The Tone of Management Forward-Looking Statements and Asymmetric Cost Behavior

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Abstract

This study examines the effect of management expectations on cost asymmetry, and, principally, the tension between these expectations and two other economic drivers of the cost asymmetry—resource adjustment costs and the initial availability of unutilized resources. Using the tone in the forward-looking statements (FLS) of a sample of 10-K reports as a measure of management expectations, we document a positive and significant relation between the favorableness of management FLS tone and the degree of cost stickiness. Furthermore, we demonstrate that managers’ expectation-driven decisions can reverse the previously documented anti-sticky cost behavior associated with a high degree of unutilized resources. Notably, we find the impact of management expectations on the degree of cost asymmetry is strongest when both the degree of unutilized resources and the magnitude of the adjustment costs are high. Conversely, when both the magnitude of the adjustment costs and the degree of unutilized resources are low, management expectations have no impact on the degree of cost asymmetry. Our combined evidence supports the theoretical explanation in the literature that management expectations influence their resource allocation decisions, and indicates that other economic determinants need to be considered when assessing the impact of these decisions on a firm’s cost structure.
1. **Introduction**

Ever since the influential work of Anderson, Banker and Janakiraman (ABJ) (2003), researchers have sought to understand the drivers of asymmetric cost behavior (costs are said to behave asymmetrically when their response to an increase versus a decrease in demand is of a different magnitude). These researchers conjectured that management expectations of future demand drive their decisions to adjust resources asymmetrically in response to changes in current demand. They further asserts that these expectation-based decisions are constrained by two other economic drivers of the cost asymmetry—(1) the cost of adjusting resources in response to changes in demand, and (2) the availability of unutilized resources carried over the current period.

Empirically, a handful of prior studies rely on historical realizations of certain financial variables to proxy for management expectations and provide evidence consistent with the role of expectations in managers’ asymmetric resource adjustment decisions. Little is known, however, about the individual and incremental role of expectations in managers’ asymmetric resource adjustment decisions vis-a-vis constraints imposed on these decisions by the cost of adjusting resources and the availability of unutilized resources carried over the current period.

The objective of this study is to fill this void in the literature by examining the effect of management expectations on cost asymmetry, and, principally, the tension between expectation-based resource adjustment decisions and constraints imposed on these decisions by the availability

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1 The current and future cost of adjusting resources (e.g., severance payments, training costs, and installation costs of new equipment) in response to changes in demand, and the availability of unutilized resources carried over the current period have been shown to determine the sign of the cost asymmetry and to exacerbate or moderate asymmetric cost behavior (e.g., Noreen and Soderstrom, 1997; Balakrishnan et al., 2004; Banker et al., 2013; Cannon, 2014). See Banker and Byzalov (2014) for a review of this literature.

2 These studies document an association between asymmetric cost behavior and prior period revenue decrease and the change in gross national product (ABJ), CEO’s option exercising behavior (a measure of managerial overconfidence) (Chen, Gores, and Nasev, 2013), the 2008-2009 economic downturn (Banker, Fang, and Mehta, 2013), and the changes in prior sales, gross domestic product and order backlog (Banker, Byzalov, Ciftci, and Mashruwala, 2014).
of unutilized resources and the cost of adjusting resources. This analysis is important because it promotes our understanding of a firm’s cost structure, which, in turn, affects earnings. Moreover, identifying and understanding the building blocks of the sign and magnitude of cost asymmetry may benefit future research, since prior studies show that the sign and magnitude of cost asymmetry affects a variety of financial variables such as analyst forecasts, modeling future earnings, conservatism, credit risk, and accounting fundamentals, which are of interest to internal and external financial statement users (e.g., Banker and Chen, 2006; Weiss, 2010; Homburg, Nasev, Reimer, and Uhrig-Homburg, 2016).

To identify management expectations, we construct a measure based on the tone of management’s forward-looking statements (FLS) in the Management Discussion and Analysis section (MD&A) of 10-K reports. Forward-looking statements are available for a large cross-section of firms and have been shown by numerous prior studies to predict both current and future firm performance (e.g., Li, 2010a, 2010b; Wang and Hussainey, 2013). Using the tone of management FLS to proxy for their own expectations is particularly appropriate in our setting because it varies both across firms and over time, has been thoroughly validated by numerous studies as a robust measure of management expectations, and explicitly relies on direct, self-reported statements made by managers regarding their own expectations of the firms’ prospects.3

We begin our analysis by documenting that a favorable tone in a firm’s FLS is positively and significantly associated with cost changes related to sales increases and negatively and

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3 These properties differentiate our measure of management expectations from those used in prior studies that rely on historical realizations of certain variables (e.g., change in GDP, order backlog, and change in prior sales) to capture management expectations. Furthermore, using GDP to proxy for management expectations cannot capture the variation in these expectations across firms, using order backlog captures only one dimension of managerial expectations and results in a significant loss of data, and, as discussed in Banker and Byzalov (2014) and Banker et al. (2014) and elaborated below, change in prior sales likely captures both the amount of unutilized resources and managerial expectations. We demonstrate the incremental explanatory power of the tone of management FLS over and above measures used in prior studies.
significantly associated with cost changes related to sales decreases. That is, as expectations become more optimistic, managers increase costs to a greater extent when sales rise and decrease costs by a lesser extent when sales fall (ABJ termed this behavior as *sticky cost*). This finding establishes a positive and significant relation between the favorableness of management FLS tone and the degree of cost stickiness, provides a further validation of our measure of management expectations, and confirms evidence in prior literature.

Our main analysis focuses on the tension between management expectation-driven resource adjustment decisions and the constraints imposed on these decisions by the degree of unutilized resources carried over into the current period. Prior research has found that having fewer unutilized resources at the beginning of a period (measured as an increase in prior sales) results in sticky cost behavior, whereas a greater degree of unutilized resources (measured as a decrease in prior sales) leads to *anti-sticky cost* behavior.\(^4\) Similarly, in our study, we find a positive and significant relation between our measure of management expectations and the degree of cost stickiness when there are fewer unutilized resources. However, we extend previous findings by documenting that when the degree of unutilized resources is high, negative managerial expectations result in anti-sticky cost behavior, whereas positive expectations result in sticky cost behavior. This finding is consistent with our hypotheses and demonstrates that expectation-driven decisions, not only attenuate, but actually reverse the previously documented anti-sticky cost behavior associated with a high degree of unutilized resources. It thus underscores the important role manager decisions play in shaping a firm’s cost structure.

One assumption underlying predictions regarding asymmetric cost behavior is that the costs of adjusting resources in response to changes in demand are non-negligible. If adjustment

\(^{4}\) Costs are termed as anti-sticky when they increase less when current sales rise than they decrease when current sales fall by an equivalent amount (see, for example, Kama and Weiss, 2013; Banker et al., 2014).
costs were negligible (e.g., adjustment costs of direct materials), then costs would be variable and management should exhibit a symmetric response to rises and falls in demand. Furthermore, negligible costs would mean that management expectations should have little to no impact on cost behavior because there are no current or future adjustment costs that managers need to consider when making resource allocation decisions. By contrast, if adjustment costs are non-negligible, management expectations should play a more significant role in their resource allocation decisions as these decisions impact both current and future adjustment costs. In addition, since managers’ discretion in making resource allocation decisions is increasing in the degree of unutilized resources, management expectations should play a more significant role when the degree of these unutilized resources is higher.5

Following this discussion, we examine whether the impact of management expectations on cost asymmetry varies based on the magnitude of adjustment costs, as well as the degree of unutilized resources available at the beginning of the period. Using asset intensity as a measure of the magnitude of adjustment costs (e.g., Chen et al., 2012, Banker et al., 2013), we predict and find that the impact of management expectations on the degree of cost asymmetry is strongest when both the magnitude of adjustment costs and the degree of unutilized resources are high. Conversely, when the magnitude of adjustment costs and the degree of unutilized resources are both low, we find that management expectations have no impact on the degree of cost asymmetry. These results are new to the literature and indicate that expectations should matter most for those managers who are concerned about the costs of resource adjustment and who have flexibility due to a greater degree of unutilized resources. By contrast, expectations should be less relevant in

5 When the degree of unutilized resources available at the beginning of the period is high, managers may use these resources in responding to an increase in sales, reducing the need to acquire additional resources. Conversely, when managers begin the current period with a low degree of unutilized resources, they have less discretion, and thus will need to increase resources almost proportionally in the current period in response to an increase in demand.
decision-making when the cost of adjusting resources is low and managers have fewer unutilized resources. Together, this evidence supports one of the main inferences of this study that the impact of management expectations on resource allocation decisions is contextual.

