series of cross-sectional tests and also investigate the effect of reduced cost stickiness on other firm outcomes. First, we examine whether the relation between complexity and cost stickiness varies with the investment efficiency of a firm and whether reducing stickiness has an impact on investment outcomes. Next, we examine two other cross-sectional tests to study whether the relation between complexity and cost stickiness varies with the firm's information environment. To do so we study whether the relationship varies with the 1) vulnerability of a firm to an increase in cost of debt (financial constraints) and 2) financial reporting quality.

Who is reducing stickiness? - The Role of Investment Efficiency

If complex disclosures increase the cost of external financing and make such financing harder to obtain (as suggested by our previous analyses), firms most affected by such an outcome and in need of internal funds would be the those that are already below optimal investment levels. Using the residual measure by Biddle et al. (2009), we classify firms as either underinvesting or overinvesting in time *t-1* (complex disclosures issued at end of *t-1*) and conduct equation (2) for such subsamples. If the need for internal funds is indeed driving firms to reduce stickiness in response to complexity, our main results should be pronounced in the subsample of underinvesting firms. Results as in Panel A of Table 5 support this prediction and show that while overinvesting firms do not reduce stickiness following a complex disclosure, underinvesting firms do so by approximately 14.7% (0.0821/0.5562).[11]Similar results emerge when conducting such sample split under the quasi-natural experimental setting (see Panel B of Table 5)

We further investigate whether managers use internal funds generated by reduced stickiness to indeed make investments. Since stickiness and its reduction thereof is now our independent variable, we need to capture it via a specific measure. We adopt the measure by Weiss (2010). Results are presented in Panel C of Table 5. Results show that among the firms

[11] We also use the ranking measure by Biddle et al. (2009) as an alternate measure to classify firms as under and overinvesting and for any analyses thereof. Results are qualitatively similar

who were under-investors in t-1, those that reduced stickiness following complex disclosures experienced a decrease in the likelihood of being under-investors in year *t+1* (significant coefficient on the interaction of *Stickiness Reduction* * $HighComplex_{t-1}$). Therefore, reducing stickiness does generate internal funds that are in-turn used for making investments.

Other cross-sectional tests – The Role of Financial Constraints and Analyst Forecast Error

Financial constraints introduce a wedge between firms' internal and external cost of funds, making external funds costlier than internal funds (Campbell et al. 2012). Therefore, financially constrained firms rely more on internal funds to execute operating and investing activities. If such firms produce complex financial statements, their cost of external financing further increases, making these firms further reliant on internal funds (Opler et al. 1999). One potential way to increase the availability of internal funds is to reduce excess resources in the form of SG&A costs during low demand periods, leading to reduced cost stickiness. Thus, if precautionary motives drive our main finding of a negative relation between complexity and cost stickiness, the relationship should be stronger for financially constrained firms.

To measure financial constraint we use the KZ Index[12], proposed by (Kaplan and Zingales 1995), at the beginning of the year *t*. We create a dummy variable that takes a value of 1 if the financial constraint measure at the beginning of year *t* is above median value, and zero otherwise. Panel A of Table 6 presents the results of this test on the cross-section of all US firms on Compustat. We find that firms with higher financial constraints have a more pronounced reduction in cost stickiness following complex disclosures (approximately 15.4% (0.0850/0.5508)).[13]Results from running such a cross-sectional test under the quasi-natural experimental setting are presented in Panel B of Table 6 and are qualitatively similar.

Next, we examine the role of analyst forecast error (AFE) in shaping the relation between complexity and cost stickiness. Analysts disseminate useful information to market participants (Piotroski and Roulstone 2005), and analyst forecast characteristics have a significant influence on equity prices (Barth and Hutton 2004), as well as cost of debt (Mansi et al. 2011). Not

[12] KZ Index = (-1.001909 * oancf / at) + (0.2826389 * (at- (prcc_f*csho) -ceq)) + (3.139193 * ((dltt+dlc) / at)) + (-39.3678 * dvc / at) + (-1.314759 * che / at). All variable names are as defined in COMPUSTAT