In our final analysis, we examine the combined effect of management expectations, the degree of unutilized resources, and adjustment costs on the overall sign and magnitude of the cost asymmetry. We find the strongest cost stickiness occurs when there is a low degree of unutilized resources, a high magnitude of adjustment costs, and management has positive expectations about the future. In contrast, we find the strongest cost anti-stickiness occurs when all three drivers operate in the opposite direction. Again, these findings are new to the literature and validate the individual and incremental roles of each driver in determining firms’ cost structure.

This study provides several contributions to the existing literature. First, we provide a direct empirical evidence for the role of management expectations in shaping the cost asymmetry. This evidence supports the prevailing theoretical argument in the literature that management expectations motivate them to make decisions that impact the firms’ cost structure. Notably, our empirical evidence should not be confused with prior evidence on the moderating effect of prior sales changes on asymmetric cost behavior in Banker et al. (2014), who find that when prior sales fall (rise), costs are on average anti-sticky (sticky) in the current period. As discussed in Banker at al. (2014) and Banker and Byzalov (2014), this prior evidence reflects the combined effect of both the degree of unutilized resources available at the beginning of the period and management expectations on the cost asymmetry.6 Disentangling and separately analyzing the distinct and

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6 Using a single measure to capture the combined effect of both the degree of initial unutilized resources and management expectations can only shed light on a subset of possible cases in which a high degree of initial unutilized resources (prior sales decrease) is accompanied by management pessimism, or a low degree of initial unutilized resources (prior sales increase) is accompanied by management optimism.
incremental effects of unutilized resources and management expectations on the cost asymmetry allows us to examine the existence and magnitude of the cost asymmetry for all possible cases including when a high degree of initial unutilized resources (prior sales decrease) is accompanied by management optimism (FLS tone is positive), and when a low degree of initial unutilized resources (prior sales increase) is accompanied by management pessimism (FLS tone is negative). This is important because the latter two cases, which account for 58% of the total number of observations in our sample, capture circumstances in which the two economic drivers of cost asymmetry operate in an opposite direction, and thus provide a more explicit identification of the role of each driver.7

Our second contribution stems from the evidence that the sign of the cost asymmetry (i.e., sticky or anti-sticky) depends on whether management expectations are positive or negative, after controlling for a high degree of initial unutilized resources, because this evidence is new to the literature and highlights the importance of management expectations in shaping the sign of cost asymmetry.

Third, our evidence on both the incremental and the combined effects of management expectations, the degree of unutilized resources, and adjustment costs on the sign and magnitude of cost asymmetry lends insight to the question of how cost asymmetry arises. Specifically, this study is the first to provide empirical evidence that cost anti-stickiness arises only when both the initial amount of unutilized resources is high and management expectations are negative. Having

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7 Prior sales change and FLS Tone likely capture two distinct drivers of cost asymmetry: the degree of unutilized resources and managerial expectations, respectively. This statement is supported by the relatively low correlation between prior sales decrease and our measure of FLS tone of -0.09 and by our systematic findings of the individual and incremental role of each driver in determining firms’ cost structure. While it is possible that prior sales change captures some aspects of management expectations even after including the tone of management FLS, our evidence that both measures are incrementally significant supports the ability of prior changes in sales to proxy for the amount of unutilized resources.
only one of these economic elements is not sufficient to result in cost anti-stickiness. Furthermore, we provide evidence that the impact of management expectations on the sign and magnitude of cost asymmetry depends on both the degree of unutilized resources and the magnitude of the adjustment costs. This evidence enriches our understanding in how the sign of cost asymmetry arises, and indicates that other economic determinants need to be considered when assessing the relevance of deliberate resource allocation decisions.

Finally, we contribute to the emerging body of literature that integrates managerial and financial research topics (e.g., Banker and Chen, 2006; Weiss, 2010; Chen et al., 2012; Dierynck et al., 2012; Kama and Weiss, 2013; Holzhacker et al., 2015; Banker et al., 2016) by examining the relation between management FLS tone in corporate financial reports and internal resource allocation decisions, and by introducing textual analysis into managerial accounting research.

Section 2 develops our hypotheses. We describe the sample and our variable definitions in Section 3. Section 4 describes our empirical results. Section 5 concludes the paper.

2. Hypotheses Development

2.1 The impact of management expectations on the degree of cost asymmetry

Prior studies on cost asymmetry are based on the idea that this asymmetry is driven by managerial expectations of future demand. This argument relies on the notion that any increase in demand requires management to decide whether and by how much to increase resources. The decision of whether to increase resources depends on both the cost of doing so as well as whether
management expects high demand to continue.\textsuperscript{8} When managers expect future demand to remain high, they are willing to bear the adjustment costs because the greater resources are likely to be needed in the future as well. Accordingly, when sales rise, managers with positive expectations are likely to increase resources more aggressively.

By contrast, when current demand falls, managers must decide whether to cut unutilized resources. Again, this decision depends on both the costs of doing so as well as whether management expects low demand to continue. When managers expect demand to bounce back in the future, they are likely to cut unutilized resources by a lower amount, thereby reducing both current and future adjustment costs.\textsuperscript{9} Thus, managers with positive expectations should hold downward their resource adjustments and speed up their upward resource adjustments, resulting in a higher degree of cost stickiness. Accordingly, we begin our analysis by testing the following prediction:

\textbf{H1: The degree of cost stickiness is increasing in the positiveness of management expectations}

We note that, while this prediction has been raised in prior studies, it has not been tested with a direct measure of management expectations. Therefore, our tests of this prediction add to this literature and provide validation of our empirical measure of management expectations.

\textsuperscript{8} The traditional view that variable and fixed costs mechanistically determine the relation between costs and activity level implies that adjustment costs are either zero or infinite (Balakrishnan et al., 2014). The revised view in the asymmetric cost behavior literature is based on the notion that the drivers of cost behavior are the costs of adjusting resources and management deliberate resource allocation decisions. Under this view, significant, but not infinite, adjustment costs would result in an asymmetric cost behavior (e.g., Banker and Byzlov, 2014).

\textsuperscript{9} The relative impact of management expectations on costs is likely to be stronger when demand rises than when demand falls. When demand falls and managers cut unutilized resources, the cost savings resulting from the reduction in resources is partly offset by the adjustment costs, such as disposal costs of existing equipment. However, when demand rises, increasing resources results in adjustment costs such as installation costs of new equipment which in turn intensify the increase in total costs.
2.2 The impact of management expectations on cost asymmetry in the presence of constraints imposed by the degree of unutilized resources

Another important driver of the observed variation in cost asymmetry is the degree of unutilized resources carried over into the current period (e.g., Balakrishnan et al., 2004; Cannon, 2014). Accordingly, we consider the tension between the impact of management expectations and the degree of unutilized resources carried over into the current period on the variation in cost asymmetry.

High degree of unutilized resources

A high degree of unutilized resources enables managers to use these resources in responding to an increase in sales, thereby reducing the need to acquire additional resources. However, when current sales decline, the combination of the existing and the newly created unutilized resources may exceed acceptability thresholds, causing managers to reduce these resources. Accordingly, managers with a higher degree of unutilized resources would adjust resources more quickly when sales fall than when sales rise. While these actions have been shown by prior literature to be on average associated with anti-sticky cost behavior (e.g., Balakrishnan et al., 2004; Banker et al., 2014), the literature did not examine the distinct and incremental impact of management expectations on these actions.

Cost anti-stickiness associated with a high degree of unutilized resources should be greater for managers whose future demand expectations are bleak. When demand increases, such managers will be less willing to incur adjustment costs associated with additional resources they do not anticipate using in the future. They will also be more aggressive in cutting down unutilized resources when demand falls. These managers differ in their decisions from those whose
expectations are positive. Managers with positive expectations will assume that they can use unutilized resources in the future and will thus be less likely to make aggressive cuts of unutilized resources when demand falls and more likely to increase resources beyond the available amount when current demand rises. These decisions will reduce the extent of any anti-stickiness and may even induce sticky behavior, even when the degree of unutilized resource is high. Accordingly, we predict that:

**H2a: Management positive expectations diminish the anti-sticky costs imposed by a high degree of unutilized resources**

**Low degree of unutilized resources**

We next consider the case when managers are faced with a low degree of unutilized resources carried over into the current period. These managers will need to increase resources almost proportionally when demand increases, but can better afford to retain unutilized resources when demand falls. As a result, when the degree of unutilized resources is low, managers should exhibit slower resource adjustments when demand falls than when demand rises, thereby intensifying the extent of cost stickiness (e.g., Anderson et al., 2007; Cannon, 2014).

We predict that management expectations will impact their resource allocation decisions when the degree of unutilized resources is low. Specifically, when managers have positive future demand expectations we expect that the degree of cost stickiness will intensify. Managers with positive expectations will assume that they can use unutilized resources in the future and will thus be less likely to cut unutilized resources when demand falls and are likely to increase resources more aggressively when current demand rises. In contrast, managers with negative expectations should be more likely to accelerate cost savings when activity levels fall and refrain from adding
resources when activity levels rise. The former is likely to intensify the degree of cost stickiness, whereas the latter should reduce the degree of cost stickiness (and may induce anti-stickiness). Accordingly, we predict that:

\[ H2b: \text{Management positive expectations intensify the cost stickiness associated with a low degree of unutilized resources} \]

### 2.3 When do management expectations matter the most?

In our study, we assume that the costs of adjusting resources in response to a change in demand are non-negligible. Based on this assumption, we predict that management expectations should play a more significant role in their resource allocation decisions when adjustment costs are non-negligible.\(^\text{10}\) We also predict that management expectations should play a more significant role when the degree of unutilized resources is high. For example, if demand increases, a manager with a high degree of unutilized resources should rely more on her expectations to determine if resources beyond those available are necessary. By contrast, a manager with low degree of unutilized resources has less discretion in making resource allocation decisions, and therefore will not need to rely as heavily on her expectations of future demand.\(^\text{11}\) Taken together, we predict that when adjustment costs are high, management expectations are most relevant in making resource allocation decisions; these decisions, in turn, are most influential in determining the cost

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\(^{10}\) As mentioned above, if adjustment costs were fully negligible, then management would exhibit a symmetric response to rises and falls in demand. Furthermore, negligible costs would mean that management expectations should have little to no impact on cost behavior because there are no current or future adjustment costs that managers need to consider when making resource allocation decisions.

\(^{11}\) At the extreme, when the degree of unutilized resources is insignificant and current demand rises, a manager cannot rely on unutilized resources, and would thus need to meet current demand by acquiring additional resources, regardless of her expectations.
asymmetry when the degree of unutilized resources is high. Combining this argument with the discussion in sections 2.1 and 2.2, we hypothesize that:

\[H3: \text{The impact of management expectations on the degree of cost asymmetry is the strongest (weakest) when both the magnitude of adjustment costs and the degree of unutilized resources are high (low).}\]

The hypotheses above further suggest that the highest degree of cost stickiness (anti-stickiness) should be observed when management positive (negative) expectations are accompanied by a low (high) degree of unutilized resources and a high (low) magnitude of adjustment costs. In our subsequent analyses, we empirically test these relations.

3. Sample, Variables, and Descriptive Statistics

3.1 Sample selection

We obtain our initial sample from the set of all public firms covered by Compustat from 1994-2014. From this sample, we exclude financial institutions and public utilities (firms with four-digit SIC codes 6000-6999 and 4900-4999) because these firms and their financial reporting requirements are subject to industry-specific regulations. We estimate the yearly inflation rates for our sample using monthly inflation data from CRSP U.S. Treasury and Inflation and use these rates to adjust the dollar amounts of our variables for inflation.

After identifying our initial sample, we merge this sample with all 10-K and 10-K405 (hereafter 10-K) filings covered by the SEC EDGAR online filings website from 1994 to 2014.\(^\text{12}\)

\(^{12}\) The SEC mandate for U.S. public companies to file through the EDGAR online system began in 1994.
From this newly-merged sample, we delete any observations with missing data for our estimated variables, as well as any observations with non-positive values for sales revenue, SG&A expenses, or total assets. Following prior studies, we also exclude any firm-year observations with an SG&A expenses-to-sales ratio greater than one. Finally, to limit the effect of extreme observations, we rank the firms in our sample according to each of the estimated variables in the regression models by year, and remove the extreme 1% of the observations on each side. Our final sample includes 45,048 firm-year observations. Table 1 provides the details of our sample selection procedure.

3.2 Measuring management expectations

To measure the favorableness of management expectations, we identify the tone exhibited in their forward-looking statements (FLS) included in the Management Discussion and Analysis section (MD&A) of the 10-K reports.13 Prior studies have shown that FLS provide a comprehensive view of management expectations regarding various aspects of the business that ultimately impact future sales. In addition to explicit statements related to sales, these aspects include statements related to consumer demand, market conditions, competition, liquidity, production, income, pricing, investments, all of which may directly or indirectly impact future

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13 While management earnings guidance (EG) can also be used as a measure of management expectations, there are several limitations associated with this measure: (1) Issuing EG is not a pervasive practice. For example, Hamm et al. (2015) document that during 1997-2012 less than 23% of their sample issue EG (see also Ball and Shivakumar, 2008; Beyer et al., 2010; Rogers and Van Buskirk, 2013). (2) Prior literature (e.g., Houston et al., 2010; Chen et al., 2011) has documented that firms that stop providing EG have poorer prior performance, more uncertain operating environments, and fewer informed investors; accordingly, using EG might lead to a biased sample. (3) Managers may use their guidance to manage analysts’ earnings expectations (e.g., Cotter et al., 2006; Koh et al., 2008; Kim and Park, 2012; Ciconte et al., 2014). (4) EG is a quantitative, short term, and is provided at the aggregate level with no reference to the components of earnings.
sales (See Li, 2010a for a complete classification of FLS statements).\textsuperscript{14,15}

We extract the MD&A section of each 10-K filing using Perl. The forward-looking statements in each MD&A are then identified using a similar dictionary-based approach used in prior research (Li 2010a, Bozanic et al. 2015). Specifically, we identify an FLS as any sentence in the MD&A which contains one or more forward-looking words and does not contain any word or sequence of words which suggest that the sentence pertains to the past or is legal boilerplate. The primary purpose of the past exclusion restriction is to eliminate sentences about prior forward-looking statements which may not be indicative of management’s current expectations of the future. Our dictionaries of Forward-Looking Words, Exclusion N-Grams, and Legal Exclusion Words were constructed using the dictionaries used in Li (2010a) and Bozanic et al. (2015).

We calculate the tone of each FLS as the difference between the number of positive and negative words divided by one, plus the sum of the number of positive and negative words. Following prior studies (e.g., Gurun and Butler, 2012; Mayew and Venkatachalam, 2012; Huang et al., 2014) the numbers of positive and negative words are measured using the financial tone dictionaries provided by Loughran and Mcdonald (2011):\textsuperscript{16}

\[
Tone_{i,t} = \frac{Positive\ Words_{i,t} - Negative\ Words_{i,t}}{(1 + Positive\ Words_{i,t} + Negative\ Words_{i,t})}
\]

\textsuperscript{14} Further validation for the ability of FLS to capture future events is provided in Muslu et al. (2015) who find that firms with poor information environments provide a greater quantity of FLS in their MD&As that investors find useful in predicting future earnings; and, Bozanic et al. (2015) find evidence that suggests that the forward-looking statements in MD&A are positively associated with both market reactions and changes in analyst forecast accuracy.

\textsuperscript{15} In a robustness test, we re-run our main tests based on a measure of tone of FLS that contains words that more explicitly relate to demand (e.g., “sales,” “revenues,” “pricing”). Our results remain similar to those reported using the tone of the entire set of FLS.