[13] As alternate measures of financial constraint, we use the SA Index and the Hoberg and Macksomovic (2015) measure using text-based information. Our results form the cross-sectional tests continue to hold

surprisingly, when 10-K filings are less readable, the demand for information generated by analysts increases (Lehavy et al. 2011). When such information is less accurate, the information risk arising out of complex of 10-K disclosures could further increase, resulting in higher agency cost of debt. Thus, analyst forecast accuracy could moderate the relation between complexity and cost stickiness via cost of debt channel. We measure analyst forecast error (AFE) as the difference between recent consensus analyst EPS forecast and the actual EPS from IBES files, scaled by stock price at the beginning of the year. We estimate equation (2) on subsamples based on value of high versus low values of AFE. Panel A of Table 7 presents the result from this test run on the cross-section of all US firms on Compustat. We find that firms with high AFE in have a more pronounced reduction in cost stickiness following complex disclosures (approximately 14.4% (0.0938/0.6528)). Results from running such a cross-sectional test under the quasi-natural experimental setting are presented in Panel B of Table 7 and are qualitatively similar.

CONCLUSION

Managers issue complex disclosures for a variety of reasons, including hiding poor performance or hiding empire building motives. However, the decision to issue a complex annual report entails negative consequences such as higher cost of borrowing. Managers have a choice to either reduce the complexity of 10-K filings or to take some other steps to mitigate the increased borrowing cost. If managers issued complex reports to hide poor performance, it is unlikely they will reduce the complexity. Thus, there must be alternatives that they could exercise to meet their need for funds. One such avenue is reducing investment in unused resources in the firm. Motivated by this argument, this paper examines the impact of annual report complexity on SG&A cost management decision, specifically, excess resource reduction decision of a firm.

We document robust evidence of a significant positive association between complexity of annual reports and excess resource reduction. Further, the reduction in excess resources is observed when the value creation potential of these resources is low. Moreover, we identify that the reduction in excess resources is significantly higher for firms that face a higher cost of

borrowing, firms that underinvest, firms that are financially constrained, and firms that have a poor information environment. Such reduction is also associated with improved investment efficiency in the next period, implying that the generation of internal funds allows managers to invest better.

Our study offers useful avenues for future research. First, future research could examine the cross-sectional variation in reduction in excess resources and other SG&A cost management decisions based on the motivation of managers behind issuing complex annual reports. Second, it would be interesting to document if investors react positively to reduction in excess resources as a response to issuance of complex annual reports. This is of particular importance because our study documents that managers cut non-value additive SG&A costs. Therefore, it is expected that investors would react positively to this reduction in SG&A expenses. Finally, future research could examine the role of tone of disclosures in excess resource reduction. Prior literature documents that managers use tone of disclosures to manager investor expectations. It should be interesting to examine if managers use optimistic tone to mitigate increased cost of borrowing as a result of complexity of 10-K filings.

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Table 1:

Panel A: Sample Selection

	Dropped	**Sample Size**
COMPUSTAT observations with valid 10-K filings and BOG Index data		122,915
Drop Financial and Utility Firms	(31,159)	91,756
Drop if SGA costs > Sales Revenue	(15,716)	76,040
Drop observations with missing lags of BOG Index, SG&A costs, and sales revenues	(45,973)	30,067
Drop missing observations for control variables	(4,279)	25,788
Firm – Year Sample		**25,788**

Panel B: Variable Description

Variable	**Notation**	**Definition/Measurement**	**Level**
Log Change in SG&A costs	$\Delta lnSGA$	ln (SGA_t / SGA_{t-1})	Firm-Year
Log Change in Sales Revenue	$\Delta lnSale$	ln ($Sales_t$ / $Sales_{t-1}$)	Firm-Year
Decrease in Sales indicator	*DEC*	DEC=1 if $Sales_t < Sales_{t-1}$, 0 otherwise	Firm-Year
File size of 10-K	BOG_{t-1}	Sourced from Bonsall et al. (2017).	Firm-Year
Return on Assets	*roa*	Income before extraordinary items / Total Assets	Firm-Year
Size of the firm	*log_mve*	ln (stock price * number of shares outstanding)	Firm-Year
Book Leverage	*lev*	(Long Term Debt + Debt in current liabilities) / Total Assets	Firm-Year
Market-to-Book Ratio	*mtb*	(stock price * number of shares outstanding) / Shareholders Equity	Firm-Year
Age of the firm	*age*	Number of years in COMPUSTAT since IPO	Firm-Year
Asset Intensity	*asint*	ln (Total Assets / Sales Revenue)	Firm-Year
Employee Intensity	*empint*	ln (Total Employees / Sales Revenue)	Firm-Year
Annual GDP Growth Rate	*GDP_Growth*	Sourced from World Bank	Year
Small Positive Profits Indicator	*MBZ*	MBZ = 1 if roa is between 0 and 0.5 percent, 0 otherwise	Firm-Year
Research and Development Expenses	*RD*	R&D expenses / Total Assets	Firm-Year
Free Cash Flow	*FCF*	(Cash Flow from operations – dividends / Total Assets	Firm-Year