\textsuperscript{16} For the lists of positive and negative words see \url{http://www3.nd.edu/~mcdonald/Word_Lists.html}. The use of the Loughran and Mcdonald (2011) word lists is pervasive in the literature. These lists are based on the word usage in a large sample of 10-K reports, which makes them particularly appropriate in the context of our study. As noted in Loughran and Mcdonald (2016), applying other dictionaries (such as, Henry, 2008; Harvard’s GI; Diction) that are based on other financial disclosures (e.g., earnings press releases, conference calls) to 10-K reports can produce spurious results.
Since it is possible that management's expectations for year $t$ might affect the tone of FLS included in the MD&A for both the end of year $t-1$ and the end of year $t$, we calculate the average tone for firm $i$ in year $t$; \( \text{average Tone}_{i,t} = (\text{Tone}_{i,t-1} + \text{Tone}_{i,t})/2 \). After obtaining the average Tone, we use a scaled-quintile format to rank all observations according to the value of the average Tone and assign each observation to a quintile. We then transform our tone variable into a scaled-quintile variable with values ranging from zero to one, following the procedure in Rajgopal et al. (2003) and Amir et al. (2015): “0” in the bottom quintile, “0.25” in the second quintile, “0.50” in the third quintile, “0.75” in the fourth quintile, and “1” in the highest quintile. We denote this scaled-quintile measure of management expectations as $\text{EXP}$.\(^{18}\)

Using the tone of FLS to measure the favorableness of management expectations is motivated by recent research examining the relation between management tone in FLS and firms’ current and future performance. For example, examining the information content of FLS, Li (2010a, 2010b) finds that the tone of forward-looking statements is positively associated with a firm’s future performance, consistent with the idea that FLS provide forward-looking information about the company.\(^{19}\) Davis and Tama-Sweet (2012) find that higher levels of pessimistic tone in the MD&A section of 10-K reports are related with lower future return on assets, while Feldman et al. (2010) find that immediate stock price response is positively associated with changes in MD&A tone. A related literature further validates the ability of tone to capture management view of the prospects of their business by demonstrating that tone provides a robust measure of the

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\(^{17}\) We repeat the analysis using the tone at either the beginning or the end of the year (instead of an average) and the lagged values of average tone, obtaining similar results. Additionally, results using the abnormal tone measure developed by Huang et al. (2014) in the context of earnings press releases are qualitatively the same. As discussed in Davis and Tama-Sweet (2012), earnings press releases are subjected to fewer regulations compared to MD&A and thus more likely to be used strategically.

\(^{18}\) Approximately 54% of firm-year observations in out sample change their quintile ranking from year $t-1$ to year $t$.

\(^{19}\) This finding suggests that management expectations, as reflected in the FLS Tone, are on average, unbiased. However, even if these expectations are partially based on psychological bias (in addition to available information), all of our hypotheses and inferences will remain the same (see Banker et al., 2014, footnote 17).
information content of other disclosures (e.g., earnings release, newspaper articles, and various regulatory filings). For example, Tetlock (2007) finds pessimistic tone in the Wall Street Journal’s “Abreast of the Market” column is associated with lower subsequent stock returns and higher stock market volatility even when the column does not provide new fundamental information about the stock. Tetlock et al. (2008) document a greater frequency of negative words in the Wall Street Journal and Dow Jones News Service stories is associated with lower subsequent earnings. Similarly, Kothari et al. (2009) provide evidence that positive tone of disclosures by the firm, analysts, or the media is negatively related with volatility and forecast dispersion. Davis et al. (2012) find that managers use both optimistic and pessimistic tone in their earnings press releases as a way to provide investors with information about expected future performance of their firms. Finally, Price et al. (2012) find the extent of positive tone in the Q&A portion of the conference call is associated with a positive return in a three-day and two-month windows.20

Overall, an overwhelming number of studies that employs word lists to capture management tone in a large variety of research contexts provide ample validation for the ability of these word lists and their associated tone measures to explain and, more importantly, predict various economic outcomes. The tone measure is firm-specific, time-varying, captures multiple aspects of the business, and, most importantly, is extracted directly from statements managers provide regarding their own expectations of future business outcomes. Accordingly, we believe our empirical measure of management expectations provides an explicit identification of the role of these expectations in determining the sign and magnitude of cost asymmetry, distinctly from

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20 As discussed in the comprehensive reviews of this nascent literature by Li (2010b) and Loughran and McDonald (2016), many additional studies have used word-lists to gauge tone in a variety of other contexts.
and incrementally to the degree of unutilized resources.\textsuperscript{21} As discussed above, this claim is further supported by the relatively low correlation between prior sales decrease and our measure of FLS tone of -0.09. As an additional supportive evidence of the distinct nature of the FLS tone relative to prior sales change, we report in panel B of Table 2 the frequency of observations by the sign of prior sales change and quintiles of FLS Tone. The results indicate that the frequency of observations associated with the lowest (most negative) tone quintile and increase in prior sales is 18%, and those associated with the highest (most positive) tone quintile and decrease in prior sales is 16% (these are the two cases that cannot be captured by the measure used in Banker et al. 2014). These frequencies are close to the expected frequency of 20%, and, importantly, are significantly and economically greater than zero, which is the frequency expected if prior sales changes capture completely management expectations. These statistics combined with the empirical findings reported below supports the distinct and incremental nature of FLS tone relative to prior sales change used by Banker et al. (2014) as a combined measure of the degree of unutilized resources and managerial expectations.

3.3 Variable definitions

The dependent variable in our regression models is the log change of SG&A expenses (SGA) for firm \( i \) in year \( t \) (\( \Delta \ln \text{SGA}_{i,t} \)); \( \Delta \ln \text{SGA}_{i,t} = \log (\text{SGA}_{i,t} / \text{SGA}_{i,t-1}) \). Consistent with the literature we focus on SGA to capture managerial choices affecting the costs of providing services, marketing and distribution, and other administrative overhead costs. Other key variables are sales revenue (REV), the log change of sales revenue [\( \Delta \ln \text{REV}_{i,t} = \log (\text{REV}_{i,t} / \text{REV}_{i,t-1}) \)], and an

\textsuperscript{21} Unlike prior sales change used in Banker et al. (2014) to empirically proxy for the combined effect of the degree of unutilized resources and management expectations,
indicator variable that equals 1 if $\text{REV}_{it} < \text{REV}_{i,t-1}$ and 0 otherwise ($\text{REVDEC}_{it}$). Following previous studies (e.g., Banker et al., 2014), we use prior sales change to measure the degree of unutilized resources available at the beginning of the period. Specifically, if managers faced a sales increase in the past, they may have drawn on unutilized resources to meet demand, leading to a lower degree of unutilized resources available for the current period. We define $\text{LowUnutilizedResources}_{i,t}$ as an indicator variable that equals 1 if $\text{REV}_i$ in year $t-1$ is higher than in year $t-2$ and 0 otherwise.\(^{22}\) This measure builds on the notion that when prior sales have risen, managers are more likely to have exhausted existing resources, resulting in lower amount of unutilized resources at the beginning of the current period relative to when prior sales decreases. Conversely, when prior sales decreases, managers likely retained some of the resources resulting in a greater amount of unutilized resources carried over into the current period, relative to when prior sales increase (e.g., Cannon, 2014).\(^{23}\)

Finally, previous studies argue that adjustment costs are higher for firms whose sales require a higher amount of assets, as there is lower flexibility in changing the amount of assets.\(^{24}\) Consequently, we use asset intensity, measured as the log of the ratio of total assets to sales

\(^{22}\) By including in our regressions prior change in sales and the tone of FLS as proxies for the degree of unutilized resources and management expectations, respectively, we are able to assess the incremental and distinct effect of each driver on the cost asymmetry while controlling for the effect of the other driver.

\(^{23}\) As robustness, we estimated our main regressions using two alternative measures of unutilized resources. The first one defines observations as a high degree of unutilized resources when $\text{REV}$ in year $t-1$ is lower than in year $t-2$ and the change in the prior SG&A (i.e., $\text{SGA}_{t-1}/\text{SGA}_{t-2}$) is greater than or equal to the change in prior sales (i.e., $\text{REV}_{t-1}/\text{REV}_{t-2}$), and a low degree of unutilized resources otherwise. The second one defines observations as a high degree of unutilized resources when $\text{REV}$ in year $t-1$ is lower than in year $t-2$ and the prior change in the number of employees is greater than or equal to the change in prior sales, and a low degree of unutilized resources otherwise. While not common in the literature, these measures might be able to better identify firm-year observations associated with a high degree of unutilized resources at the beginning of the period as those that experienced a decrease in sales that was not accompanied by a proportional decrease in capacity. Results using these alternative measures remain similar to those reported in tables 4-6.