Panel C: Descriptive Statistics

Variable	Obs	Mean	SD	P25	Median	P75
Cost Related Variables						
Sales (USD million)	25,788	2,265	5,851	126	445	1,577
SG&A (USD million)	25,788	408	1,020	30	93	296
$\Delta lnSale$	25,788	0.07	0.21	-0.02	0.07	0.17
$\Delta lnSGA$	25,788	0.07	0.18	-0.02	0.06	0.15
DEC_t	25,788	0.30	0.46			
Independent Variable(s)						
Bog_{t-1}	25,788	83.83	6.71	79.00	84.00	88.00
Fog_{t-1}	25,788	21.01	1.68	20.01	20.80	21.67
Fog_MDA_{t-1}	25,788	19.32	1.42	18.41	19.31	20.23
$Filesize_{t-1}$ *(Net)*	25,788	12.59	0.54	12.26	12.58	12.92
Control Variables						
ROA	25,788	0.02	0.13	-0.00	0.04	0.08
MVE	25,788	6.10	2.06	4.67	6.15	7.49
Leverage	25,788	0.21	0.21	0.01	0.17	0.33
MTB	25,788	2.72	3.49	1.17	1.96	3.36
Age	25,788	2.19	0.52	1.79	2.20	2.64
ASINT	25,788	-0.00	0.64	-0.43	-0.02	0.41
EMPINT	25,788	-5.56	0.86	-6.01	-5.52	-5.07
GDP_Growth	25,788	2.10	1.73	1.68	2.53	2.86
DEC_{t-1}	25,788	0.32	0.47	0.00	0.00	1.00
MBZ	25,788	0.02	0.14	0.00	0.00	0.00
RD	25,788	0.04	0.06	0.00	0.00	0.05
FCF	25,788	0.08	0.09	0.03	0.08	0.13

Table 2: Impact of Disclosure Complexity on SG&A Cost Adjustment

Panel A: OLS with Industry Fixed Effects and Within-Firm Design

Column (1) establishes cost stickiness in full sample. Cols (2) employs Industry-Year fixed effects, while Cols (3) employs Firm-Year fixed effects. $HighComplex_{t-1}$ dummy is equal to one when Bog index of 10-K is above median. Robust standard errors clustered at Industry-Year level.

Following regression is executed:

$$\Delta lnSGA_{i,t} = \beta_0 + \gamma_0 \Delta lnSales_{i,t} + \gamma_1 Highcomplex_{i,t-1} + \gamma_2 X (\Delta lnSales_{i,t} X DEC_{i,t}) + \gamma_3 X (Highcomplex_{i,t-1} \times \Delta lnSales_{i,t}) + \gamma_4 X (Highcomplex_{i,t-1} X \Delta lnSales_{i,t} X DEC_{i,t}) + \gamma_5 Controls + \gamma_6 Interactions + \gamma_7 Industry\ Dummies + \gamma_8 Year\ Dummies + \epsilon_{i,t}$$