\(^{24}\) Some studies use employee intensity as an additional measure of adjustment costs. However, Kama and Weiss (2013) indicate that the coefficient estimate of employee intensity is insignificant for large firms. Furthermore, Chen et al. (2012) show that the sign and significance level of employee intensity is not stable over time, presumably due to the use of temporary labor to a greater extent in recent years. Our results are statistically indistinguishable when we add employee intensity as an additional control variable.
revenues, to determine adjustment costs, \( ASINT_{it} = \log (\text{Assets}_{it} / \text{REV}_{it}) \).

### 3.4 Descriptive statistics

Table 2 provides the descriptive statistics for the main variables used in our analysis. Consistent with prior studies, we find that the respective distributions of REV and SGA are skewed to the right as their mean values (REV = $2,239 million; SGA = $377 million) are larger than their median values (REV = $249 million; SGA = $53 million). We also find that the ratio between SGA and REV (mean = 0.28) and the log change of both REV and SGA (mean = 0.06) are similar to those documented in prior studies. In addition, our sales decline frequency of 36% is similar to the 37% found in Banker et al. (2014). Finally, our median Tone of -0.21 is equal to that documented in Li (2010a).

### 4. Empirical Results

#### 4.1 The impact of management expectations on the degree of cost asymmetry

We test the impact of management expectations on the degree of cost asymmetry (H1) by estimating the following regression model:\(^{25}\)

\[
\Delta \ln SGA_{it} = \beta_0 + \gamma_0 \text{EXP}_{it} + \left( \beta_1 + \gamma_1 \text{EXP}_{it} \right) \Delta \ln \text{REV}_{it} + \left( \beta_2 + \gamma_2 \text{EXP}_{it} \right) \text{REVDEC}_{it} \Delta \ln \text{REV}_{it}
\]

\[
+ \delta_1 \text{ASINT}_{it} \Delta \ln \text{REV}_{it} + \varepsilon_{it} \tag{1}
\]

Table 3, Column (1) reports the results from replicating the ABJ basic model. Consistent with previous studies, we find that the coefficient estimate on \( \beta_1 \) is 0.667 and significant, while that of \( \beta_2 \) is -0.263 and significant. These results suggest that a one percent increase in sales results

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\(^{25}\) In estimating all our regression models, we cluster observations by firm and year to provide standard errors that are robust to autocorrelation and heteroscedasticity, as suggested by Petersen (2009).
in a 66.7 basis points (bps) increase in SG&A expenses, while a one percent decrease in sales results in a \((66.7 - 26.3 =) 40.4\) bps decrease in SG&A expenses. The difference between these, \(\beta_2\), captures the degree of cost stickiness.

The results in Column (2) show a negative and significant coefficient for \(\gamma_2\), the interaction between \(EXP\) and \(REVDEC*\Delta lnREV\). This coefficient indicates that when management has the most negative expectations (the lowest quintile of \(EXP\)), the degree of cost stickiness, \(\beta_2\), is -0.183, negative and significant. However, when management has the most positive expectations (the highest quintile of \(EXP\)), the degree of cost stickiness significantly intensifies by 0.167 to -0.350. This finding provides support to our prediction that the degree of cost stickiness increase in the positiveness of management expectations.

Column (3) presents the results of our analyses after controlling for the level of asset intensity (e.g., Chen et al., 2012; Banker et al., 2013). These results show that a one percent increase in current sales results in an incremental increase in SG&A expenses of 15.7 bps (\(\gamma_1\)) when managers have the most positive expectations compared to when they have the most negative expectations. Conversely, the results show that when sales fall, management expectations attenuate the reduction in expenses by 6.4 bps (\(\gamma_1 + \gamma_2 = 0.157 - 0.221 = -0.064\), significant at the 0.01 level).

To further validate the results in Table 3, we examine whether the impact of expectations on cost asymmetry is pervasive throughout its distribution. To do so, we estimate the ABJ benchmark model within our \(EXP\) quintiles and depict the coefficient estimates for \(\beta_1\) and \(\beta_2\) in Figure 1. From Figure 1, we see that both \(\beta_1\) and \(\beta_2\) are monotonically associated with management expectations. Specifically, \(\beta_1\) increases monotonically from 0.585 in the lowest \(EXP\) quintile to 0.741 in the highest \(EXP\) quintile. Furthermore, \(\beta_2\), the measure of sticky costs, decreases monotonically from -0.168 in the lowest \(EXP\) quintile to -0.339 in the highest \(EXP\) quintile. The
differences in $\beta_1$ and $\beta_2$ between these quintiles are both economically and statistically significant. The finding that $\beta_2$ is negative and significant in the most pessimistic tone quintile is inconsistent with the assertion in the literature that negative expectations might lead to cost anti-stickiness.

Overall, the evidence presented in Table 3 and Figure 1 provides an initial direct support for the role managers’ expectations play in shaping a firm’s cost structure, and a validation of our measure of management expectations.

4.2 The impact of management expectations on cost asymmetry in the presence of constraints imposed by the degree of unutilized resources

We next examine the results of estimating regression model (1) for sub-samples of high and low degrees of unutilized resources ($LowUnutilizedResources_{i,t} = 0$ or $1$, respectively). The results in Panel A of Table 4 show a negative and significant coefficient estimate for $\gamma_2$, our measure of the impact of management expectations on cost asymmetry, regardless of the degree of unutilized resources.

Using the coefficient estimates in Panel A, Panel B reports the level of cost asymmetry according to the degree of unutilized resources and management expectations. The results in Panel B indicate that the degree of cost anti-stickiness associated with a high degree of unutilized resources is 0.116 when managers have the most negative expectations. Consistent with H2a, the degree of anti-stickiness significantly diminishes by 0.233 when managers have the most positive expectations, leading to a significant cost stickiness of -0.117. Also, consistent with H2b, when the degree of unutilized resources is low, we find that the degree of cost stickiness is -0.301 when managers have the most negative expectations, intensifying to -0.447 when managers have the
most positive expectations (the mean ASINT for the subsamples of high and low degrees of unutilized resources are equal to 0.12 and 0.22, respectively).26

Overall, we conclude that the findings in Table 4 support our second hypothesis. Furthermore, they show that managers’ expectation-driven decisions can not only eliminate but also cause a reversal in the anti-sticky cost behavior imposed by a high degree of unutilized resources, again underscoring the importance of managers’ deliberate decisions in shaping a firm’s cost structure.

4.3 When do management expectations matter the most?

We next test the joint impact of the degree of unutilized resources and the magnitude of adjustment costs on the relation between management expectations and cost asymmetry (H3) by estimating the following regression model:

\[
\Delta \ln SGA_{it} = \beta_0 + \gamma_0 \ Exp_{it} + \left( \beta_1 + \gamma_1 \ Exp_{it} + \lambda_1 \ LowUnutilizedResources_{it} + \nu_1 \ Exp \cdot LowUnutilizedResources_{it} \right) \Delta \ln REV_{it} + \\
\left( \beta_2 + \gamma_2 \ Exp + \lambda_2 \ LowUnutilizedResources_{it} + \nu_2 \ Exp \cdot LowUnutilizedResources_{it} \right) REVDEC_{it} \Delta \ln REV_{it} + \\
\delta_1 ASINT_{it} \ REVDEC_{it} \Delta \ln REV_{it} + \mu_{it}.
\]

Column (1) of Table 5 reports the results of estimating this regression model for the full sample. Consistent with the results reported in Table 4, the findings in Column (1) show that the impact of management expectations on cost asymmetry is significant for both high and low degrees of unutilized resources. Specifically, the impact of management expectations on cost asymmetry

26 These results are quantitatively similar when using the two alternative measures of unutilized resources described in footnote 23.
when the degree of unutilized resources is high is $-0.227$ ($\gamma_2$), and is significantly lower by $0.107$ ($\nu_2$) when it is low.\textsuperscript{27}

Columns (2) and (3) of Table 5 present the results for our sub-samples of high and low magnitude of adjustment costs ($ASINT$ above and below the median, respectively). Consistent with H3, we find that the impact of management expectations on the degree of cost asymmetry is strongest when both the magnitude of the adjustment costs and the degree of unutilized resources are high ($\gamma_2$ in Column 2 is equal to $-0.330$, p-value < 0.01).\textsuperscript{28} However, when both the magnitude of adjustment costs and the degree of unutilized resources are low, management expectations appear to have no impact on the cost asymmetry; $\gamma_2 + \nu_2$ in Column 3 is equal to $(-0.104 + 0.076 =) -0.028$, p-value of 0.6. These results are striking and illustrate that an analysis of the role of management expectations in making resource allocation decisions should consider the effects on these decisions of other economic drivers of a firm’s cost structure.

### 4.4 The combined effect of unutilized resources, adjustment costs, and management expectations on the degree of cost asymmetry

Thus far, we documented the impact of management expectations on the cost asymmetry in the presence of unutilized resources and adjustment costs. In this subsection, we examine the combined impact of these three constructs on the overall sign and magnitude of the cost

\textsuperscript{27} The combined effect for a low degree of unutilized resources is $\gamma_2 + \nu_2 = -0.120$, significantly different from zero at the 0.01 level.

\textsuperscript{28} The value of $\gamma_2$ associated with a high magnitude of adjustment costs ($-0.330$) is significantly more negative than: (1) the value of $\gamma_2$ associated with a low magnitude of adjustment costs ($-0.104$; the difference between $-0.330$ and $-0.104$ is significant at the 0.01 level), and (2) the value of $\gamma_2 + \nu_2$ associated with high magnitude of adjustment costs; ($-0.330+0.171=) -0.159$, the difference between $-0.330$ and $-0.159$ is significant at the 0.06 level.
asymmetry. We rely on the coefficient estimates from Table 5 and report the results of this analysis in Table 6.

Table 6 shows that when the degree of unutilized resources is high, costs are either anti-sticky or sticky. Specifically, cost asymmetry ranges from a value of 0.253 (p-value < 0.01) to a value of -0.135 (p-value = 0.02). Conversely, costs are sticky when there is a low degree of unutilized resources, regardless of either adjustment costs or management expectations. Furthermore, we find the highest degree of cost anti-stickiness, 0.253, occurs when there is a high degree of unutilized resources, a low magnitude of adjustment costs, and management with negative expectations. In contrast, we find the highest cost stickiness, -0.538, occurs when all three drivers operate to intensify cost stickiness, i.e., a low degree of unutilized resources, a high magnitude of adjustment costs, and management with positive expectations. Together, the results in this table validate the individual and incremental roles of each driver in determining a firm’s cost structure.

4.5 Robustness tests

We test for the robustness of our main results by performing the following analyses (untabulated for brevity). First, we re-run our regressions using six alternative tone measures: FLS Tone above (below) the median as a measure for management with positive (negative) expectations; Positive (negative) FLS Tone as a measure for management with positive (negative) expectations; FLS Tone transformed into a scaled-decile variable; FLS tone as a continuous variable; lagged values of FLS tone; additionally, Loughran and Mcdonald (2016) raise a concern regarding the existence of negation surrounding positive or negative words which may lead to tone misclassification. In an additional analysis, we identify instances in which any of the three words
preceding positive and negative words are a negation word (e.g., “not”) and adjust the tone accordingly (4.6% percent of the sample). Second, to control for the potential effects of other economic variables on the cost asymmetry, we re-run our analyses including interactive terms between the degree of cost asymmetry (measured as REVDEC*ΔlnREV) and both the real change in Gross Domestic Product (GDP) and the log change in order backlog. Additionally, we replicate the results after controlling for the degree of financial risk (measured as whether the ratio of debt to assets is above or below the sample median). Third, our results are robust to the inclusion of the number of FLS sentences (Muslu et al., 2015), a measure of business complexity (the number of business segments), and two alternative measures of the degree of unutilized resources (see footnote 23). Fourth, Chen et al. (2012) find that the degree of cost stickiness increases for empire-building managers. We replicate our results after controlling for impact of the level of scaled free cash flow on the cost asymmetry (as in Chen et al., 2012). Fifth, we run a fully interactive model including all explanatory variables as stand-alone variables as well as all interactions between the explanatory variables (i.e., ΔlnREV, REVDEC, EXP, LowUnutilizedResources, and ASINT). Sixth, to ensure that our findings are not driven by industry-specific characteristics, we control for potential industry-specific effects using the Fama-French industry classification to identify industries for the firms in our sample. Finally, we run our regressions for manufacturing (Fama-French industry portfolio number 3 of 12) and non-manufacturing sub-samples. Our various results regarding the relation between the tone of FLS

29 We find that incremental to EXP, the degree of cost stickiness is increasing in the real change in GDP but is unrelated to the change in order backlog. Similar to prior studies, order backlog is available for only 25% of the sample. Anecdotally, Apple Inc. notes in its 2016 10-K filing that “In the Company’s experience, the actual amount of product backlog at any particular time is not a meaningful indication of its future business prospects.” And that “backlog should not be considered a reliable indicator of the Company’s ability to achieve any particular level of revenue or financial performance.”
and cost asymmetry, for all of these robustness tests, remain qualitatively similar to those reported in our main analyses.

5. Conclusion

The asymmetric cost response to changes in demand has attracted much attention over the past decade. In this study, we provide direct empirical evidence in support of the role of management expectations in shaping asymmetric cost behavior. Using FLS tone as a measure of management expectations, we find a positive and significant relation between the favorableness of management FLS tone and the degree of cost stickiness. Furthermore, we find that when the degree of unutilized resources is high, negative expectations result in anti-stickiness, whereas positive expectations lead to a sticky cost behavior. Accordingly, management expectations can reverse the anti-sticky cost behavior imposed by a high degree of unutilized resources, underscoring the importance of managers’ deliberate decisions in shaping a firm’s cost structure. We also find that the impact of management expectations on the degree of cost asymmetry is strongest when both the magnitude of adjustment costs and the degree of unutilized resources are high. Conversely, when both the magnitude of adjustment costs and the degree of unutilized resources are low, management expectations have no impact on the degree of cost asymmetry. Finally, we find the highest degree of cost stickiness occurs when there is a low degree of unutilized resources, a high magnitude of adjustment costs, and management with positive expectations. In contrast, the highest cost anti-stickiness occurs when all three drivers operate in the opposite direction.

Our results provide several implications for further study. First, our findings of differential effects of management expectations depending on the level of unutilized resources and the cost of resource adjustments suggest that other economic determinants need to be considered when
assessing the relevance of deliberate decisions in resource allocation. Second, we have examined one feature of financial reporting in our study. Future work could explore additional features of financial reporting to gain further insight into how managerial internal resource allocation decisions are made as well as the implications of those decisions for a firm’s cost structure.
REFERENCES


FIGURE 1

Management expectations and the degree of cost asymmetry

The figure presents regression results for subsamples formed based on the tone of FLS (each subsample includes, on average, 9,390 observations). First, we rank all firm-year observations according to the value of FLS tone and assign them into quintiles. Then, we estimate the following ABJ benchmark model within each quintile and depict the coefficient estimates of $\beta_1$ and $\beta_2$:

$$\Delta \ln SGA_{it} = \beta_0 + \beta_1 \Delta \ln REV_{it} + \beta_2 \Delta \ln REVDEC_{it} + \varepsilon_{it}$$
### TABLE 1

**Sample Selection**

<table>
<thead>
<tr>
<th>Description</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial sample: Firm-year observations available on Compustat, 1994 - 2014</td>
<td>238,801</td>
</tr>
<tr>
<td>Excluding financial institutions and public utilities</td>
<td>(35,524)</td>
</tr>
<tr>
<td>(1) Compustat sample</td>
<td>203,277</td>
</tr>
<tr>
<td>(2) 10-K MD&amp;A, SEC EDGAR online filing, 1994 - 2014</td>
<td>118,752</td>
</tr>
<tr>
<td>Number of observations after merging (1) and (2)</td>
<td>76,212</td>
</tr>
<tr>
<td>Excluding observations without valid data</td>
<td>(31,164)</td>
</tr>
<tr>
<td><strong>Full sample</strong></td>
<td><strong>45,048</strong></td>
</tr>
</tbody>
</table>