VARIABLES	(1) ΔlnSGA	(2) ΔlnSGA	(3) ΔlnSGA
ΔlnSale	0.6416***	0.9809***	0.9100***
	(47.7832)	(12.5171)	(10.4361)
$HighComplex_{t-1}$		-0.0028	-0.0046
		(-1.1350)	(-1.3009)
ΔlnSale x DEC	-0.2531***	-0.5008***	-0.3577**
	(-9.7580)	(-3.2741)	(-2.1383)
ΔlnSale x $HighComplex_{t-1}$		-0.0052	-0.0041
		(-0.3200)	(-0.2111)
$HighComplex_{t-1}$ x ΔlnSale x DEC		**0.0692****	**0.0828****
		(2.3191)	**(2.3239)**
Control Variables (Main Effects)		Yes	Yes
Control Variables *x ΔlnSale x DEC*		Yes	Yes
Control Variables *x ΔlnSale*		Yes	Yes
Observations	25,788	25,788	25,788
R-squared	0.477	0.514	0.627
Firm Fixed Effects	No	No	Yes
Industry Fixed Effects	Yes	Yes	No
Year Fixed Effects	Yes	Yes	Yes

Panel B: Univariate changes in Complexity post the adoption of SFAS 133

This table presents the impact of change in disclosure complexity on stickiness. The event represents an exogenous shock to disclosure complexity for firms effected by SFAS 133.

	Treatment		**Control**		**DID**	**p-value**
	Pre-SFAS 133	Post-SFAS 133	Pre-SFAS 133	Post-SFAS 133		
$Bog\ Index_{t-1}$	78.83	81.71	79.88	81.35	1.41	0.004
$Fog\ Index_{t-1}$	20.24	20.27	20.56	20.05	0.53	0.012
$Fog\ MDA_{t-1}$	18.80	18.87	18.99	18.73	0.33	0.005
$File\ Size_{t-1}$	12.35	12.60	12.34	12.50	0.09	0.045

Panel C: Impact of Mandatory Adoption of SFAS 133 on Cost Stickiness

The "treat" firms are affected by SFAS 133 and have higher complexity in the post period. "Post" is a dummy with value one after the adoption of SFAS 133.

VARIABLES	ΔlnSGA
ΔlnSale	0.7020***
	(21.8816)
ΔlnSale x DEC	**-0.2380****
	(-2.2239)
Event	0.0343**
	(2.5600)
ΔlnSale x Event	-0.0664
	(-1.0552)
DEC x Event	-0.0140
	(-0.8609)
ΔlnSale x DEC x Event	**0.4429****
	(2.4276)
ΔlnSale x DEC x Post	-0.1856
	(-1.4010)
ΔlnSale x DEC x Treat	-0.1857
	(-1.3452)
Treat	-0.0073
	(-0.8563)
Post	-0.0463***
	(-4.9905)
Observations	2,859
R-squared	0.508
Firm Fixed Effects	Yes
Year Fixed Effects	Yes

Panel D: Impact of Mandatory Adoption of SFAS 133 on Cost Stickiness

	Pre-SFAS 133	**Post-SFAS 133**	**Difference**
Treatment	-0.4237***	-0.1663**	0.2574**
Control	-0.2380***	-0.4236***	-0.1856
DID		**0.4429****	

Table 3: Impact of Disclosure Complexity on SG&A Cost Adjustment - Role of Future Value of SG&A

Panel A: OLS with Fixed Effects

This test presents the impact of complexity on cost stickiness based on variation in future value creation potential of SG&A resources. Low (High) future value subsample is based on firms in industries with low (high) future value creation potential of SG&A measured using (Banker, Huang, & Natarajan, 2011). Complexity is measured using 10K Bog Index. The regression executed is specified below and fixed effects along with clustering at Industry-Year level is employed.

$$\Delta\ln SGA_{i,t} = \beta_0 + \gamma_0 \Delta\ln Sales_{i,t} + \gamma_1 Highcomplex_{i,t-1} + \gamma_2 X (\Delta\ln Sales_{i,t} X DEC_{i,t}) + \gamma_3 X (Highcomplex_{i,t-1} \times \Delta\ln Sales_{i,t}) + \gamma_4 X (Highcomplex_{i,t-1} X \Delta\ln Sales_{i,t} X DEC_{i,t}) + \gamma_5 Controls + \gamma_6 Interactions + \gamma_7 Industry\ Dummies + \gamma_8 Year\ Dummies + \epsilon_{i,t}$$

	(1) Low Future Value	(2) High Future Value
VARIABLES	ΔlnSGA	ΔlnSGA
ΔlnSale	1.0256***	0.9210***
	(0.097)	(0.104)
$HighComplex_{t-1}$	0.0011	-0.0066*
	(0.004)	(0.003)
ΔlnSale x DEC	-0.5301***	-0.4782**
	(0.197)	(0.200)
ΔlnSale x $HighComplex_{t-1}$	-0.0181	0.0105
	(0.022)	(0.024)
$HighComplex_{t-1}$ x ΔlnSale x DEC	**0.0887****	**0.0523**
	(0.042)	**(0.047)**
Control Variables *x Δ$lnSale$ x DEC*	YES	YES
Control Variables *x Δ$lnSale$*	YES	YES
Control Variables (Main Effects)	YES	YES
Observations	12,894	12,894
R-squared	0.549	0.482
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Panel B: Quasi Natural Experiment

This test presents the impact of complexity on cost stickiness based on variation in future value creation potential of SG&A resources. The analysis is based on the SFAS 133 adoption setting wherein Low (High) future value subsample is based on firms in industries with low (high) future value creation potential of SG&A measured using (Banker, Huang, & Natarajan, 2011). Complexity is measured using 10K Bog Index. The regression executed is specified below and fixed effects along with clustering at Industry-Year level is employed.

$$\Delta\ln SGA_{i,t} = \beta_0 + \gamma_0 \Delta\ln Sales_{i,t} + \gamma_1 Highcomplex_{i,t-1} + \gamma_2 X (\Delta\ln Sales_{i,t} X DEC_{i,t}) + \gamma_3 X (Highcomplex_{i,t-1} \times \Delta\ln Sales_{i,t}) + \gamma_4 X (Highcomplex_{i,t-1} X \Delta\ln Sales_{i,t} X DEC_{i,t}) + \gamma_5 Controls + \gamma_6 Interactions + \gamma_7 Industry\ Dummies + \gamma_8 Year\ Dummies + \epsilon_{i,t}$$

	(1) Low Future Value	(2) High Future Value
VARIABLES	ΔlnSGA	ΔlnSGA
ΔlnSale	0.7270***	0.6620***
	(0.038)	(0.056)
ΔlnSale x DEC	**-0.2642****	**-0.2072**
	(0.125)	**(0.180)**
Event	0.0481**	0.0206
	(0.020)	(0.017)
ΔlnSale x Event	-0.1014	-0.0178
	(0.072)	(0.093)
DEC x Event	-0.0253	0.0106
	(0.023)	(0.023)
ΔlnSale x DEC x Event	**1.0218****	**0.1775**
	(0.399)	**(0.208)**
ΔlnSale x DEC x Post	-0.2472	-0.1418
	(0.174)	(0.188)
ΔlnSale x DEC x Treat	-0.6422*	-0.0360
	(0.335)	(0.186)
Treat	-0.0111	-0.0047
	(0.012)	(0.015)
Post	-0.0499***	-0.0452***
	(0.014)	(0.012)
	1,458	1,400
R-squared	0.549	0.482
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Table 4: Impact of Financial Statement Complexity on Cost Stickiness: Mediation Test

The below mediation test examines the direct effect of disclosure complexity on cost stickiness. The indirect effect is the impact of disclosure complexity via cost of debt on cost stickiness.

Goodman and Sobel Mediation Test – Cost Stickiness measured as proposed by (Anderson et al. 2003)

	Coefficient	*Std Err*	*Z*	*P>Z*
α coefficient (Model B)	0.7442	0.0472	15.7662	0.0000
β coefficient (Model C)	-0.1999	0.0150	-13.3347	0.0000
Indirect Effect (α x β)	-0.1487	0.0146	-10.1814	0.0000
Direct Effect (τ')(Model A)	-0.1040	0.1140	-0.9127	0.3614
Total Effect ($\tau = \tau' + \alpha$ x β)	-0.2527	0.1138	-2.2210	0.0264

Proportion of total effect that is mediated: **0.5885**
Ratio of indirect to direct effect: 1.4302
Ratio of total to direct effect: 2.4302