Note: The initial sample includes all public firms covered by Compustat. We exclude financial institutions and public utilities (4-digit SIC codes 6000-6999 and 4900-4999). In the second step we include all 10-K filings covered by the SEC EDGAR online filings website and merge the data with the data obtained from Compustat in the first step. We then delete observations without valid data on the estimated variables, as well as firm-year observations with SG&A expenses-to-sales ratio higher than one, and the extreme 1% of the estimated variables in the regression models.
### TABLE 2
Descriptive Statistics

#### Panel A: Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>25th Pctl</th>
<th>Median</th>
<th>75th Pctl</th>
</tr>
</thead>
<tbody>
<tr>
<td>REV</td>
<td>2,239.0</td>
<td>11,998</td>
<td>70.3</td>
<td>248.5</td>
<td>992.6</td>
</tr>
<tr>
<td>SGA</td>
<td>376.7</td>
<td>1,899</td>
<td>17.5</td>
<td>52.5</td>
<td>181.9</td>
</tr>
<tr>
<td>Δ\lnREV</td>
<td>0.06</td>
<td>0.25</td>
<td>-0.05</td>
<td>0.05</td>
<td>0.16</td>
</tr>
<tr>
<td>Δ\lnSGA</td>
<td>0.06</td>
<td>0.21</td>
<td>-0.04</td>
<td>0.05</td>
<td>0.15</td>
</tr>
<tr>
<td>SGA/REV</td>
<td>0.28</td>
<td>0.19</td>
<td>0.13</td>
<td>0.24</td>
<td>0.38</td>
</tr>
<tr>
<td>ASINT</td>
<td>0.18</td>
<td>0.87</td>
<td>-0.37</td>
<td>0.03</td>
<td>0.54</td>
</tr>
<tr>
<td>REVDEC</td>
<td>0.36</td>
<td>0.48</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>FLS Tone</td>
<td>-0.19</td>
<td>0.23</td>
<td>-0.35</td>
<td>-0.21</td>
<td>-0.05</td>
</tr>
<tr>
<td>EXP</td>
<td>0.48</td>
<td>0.35</td>
<td>0.25</td>
<td>0.50</td>
<td>0.75</td>
</tr>
</tbody>
</table>

#### Panel B: Frequency of observations by the sign of prior sales change and quintiles of FLS Tone

<table>
<thead>
<tr>
<th></th>
<th>Most negative tone</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Most positive tone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Sample</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Prior sales decrease</td>
<td>24%</td>
<td>22%</td>
<td>21%</td>
<td>18%</td>
<td>16%</td>
</tr>
<tr>
<td>Prior sales increase</td>
<td>18%</td>
<td>19%</td>
<td>20%</td>
<td>21%</td>
<td>22%</td>
</tr>
</tbody>
</table>

Note: \( Rev_{it} \) is the annual sales revenue of firm \( i \) in year \( t \) (in millions of dollars); \( SGA_{it} \) is annual SG&A expenses (in millions of dollars); \( Δ\lnREV_{it} \) is the log change of sales revenue \( [Δ\lnREV_{it} = \log (REV_{i,t} / REV_{i,t-1})] \); \( Δ\lnSGA_{it} \) is the log change of SGA \( [Δ\lnSGA_{i,t} = \log (SGA_{i,t} / SGA_{i,t-1})] \); \( ASINT_{it} \) is the log ratio of assets to REV \( [ASINT_{it} = \log (Assets_{i,t} / REV_{i,t})] \); \( REVDEC_{it} \) is an indicator variable that equals 1 if \( REV_{it} < REV_{i,t-1} \) and 0 otherwise; \( FLS \) Tone is the tone of management forward-looking statements (FLS) included in the Management Discussion and Analysis section (MD&A) of 10-K reports; \( EXP \) is the Tone variable transformed into a scaled-quintile format with values ranging from 0 to 1. The number of observations is equal to 45,048.
<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Description</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
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<tr>
<td><strong>Benchmark Model</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \beta_1 )</td>
<td>Sales Increase</td>
<td>0.667***</td>
<td>0.589***</td>
<td>0.583***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(21.06)</td>
<td>(18.97)</td>
<td>(18.86)</td>
</tr>
<tr>
<td>( \beta_2 )</td>
<td>Cost Asymmetry</td>
<td>-0.263***</td>
<td>-0.183***</td>
<td>-0.108***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-6.26)</td>
<td>(-4.05)</td>
<td>(-2.66)</td>
</tr>
<tr>
<td><strong>The Impact of Management Expectations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \gamma_1 )</td>
<td>Sales Increase</td>
<td>0.153***</td>
<td>0.157***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5.40)</td>
<td>(5.56)</td>
<td></td>
</tr>
<tr>
<td>( \gamma_2 )</td>
<td>Cost Asymmetry</td>
<td>-0.167***</td>
<td>-0.221***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-5.30)</td>
<td>(-7.68)</td>
<td></td>
</tr>
<tr>
<td>( \delta_1 )</td>
<td>Asset Intensity</td>
<td>-0.158***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-13.32)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intercepts</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>( \beta_0 )</td>
<td></td>
<td>0.008**</td>
<td>0.001</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.19)</td>
<td>(0.17)</td>
<td>(0.57)</td>
</tr>
<tr>
<td>( \gamma_0 )</td>
<td>Management Expectations</td>
<td>0.013**</td>
<td>0.012**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.36)</td>
<td>(2.04)</td>
<td></td>
</tr>
<tr>
<td>Adj-R(^2)</td>
<td></td>
<td>0.442</td>
<td>0.446</td>
<td>0.455</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>45,048</td>
<td>45,048</td>
<td>45,048</td>
</tr>
</tbody>
</table>

**Notes:**
1. The table presents the coefficients and the associated t-statistics (in parentheses) for the following regression model:

\[
\Delta \ln SGA_{i,t} = \beta_0 + \gamma_0 EXP_{i,t} + \left( \beta_1 + \gamma_1 EXP_{i,t} \right) \Delta \ln REV_{i,t} + \left( \beta_2 + \gamma_2 EXP_{i,t} \right) REV_{DEC_{i,t}} \Delta \ln REV_{i,t}^r + \delta_1 ASINT_{i,t} \Delta \ln REV_{i,t}^r + \epsilon_{i,t} \quad (1)
\]

2. See Table 2 for variable definitions.
3. *, **, *** - Significantly different from zero at the 0.10, 0.05, and 0.01 levels, respectively.
### TABLE 4
The Impact of Management Expectations on Cost Behavior in the Presence of High versus Low Degree of Unutilized Resources

#### Panel A - Regression Results

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Description</th>
<th>Unutilized Resources</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>( \beta_1 )</td>
<td>High Sales Increase</td>
<td>0.406***</td>
<td>0.629***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low Sales Increase</td>
<td>0.174***</td>
<td>0.123***</td>
<td></td>
</tr>
<tr>
<td>( \beta_2 )</td>
<td>High Cost Asymmetry</td>
<td>-0.233***</td>
<td>-0.146***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low Cost Asymmetry</td>
<td>-0.151***</td>
<td>-0.125***</td>
<td></td>
</tr>
<tr>
<td>( \gamma_0 )</td>
<td>Management Expectations</td>
<td>-0.021***</td>
<td>0.019***</td>
<td></td>
</tr>
<tr>
<td>( \gamma_1 )</td>
<td>Asset Intensity</td>
<td>-0.151***</td>
<td>-0.125***</td>
<td></td>
</tr>
<tr>
<td>( \gamma_2 )</td>
<td>Asset Intensity</td>
<td>0.016**</td>
<td>0.005</td>
<td></td>
</tr>
<tr>
<td>( \delta_{1} )</td>
<td>Cost Asymmetry</td>
<td>-0.151***</td>
<td>-0.125***</td>
<td></td>
</tr>
<tr>
<td>( \gamma_{0} )</td>
<td>Management Expectations</td>
<td>0.016**</td>
<td>0.005</td>
<td></td>
</tr>
<tr>
<td>Adj-R²</td>
<td>High</td>
<td>0.369</td>
<td>0.469</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>14,861</td>
<td>30,187</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Panel B - The Degree of Cost Asymmetry