Model A: $DV = \beta_0 + \tau IV + \epsilon_1$

Model B: $MV = \beta_0 + \alpha IV + \epsilon_2$

Model C: $DV = \beta_0 + \tau' IV + \beta MV + \epsilon_3$

Where,

$DV: \Delta lnSales_{i,t}$
$MV: (COD_{i,t} \times \Delta lnSales_{i,t} \times DEC_{i,t})$
$IV: (HighBog_{i,t-1} \times \Delta lnSales_{i,t} \times DEC_{i,t})$

Table 5: Impact of Disclosure Complexity on SG&A Cost Adjustment

Panel A - Underinvestment Vs Overinvestment

This test presents the impact of complexity on cost stickiness based on variation in Investment levels prior to disclosure. Under-Invested (Over-Invested) subsample is based on firms with investment below (above) optimal level measured using (Biddle, Hilary, & Verdi, 2009). Complexity is measured using 10K Bog Index. The regression executed is specified below and fixed effects along with clustering at Industry-Year level is employed.

$$\Delta\ln SGA_{i,t} = \beta_0 + \gamma_0 \Delta\ln Sales_{i,t} + \gamma_1 Highcomplex_{i,t-1} + \gamma_2 X (\Delta\ln Sales_{i,t} X DEC_{i,t}) + \gamma_3 X (Highcomplex_{i,t-1} \times \Delta\ln Sales_{i,t}) + \gamma_4 X (Highcomplex_{i,t-1} X \Delta\ln Sales_{i,t} X DEC_{i,t}) + \gamma_5 Controls + \gamma_6 Interactions + \gamma_7 Industry\ Dummies + \gamma_8 Year\ Dummies + \epsilon_{i,t}$$

	(1) Underinvesting firms – residual method	(2) Overinvesting firms – residual method
VARIABLES	ΔlnSGA	ΔlnSGA
ΔlnSale	0.9714***	0.8588***
	(0.102)	(0.121)
$HighComplex_{t-1}$	-0.0039	-0.0005
	(0.003)	(0.004)
ΔlnSale x DEC	-0.5562***	-0.1669
	(0.201)	(0.247)
ΔlnSale x $HighComplex_{t-1}$	-0.0092	-0.0160
	(0.022)	(0.026)
$HighComplex_{t-1}$ x ΔlnSale x DEC	**0.0821****	**0.0546**
	(0.041)	**(0.049)**
Control Variables *x Δ*lnSale x DEC*	YES	YES
Control Variables *x Δ*lnSale*	YES	YES
Control Variables (Main Effects)	YES	YES
Observations	13,572	10,119
R-squared	0.513	0.508
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Panel B: ***Underinvestment Vs Overinvestment*** **- Quasi Natural Experiment**

This test presents the impact of complexity on cost stickiness based on variation in Investment levels prior to disclosure using SFAS 133 as a quasi-natural experimental setting. Under-Invested (Over-Invested) subsample is based on firms with investment below (above) optimal level measured using (Biddle, Hilary, & Verdi, 2009). Complexity is measured using 10K Bog Index.

	(1) Underinvesting firms – residual method	(2) Overinvesting firms – residual method
VARIABLES	ΔlnSGA	ΔlnSGA
ΔlnSale	0.7664***	0.6251***
	(0.036)	(0.051)
ΔlnSale x DEC	-0.2594	-0.1874
	(0.190)	(0.120)
Event	0.0442**	0.0326
	(0.019)	(0.023)
ΔlnSale x Event	-0.1248*	-0.0238
	(0.068)	(0.102)
DEC x Event	-0.0149	-0.0206
	(0.022)	(0.028)
ΔlnSale x DEC x Event	**0.5609****	**0.3123**
	(0.243)	**(0.293)**
ΔlnSale x DEC x Post	-0.1300	-0.2423*
	(0.211)	(0.134)
ΔlnSale x DEC x Treat	-0.2098	-0.1749
	(0.189)	(0.252)
Treat	-0.0180	0.0022
	(0.012)	(0.016)
Post	-0.0323***	-0.0619***
	(0.011)	(0.015)
	1,573	1,283
R-squared	0.549	0.482
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

`

Panel C – Likelihood of Underinvestment

This test presents the probability of staying underinvested post reduction of SG&A resources in period t. This analysis is for the subsample of firms that are underinvested in prior period. Under-Invested identification is based on firms with investment below optimal level measured using (Biddle, Hilary, & Verdi, 2009). Complexity is measured using 10K Bog Index.

	(1)	(2)
		$Under_{t+1}$
VARIABLES	**Coefficient**	**Marginal Effect**
Stickiness Reduction	0.1211**	0.0257**
	(0.061)	(0.013)
$HighComplex_{t-1}$	0.2454***	0.0521***
	(0.072)	(0.015)
Stickiness Reduction * $HighComplex_{t-1}$	**-0.2346*** **	**-0.0498*** **
	(0.086)	**(0.018)**
Roa	0.1642	0.0348
	(0.276)	(0.059)
LOG_MVE	-0.2959***	-0.0628***
	(0.051)	(0.011)
Age	-0.0058	-0.0012
	(0.094)	(0.020)
Size	0.2880***	0.0611***
	(0.054)	(0.011)
Lev	-0.1982	-0.0421
	(0.183)	(0.039)
Eqissue	-0.1321*	-0.0280*
	(0.074)	(0.016)
Debtissue	-0.0310	-0.0066
	(0.058)	(0.012)
Constant	1.5957***	
	(0.588)	
Observations	8,244	
Firm Fixed Effects	Yes	
Year Fixed Effects	Yes	

Table 6: Impact of Disclosure Complexity on Cost Stickiness – High Versus Low Financial Constraint

Panel A: OLS with Fixed Effects

This test presents the impact of complexity on cost stickiness based on variation in financial constraint in the firm prior to disclosure. The level of constraint is measured using KZ Index (Kaplan and Zingales 1995). Firm is financially constrained if its KZ index is above median. Complexity is measured using 10K Bog Index. The regression executed is specified below and fixed effects along with clustering at Industry-Year level is employed.

$$\Delta\ln SGA_{i,t} = \beta_0 + \gamma_0 \Delta\ln Sales_{i,t} + \gamma_1 Highcomplex_{i,t-1} + \gamma_2 X (\Delta\ln Sales_{i,t} X DEC_{i,t}) + \gamma_3 X (Highcomplex_{i,t-1} \times \Delta\ln Sales_{i,t}) + \gamma_4 X (Highcomplex_{i,t-1} X \Delta\ln Sales_{i,t} X DEC_{i,t}) + \gamma_5 Controls + \gamma_6 Interactions + \gamma_7 Industry\ Dummies + \gamma_8 Year\ Dummies + \epsilon_{i,t}$$

	(1) High Financial Constraint	(2) Low Financial Constraint
VARIABLES	ΔlnSGA	ΔlnSGA
ΔlnSale	0.9188***	1.0303***
	(12.3503)	(11.6916)
$HighComplex_{t-1}$	-0.0063*	-0.0021
	(-1.7214)	(-0.6145)
ΔlnSale x DEC	-0.4420***	-0.4680**
	(-3.5336)	(-2.2480)
ΔlnSale x $HighComplex_{t-1}$	0.0115	-0.0021
	(0.6155)	(-0.0966)
$HighComplex_{t-1}$ x ΔlnSale x DEC	**0.0648****	**0.0217**
	(2.0162)	**(0.4308)**
Control Variables *x* Δ*lnSale x DEC*	YES	YES
Control Variables *x* Δ*lnSale*	YES	YES
Control Variables (Main Effects)	YES	YES
Observations	12,889	12,899
R-squared	0.476	0.543
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Panel B: Quasi Natural Experiment

This test presents the impact of complexity on cost stickiness based on variation in financial constraint in the firm prior to disclosure. The level of constraint is measured using KZ Index (Kaplan and Zingales 1995). Firm is financially constrained if its KZ index is above median. Complexity is based on the treatment firms of the SFAS 133 regulation.