<table>
<thead>
<tr>
<th>Unutilized Resources</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Expectations (EXP = 0)</td>
<td>( \beta_2 + \delta_{1} \times \text{ASINT} )</td>
<td>0.116***</td>
</tr>
<tr>
<td>The Effect of Positive Expectations</td>
<td>( \gamma_2 )</td>
<td>-0.233***</td>
</tr>
<tr>
<td>Positive Expectations (EXP = 1)</td>
<td>( \beta_2 + \gamma_2 + \delta_{1} \times \text{ASINT} )</td>
<td>-0.117***</td>
</tr>
</tbody>
</table>

Notes:
1. Panel A presents the regression results for the sub-samples of a high degree of unutilized resources (prior sales decrease) and a low degree of unutilized resources (prior sales increase). Specifically, it presents the coefficients and associated t-statistics (in parentheses) for the following regression model:

\[
\Delta \ln SG_{ij} = \beta_0 + \gamma_0 EXP_{j} + (\beta_1 + \gamma_1 EXP_{j}) \Delta \ln REV_{ij} + (\beta_2 + \gamma_2 EXP_{j}) \ln REV_{ij} + \delta_1 \times \text{ASINT}_{i} \ln REV_{ij} + \epsilon_{ij}
\]

2. Using the coefficient estimates in Panel A, Panel B quantifies the degree of cost asymmetry according to the degree of unutilized resources and management expectations.
3. See Table 2 for variable definitions.
4. *, **, *** - Significantly different from zero at the 0.10, 0.05, and 0.01 levels, respectively.
### TABLE 5
The Relative Importance of Management Expectations

<table>
<thead>
<tr>
<th>Coefficient Description</th>
<th>All (1)</th>
<th>High (2)</th>
<th>Low (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Incremental Effect on Sales Increase of:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\beta_1$</td>
<td>$0.344^{***}$</td>
<td>$0.319^{***}$</td>
<td>$0.376^{***}$</td>
</tr>
<tr>
<td></td>
<td>$(18.60)$</td>
<td>$(12.69)$</td>
<td>$(11.45)$</td>
</tr>
<tr>
<td>$\gamma_1$ EXP</td>
<td>$0.174^{***}$</td>
<td>$0.219^{***}$</td>
<td>$0.119^{**}$</td>
</tr>
<tr>
<td></td>
<td>$(5.25)$</td>
<td>$(5.97)$</td>
<td>$(2.53)$</td>
</tr>
<tr>
<td>$\lambda_1$ Low Unutilized Resources</td>
<td>$0.325^{***}$</td>
<td>$0.312^{***}$</td>
<td>$0.355^{***}$</td>
</tr>
<tr>
<td></td>
<td>$(12.01)$</td>
<td>$(7.79)$</td>
<td>$(9.68)$</td>
</tr>
<tr>
<td>$\nu_1$ EXP*Low Unutilized Resources</td>
<td>$-0.071^*$</td>
<td>$-0.087^*$</td>
<td>$-0.074$</td>
</tr>
<tr>
<td></td>
<td>$(-1.86)$</td>
<td>$(-1.83)$</td>
<td>$(-1.38)$</td>
</tr>
<tr>
<td><strong>The Incremental Effect on Cost Asymmetry of:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\beta_2$</td>
<td>$0.255^{***}$</td>
<td>$0.312^{***}$</td>
<td>$0.230^{***}$</td>
</tr>
<tr>
<td></td>
<td>$(8.63)$</td>
<td>$(7.33)$</td>
<td>$(5.05)$</td>
</tr>
<tr>
<td>$\gamma_2$ EXP</td>
<td>$-0.227^{***}$</td>
<td>$-0.330^{***}$</td>
<td>$-0.104^{**}$</td>
</tr>
<tr>
<td></td>
<td>$(-4.71)$</td>
<td>$(-4.62)$</td>
<td>$(-2.03)$</td>
</tr>
<tr>
<td>$\lambda_2$ Low Unutilized Resources</td>
<td>$-0.599^{***}$</td>
<td>$-0.584^{***}$</td>
<td>$-0.650^{***}$</td>
</tr>
<tr>
<td></td>
<td>$(-11.93)$</td>
<td>$(-12.13)$</td>
<td></td>
</tr>
<tr>
<td>$\nu_2$ EXP*Low Unutilized Resources</td>
<td>$0.107^{**}$</td>
<td>$0.171^*$</td>
<td>$0.076$</td>
</tr>
<tr>
<td></td>
<td>$(2.04)$</td>
<td>$(1.89)$</td>
<td>$(1.04)$</td>
</tr>
<tr>
<td>$\delta_1$ Asset Intensity</td>
<td>$-0.136^{***}$</td>
<td>$-0.141^{***}$</td>
<td>$-0.051^{**}$</td>
</tr>
<tr>
<td></td>
<td>$(-13.71)$</td>
<td>$(-9.62)$</td>
<td>$(-1.96)$</td>
</tr>
<tr>
<td><strong>Intercepts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\beta_0$</td>
<td>$0.003$</td>
<td>$0.017^{***}$</td>
<td>$-0.012^{**}$</td>
</tr>
<tr>
<td></td>
<td>$(0.69)$</td>
<td>$(2.66)$</td>
<td>$(2.33)$</td>
</tr>
<tr>
<td>$\gamma_0$ Tone</td>
<td>$0.012^{**}$</td>
<td>$0.004$</td>
<td>$0.025^{***}$</td>
</tr>
<tr>
<td></td>
<td>$(2.18)$</td>
<td>$(0.57)$</td>
<td>$(4.70)$</td>
</tr>
<tr>
<td>Adj-R$^2$</td>
<td>$0.476$</td>
<td>$0.448$</td>
<td>$0.506$</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>$45,048$</td>
<td>$22,526$</td>
<td>$22,522$</td>
</tr>
</tbody>
</table>

Notes:
1. The table presents the regression results for the full sample, as well as for the sub-samples of a high magnitude of adjustment costs (ASINT above the median) and a low magnitude of adjustment costs (ASINT below the median). Specifically, it presents the coefficients and associated t-statistics (in parentheses) for the following regression model:
   \[
   \Delta \ln SGA_{it} = \beta_0 + \gamma_0 \exp_{it} + \left( \beta_1 + \gamma_1 \exp_{it} + \lambda_1 \text{Low Unutilized Resources}_{it} + \nu_1 \exp \cdot \text{Low Unutilized Resources}_{it} \right) \Delta \ln \text{REV}_{it} + \Delta \ln \text{REVDEC}_{it} + \delta_1 \text{Asset Intensity}_{it} + \mu_{it}.
   \]  
   $(2)$
2. $\text{Low Unutilized Resources}_{it}$ is an indicator variable that equals 1 if $\text{REV}_{i}$ in year $t-1$ is higher than in year $t-2$ and 0 otherwise. See Table 2 for definitions of other variables.
3. * , ** , *** - Significantly different from zero at the 0.10, 0.05, and 0.01 levels, respectively.
### TABLE 6

The Combined Effect of Unutilized Resources, Adjustment Costs and Management Expectations on the Degree of Cost Asymmetry

<table>
<thead>
<tr>
<th>The Degree of Cost Asymmetry</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Degree of Unutilized Resources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Expectations (EXP = 0)</td>
<td>$\beta_2 + \delta_1 \ast ASINT$</td>
<td>0.195*** 0.253***</td>
</tr>
<tr>
<td>Positive Expectations (EXP = 1)</td>
<td>$\beta_2 + \gamma_2 + \delta_1 \ast ASINT$</td>
<td>-0.135** 0.149***</td>
</tr>
<tr>
<td><strong>Low Degree of Unutilized Resources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Expectations (EXP = 0)</td>
<td>$\beta_2 + \lambda_2 + \delta_1 \ast ASINT$</td>
<td>-0.388*** -0.397***</td>
</tr>
<tr>
<td>Positive Expectations (EXP = 1)</td>
<td>$\beta_2 + \lambda_2 + \gamma_2 + \nu_2 + \delta_1 \ast ASINT$</td>
<td>-0.538*** -0.424***</td>
</tr>
</tbody>
</table>

**Notes:**

1. The table presents an interpretation of the results reported for regression 2 in Table 5. Using the coefficient estimates in Table 5, Table 6 reports the degree of cost asymmetry according to the degree of unutilized resources, magnitude of adjustment costs, and management expectations.
2. See Table 2 for variable definitions.
3. *, **, *** - Significantly different from zero at the 0.10, 0.05, and 0.01 levels, respectively.