	(1) High Financial Constraint	(2) Low Financial Constraint
VARIABLES	ΔlnSGA	ΔlnSGA
ΔlnSale	0.7664***	0.6251***
	(0.036)	(0.051)
ΔlnSale x DEC	-0.2594	-0.1874
	(0.190)	(0.120)
Event	0.0442**	0.0326
	(0.019)	(0.023)
ΔlnSale x Event	-0.1248*	-0.0238
	(0.068)	(0.102)
DEC x Event	-0.0149	-0.0206
	(0.022)	(0.028)
ΔlnSale x DEC x Event	**0.5609****	**0.3123**
	(0.243)	**(0.293)**
ΔlnSale x DEC x Post	-0.1300	-0.2423*
	(0.211)	(0.134)
ΔlnSale x DEC x Treat	-0.2098	-0.1749
	(0.189)	(0.252)
Treat	-0.0180	0.0022
	(0.012)	(0.016)
Post	-0.0323***	-0.0619***
	(0.011)	(0.015)
Observations	1,178	1,679
R-squared	0.494	0.536
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Table 7: Impact of Disclosure Complexity on Cost Stickiness - High versus Low Analyst Forecast Error (AFE)

Panel A: OLS with Fixed Effects

This test presents the impact of complexity on cost stickiness based on variation in information environment based on analyst forecast error in period prior to issuance of complex disclosure. Low (high) error is the bottom (top) quartile of mean analyst forecast error of firm performance. Complexity is measured using 10K Bog Index. The regression executed is specified below and fixed effects along with clustering at Industry-Year level is employed.

$$\Delta\ln SGA_{i,t} = \beta_0 + \gamma_0 \Delta\ln Sales_{i,t} + \gamma_1 Highcomplex_{i,t-1} + \gamma_2 X (\Delta\ln Sales_{i,t} X DEC_{i,t}) + \gamma_3 X (Highcomplex_{i,t-1} \times \Delta\ln Sales_{i,t}) + \gamma_4 X (Highcomplex_{i,t-1} X \Delta\ln Sales_{i,t} X DEC_{i,t}) + \gamma_5 Controls + \gamma_6 Interactions + \gamma_7 Industry\ Dummies + \gamma_8 Year\ Dummies + \epsilon_{i,t}$$

	(1)	(2)
	High AFE_{t-1}	Low AFE_{t-1}
VARIABLES	ΔlnSGA	ΔlnSGA
ΔlnSale	1.0091***	0.9664***
	(9.1643)	(11.3903)
$HighComplex_{t-1}$	-0.0032	-0.0031
	(-0.9021)	(-0.9272)
ΔlnSale x DEC	-0.6528***	-0.2463
	(-3.2080)	(-1.1520)
ΔlnSale x $HighComplex_{t-1}$	-0.0134	0.0007
	(-0.5762)	(0.0314)
$HighComplex_{t-1}$ x ΔlnSale x DEC	**0.0938****	**0.0325**
	(2.3018)	(0.6807)
Control Variables *x* Δ*lnSale x DEC*	YES	YES
Control Variables *x* Δ*lnSale*	YES	YES
Control Variables (Main Effects)	YES	YES
Observations	12,772	12,761
R-squared	0.512	0.530
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Panel B: Quasi Natural Experiment

This test presents the impact of complexity on cost stickiness based on variation in information environment based on analyst forecast error in period prior to issuance of complex disclosure. Low (high) error is the bottom (top) quartile of mean analyst forecast error of firm performance. Complexity is high for treatment firms in the post period of SFAS 133 regulation.

	(1)	(2)
	High AFE_{t-1}	Low AFE_{t-1}
VARIABLES	ΔlnSGA	ΔlnSGA
ΔlnSale	0.6445***	0.7353***
	(0.073)	(0.026)
ΔlnSale x DEC	-0.1133	-0.3268**
	(0.097)	(0.155)
Event	0.0317	0.0324**
	(0.037)	(0.014)
ΔlnSale x Event	-0.0313	-0.0850
	(0.090)	(0.058)
DEC x Event	-0.0141	-0.0147
	(0.032)	(0.021)
ΔlnSale x DEC x Event	**0.4812****	**0.3836**
	(0.180)	**(0.265)**
ΔlnSale x DEC x Post	-0.1366	-0.2317
	(0.075)	(0.174)
ΔlnSale x DEC x Treat	-0.2719*	-0.0735
	(0.118)	(0.198)
Treat	0.0015	-0.0099
	(0.026)	(0.009)
Post	-0.0552***	-0.0403***
	(0.013)	(0.010)
Observations	1,051	1,806
R-squared	0.494	0.536
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes