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Asymmetric Cost Behavior

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Abstract

The documentation of asymmetric cost behavior in response to changes in demand has attracted much scholarly attention over the past decade. Most studies propose that this cost asymmetry is due to the influence of management expectations on their deliberate resource allocation decisions. This study examines empirically the effect of management expectations on cost asymmetry, and, principally, the tension between these expectation-based decisions and constraints imposed on these decisions by two economic drivers of the cost asymmetry— 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) that documented asymmetric cost behavior, researchers have sought to understand the drivers of this phenomenon.¹ In their study, ABJ find that costs increase, on average, more when current sales rise than they decrease when current sales fall by an equivalent amount. They term this cost behavior as *sticky costs*. ABJ conjectured that firms experience these sticky costs because managers increase resources when sales rise but make a deliberate decision to maintain unutilized resources when they expect a current drop in sales to be temporary. In this way, they seek to minimize both current and future adjustment costs. Inspired by these findings, a number of studies have documented more generalized forms of the asymmetric cost behavior (e.g., *anti-sticky costs*; Weiss, 2010) and its existence in a variety of different contexts. These studies generally concur with the argument that managers' deliberate decision to adjust resources in response to both sales increases and decreases is the primary driver of asymmetric cost behavior (see Banker and Byzalov, 2014 for a review of this literature).

Underlying these managerial resource allocation decisions are expectations regarding future demand. These expectation-driven decisions have implications for both current and future costs of adjusting resources, such as severance payments, disposal costs of existing equipment, training costs, and installation costs of new equipment. However, despite the pivotal role of expectations in managers' resource adjustment decisions, there is no direct empirical evidence of how these expectations impact resource allocation choices and, by extension, the direction and magnitude of asymmetric cost behavior. The objective of this study is to fill this void in the literature by examining the effect of management expectations on cost asymmetry, and,

¹ See, for example, Banker and Chen (2006), Kama and Weiss (2013), Cannon (2014), and Noreen and Soderstrom (1997) who provide early, small sample, evidence for the existence of cost stickiness in hospitals.

principally, the tension between expectation-based resource adjustment decisions and constraints imposed on these decisions by the availability of unutilized resources and the cost of adjusting resources. Specifically, we first construct a direct measure of management, self-reported, expectations and examine the relation between this measure and the sign and magnitude of the cost asymmetry. Furthermore, since the literature suggests that management ability to make expectation-based resource adjustments is constrained by both resource adjustment costs and the degree of unutilized resources carried over the current period, we conduct a detailed analysis of the tension between these two constraints and management expectation-driven resource adjustment decisions.

Examining the relation between management expectations and cost asymmetry is important because it promotes our understanding of a firm's cost structure, which, in turn, affects earnings. Furthermore, prior literature provides ample evidence for the effect of cost asymmetry on a variety of financial variables (e.g., analysts forecasts, modeling future earnings, conservatism, accounting fundamentals), which are of interest to internal and external financial statement users.

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 to predict both current and future firm performance (e.g., Li, 2010a, 2010b; Wang and Hussainey, 2013).

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 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. This finding establishes a positive and significant relation between the favorableness of management FLS tone and the degree of cost stickiness and provides a validation of our measure of management expectations.

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 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 (e.g., Kama and Weiss, 2013; Banker et al., 2014). 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. Our 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 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.²

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 are consistent with the idea 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 decision-making when the cost of adjusting resources is low and managers have fewer unutilized resources. Together, this evidence supports our prediction that the impact of management expectations on resource allocation decisions is contextual.

² 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.

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. Importantly, 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).³ As discussed in Banker et al. (2014) and Banker and Byzalov (2014), this prior evidence likely 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. 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. Disentangling and separately analyzing the distinct and 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

³ Banker et al. (2014) find that when prior sales fall (rise) costs are on average anti-sticky (sticky) in the current period.

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 an identification of the role of each driver.⁴

Second, our 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, is new to the literature and highlights the importance of management expectations in shaping the sign of cost asymmetry. Third, our evidence on the combined effect 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 degree of initial unutilized resources is high *and* management expectations are negative. Having only one of these economic elements is not sufficient to result in cost anti-stickiness. This evidence enriches our understanding in how cost anti-stickiness arises. Identifying and understanding the building blocks that give rise to the sign of cost asymmetry may also benefit future research, since prior studies show that the sign of cost asymmetry affects a

⁴ 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 roles of each driver in determining firms' cost structure.

variety of financial variables as analyst forecasts, modeling future earnings, conservatism, and accounting fundamentals.

Fourth, 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 indicates that other economic determinants need to be considered when assessing the relevance of deliberate decisions in resource allocation. Finally, we contribute to the emerging body of literature that integrates managerial and financial research topics (e.g., Weiss, 2010; Chen et al., 2012; Dierynck et al., 2012; Kama and Weiss, 2013; Holzacker 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.⁵ 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.⁶ 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:

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 distinct measure of management expectations. Therefore, our empirical tests of this prediction are new to the literature and provide further validation of our empirical measure of management expectations.

⁵ 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).

⁶ 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 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 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 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: 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.⁷ 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.⁸ 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 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:

⁷ 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.

⁸ 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.

H3: 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 2014.⁹ 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,

⁹ The SEC mandate for U.S. public companies to file through the EDGAR online system began in 1994.

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.¹⁰ 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 sales (See Li, 2010a for a complete classification of FLS statements).^{11,12}

¹⁰ 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.

¹¹ 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.

¹² In a robustness test, we re-run our main tests based on a measure of tone of FLS that contain 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.

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):¹³

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

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 ; *average* $Tone_{i,t} = (Tone_{i,t-1} + Tone_{i,t})/2$.¹⁴ After obtaining the *average* $Tone$, we

¹³ For the lists of positive and negative words see 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.

¹⁴ 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

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 *EXP*.¹⁵

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.¹⁶ 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 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

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.

¹⁵ Approximately 54% of firm-year observations in our sample change their quintile ranking from year t-1 to year t.

¹⁶ 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).

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.¹⁷

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 predict various economic outcomes. Accordingly, our empirical measure of management expectations provides a more explicit identification of the role of these expectations in determining the sign and magnitude of cost asymmetry, distinctly from and incrementally to the degree of unutilized resources.¹⁸ 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 of the highest (most positive) tone

¹⁷ As discussed in the comprehensive reviews of this nascent literature by Li (2010b) and Lougharn and McDonald (2016), many additional studies have used word-lists to gauge tone in a variety of other contexts.

¹⁸ 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,

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 indicator variable that equals 1 if $\text{REV}_{i,t} < \text{REV}_{i,t-1}$ and 0 otherwise ($\text{REVDEC}_{i,t}$). 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 *LowUnutilizedResources* $_{i,t}$ as an indicator variable that equals 1 if REV_i in year $t-1$ is higher than in year $t-2$ and 0 otherwise.¹⁹ This measure builds on the notion that when prior sales have risen, managers are more likely to

¹⁹ 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.

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 to the current period, relative to when prior sales increase (e.g., Cannon, 2014).²⁰

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.²¹ Consequently, we use asset intensity, measured as the log of the ratio of total assets to sales revenues, to determine adjustment costs, $ASINT_{i,t} = \log (Assets_{i,t} / REV_{i,t})$.

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

²⁰ 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 REV in year t-1 is lower than in year t-2 *and* the change in the prior SG&A (i.e., SGA_{t-1}/SGA_{t-2}) is greater than or equal to the change in prior sales (i.e., REV_{t-1}/REV_{t-2}), and a low degree of unutilized resources otherwise. The second one defines observations as a high degree of unutilized resources when 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.

²¹ 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.

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 model²²:

$$\Delta \ln SG\&A_{it} = \beta_0 + \gamma_0 EXP_{it} + \left\{ \beta_1 + \gamma_1 EXP_{it} \right\} \Delta \ln REV_{it} + \left\{ \beta_2 + \gamma_2 EXP_{it} \right\} REVDEC_{it} \Delta \ln REV_{it} + \delta_1 ASINT_{it} REVDEC_{it} \Delta \ln REV_{it} + \varepsilon_{it} \quad (1)$$

Table 3, Column (1) reports the results from replicating the ABJ basic model. Consistent with previous studies, we find that the coefficient estimate on β_1 is 0.667 and significant, while that of β_2 is -0.263 and significant. These results suggest that a one percent increase in sales results 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, β_2 , captures the degree of cost stickiness.

The results in Column (2) show a negative and significant coefficient for γ_2 , the interaction between EXP and $REVDEC * \Delta \ln REV$. This coefficient indicates that when management has the most negative expectations (the lowest quintile of EXP), the degree of cost stickiness, β_2 , is -0.183, negative and significant. However, when management has the most positive expectations (the

²² 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).

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 (γ_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 β_1 and β_2 in Figure 1. From Figure 1, we see that both β_1 and β_2 are *monotonically* associated with management expectations. Specifically, β_1 increases monotonically from 0.585 in the lowest *EXP* quintile to 0.741 in the highest *EXP* quintile. Furthermore, β_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 β_1 and β_2 between these quintiles are both economically and statistically significant. The finding that β_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 γ_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).²³

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

²³ These results are quantitatively similar when using the two alternative measures of unutilized resources described in footnote 20.

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:

$$\begin{aligned} \Delta \ln SGA_{i,t} = & \beta_0 + \gamma_0 EXP_{it} + \left\{ \beta_1 + \gamma_1 EXP_{it} + \lambda_1 LowUnutilizedResources_{it} + \nu_1 EXP * LowUnutilizedResources_{it} \right\} \Delta \ln REV_{i,t} \\ & + \left\{ \beta_2 + \gamma_2 EXP + \lambda_2 LowUnutilizedResources_{it} + \nu_2 EXP * LowUnutilizedResources_{it} \right\} REVDEC_{it} \Delta \ln REV_{i,t} \\ & + \delta_1 ASINT_{i,t} REVDEC_{it} \Delta \ln REV_{i,t} + \mu_{it}. \end{aligned} \quad (2)$$

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 when the degree of unutilized resources is high is -0.227 (γ_2), and is significantly lower by 0.107 (ν_2) when it is low.²⁴

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

²⁴ 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.

are high (γ_2 in Column 2 is equal to -0.330, p-value < 0.01).²⁵ 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 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

²⁵ The value of γ_2 associated with a high magnitude of adjustment costs (-0.330) is significantly more negative than: (1) the value of γ_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.

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 $REVDEC * \Delta \ln REV$) and both the real change in Gross Domestic Product (GDP) and the log change in order backlog.²⁶ Additionally, we replicate the results after controlling for the degree of financial risk (measured as whether the ratio

²⁶ 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.

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 20). 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., $\Delta \ln REV$, $REVDEC$, 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 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.

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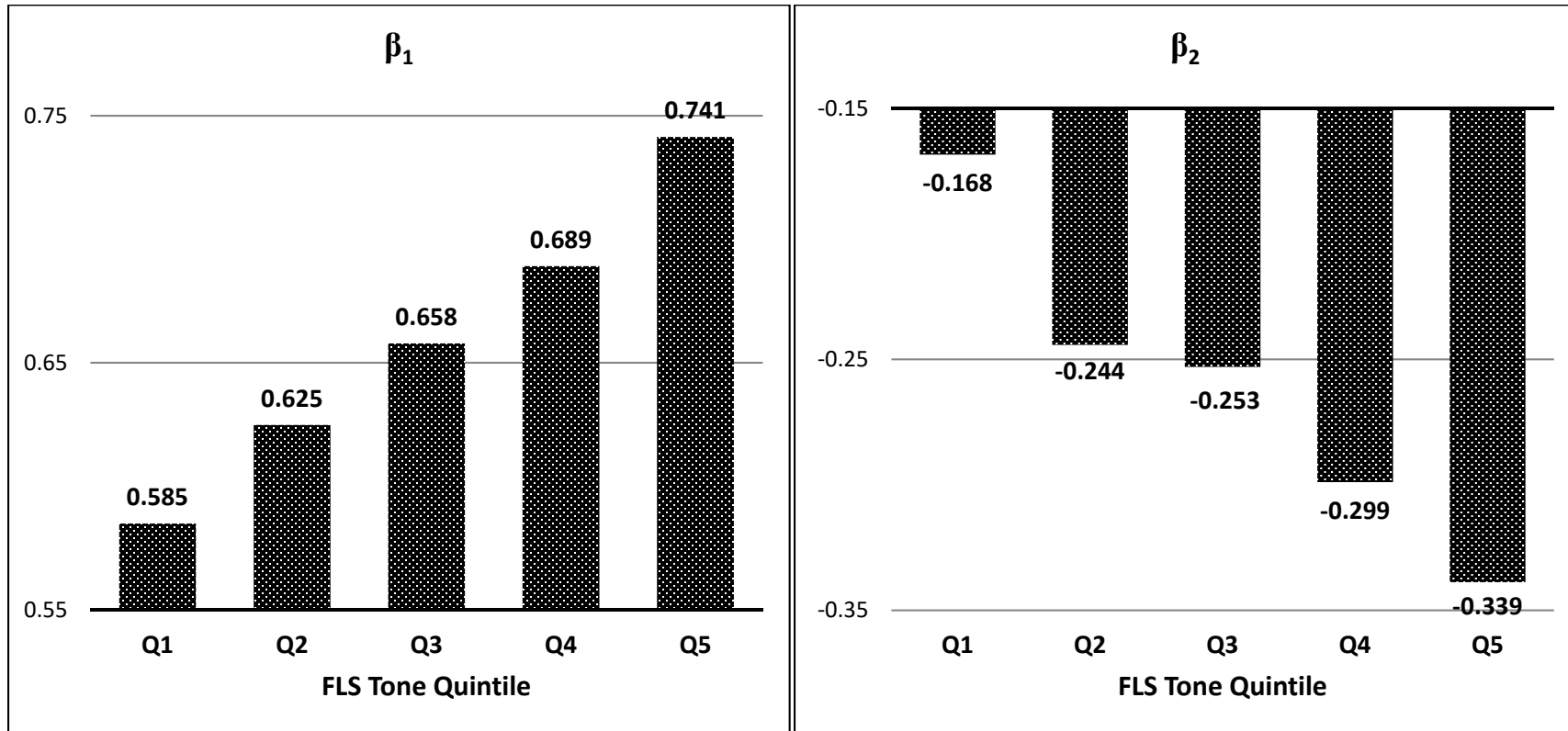
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FIGURE 1

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 β_1 and β_2 :

$$\Delta \ln SG A_{it} = \beta_0 + \beta_1 \Delta \ln REV_{it} + \beta_2 REVDEC_{it} \Delta \ln REV_{it} + \varepsilon_{it}$$

TABLE 1
Sample Selection

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

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

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

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

	Most negative tone	Q2	Q3	Q4	Most positive tone
Full Sample	20%	20%	20%	20%	20%
Prior sales decrease	24%	22%	21%	18%	16%
Prior sales increase	18%	19%	20%	21%	22%

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); $\Delta \ln REV_{it}$ is the log change of sales revenue [$\Delta \ln REV_{i,t} = \log (REV_{i,t} / REV_{i,t-1})$]; $\Delta \ln SGA_{it}$ is the log change of SGA [$\Delta \ln SGA_{i,t} = \log (SGA_{i,t} / SGA_{i,t-1})$]; $ASINT_{it}$ is the log ratio of assets to REV [$ASINT_{i,t} = \log (Assets_{i,t} / REV_{i,t})$]; $REVDEC_{it}$ 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 3

The Impact of Management Expectations on Cost Asymmetry

Coefficient	Description	(1)	(2)	(3)
<u>Benchmark Model</u>				
β_1	Sales Increase	0.667*** (21.06)	0.589*** (18.97)	0.583*** (18.86)
β_2	Cost Asymmetry	-0.263*** (-6.26)	-0.183*** (-4.05)	-0.108*** (-2.66)
<u>The Impact of Management Expectations</u>				
γ_1	Sales Increase		0.153*** (5.40)	0.157*** (5.56)
γ_2	Cost Asymmetry		-0.167*** (-5.30)	-0.221*** (-7.68)
δ_1	Asset Intensity			-0.158*** (-13.32)
<u>Intercepts</u>				
β_0		0.008** (2.19)	0.001 (0.17)	0.003 (0.57)
γ_0	Management Expectations		0.013** (2.36)	0.012** (2.04)
Adj-R ²		0.442	0.446	0.455
N		45,048	45,048	45,048

Notes:

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

$$\Delta \ln SGA_{i,t} = \beta_0 + \gamma_0 EXP_{i,t} + \left\{ \beta_1 + \gamma_1 EXP_{i,t} \right\} \Delta \ln REV_{i,t} + \left\{ \beta_2 + \gamma_2 EXP_{i,t} \right\} REVDEC_{i,t} \Delta \ln REV_{i,t} + \delta_1 ASINT_{i,t} REVDEC_{i,t} \Delta \ln REV_{i,t} + \varepsilon_{i,t} \quad (1)$$

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

Coefficient	Description	Unutilized Resources	
		High (1)	Low (2)
<u>Benchmark Model</u>			
β_1		0.406*** (20.30)	0.629*** (17.78)
β_2		0.134*** (4.26)	-0.274*** (-5.42)
<u>The Impact of Management Expectations</u>			
γ_1	Sales Increase	0.174*** (5.27)	0.123*** (3.50)
γ_2	Cost Asymmetry	-0.233*** (-4.24)	-0.146*** (-3.68)
δ_1	Asset Intensity	-0.151*** (-12.32)	-0.125*** (-6.23)
<u>Intercepts</u>			
β_0		-0.021*** (-4.09)	0.019*** (3.27)
γ_0	Management Expectations	0.016** (2.17)	0.005 (0.74)
Adj-R ²		0.369	0.469
N		14,861	30,187

Panel B - The Degree of Cost Asymmetry

		Unutilized Resources	
		High	Low
Negative Expectations (EXP = 0)	$\beta_2 + \delta_1 * ASINT$	0.116***	-0.301***
The Effect of Positive Expectations	γ_2	-0.233***	-0.146***
Positive Expectations (EXP = 1)	$\beta_2 + \gamma_2 + \delta_1 * ASINT$	-0.117***	-0.447***

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:

$$\Delta \ln SG_{i,t} = \beta_0 + \gamma_0 EXP_{i,t} + \left\{ \beta_1 + \gamma_1 EXP_{i,t} \right\} \Delta \ln REV_{i,t} + \left\{ \beta_2 + \gamma_2 EXP_{i,t} \right\} REVDECA_{i,t} \Delta \ln REV_{i,t} + \delta_1 ASINT_{i,t} REVDECA_{i,t} \Delta \ln REV_{i,t} + \varepsilon_{i,t} \quad (1)$$

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

Coefficient	Description	Adjustment Costs		
		All	High	Low
		(1)	(2)	(3)
<u>The Incremental Effect on Sales Increase of:</u>				
β_1		0.344*** (18.60)	0.319*** (12.69)	0.376*** (11.45)
γ_1	EXP	0.174*** (5.25)	0.219*** (5.97)	0.119** (2.53)
λ_1	Low Unutilized Resources	0.325*** (12.01)	0.312*** (7.79)	0.355*** (9.68)
ν_1	EXP*Low Unutilized Resources	-0.071* (-1.86)	-0.087* (-1.83)	-0.074 (-1.38)
<u>The Incremental Effect on Cost Asymmetry of:</u>				
β_2		0.255*** (8.63)	0.312*** (7.33)	0.230*** (5.05)
γ_2	EXP	-0.227*** (-4.71)	-0.330*** (-4.62)	-0.104** (-2.03)
λ_2	Low Unutilized Resources	-0.599*** (-19.10)	-0.584*** (-11.93)	-0.650*** (-12.13)
ν_2	EXP*Low Unutilized Resources	0.107** (2.04)	0.171* (1.89)	0.076 (1.04)
δ_1	Asset Intensity	-0.136*** (-13.71)	-0.141*** (-9.62)	-0.051** (-1.96)
<u>Intercepts</u>				
β_0		0.003 (0.69)	0.017*** (2.66)	-0.012** (-2.33)
γ_0	Tone	0.012** (2.18)	0.004 (0.57)	0.025*** (4.70)
Adj-R ²		0.476	0.448	0.506
N		45,048	22,526	22,522

Notes:

- 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:

$$\Delta \ln SGA_{i,t} = \beta_0 + \gamma_0 EXP_{it} + \{ \beta_1 + \gamma_1 EXP_{it} + \lambda_1 LowUnutilized Resources_{it} + \nu_1 EXP * LowUnutilized Resources_{it} \} \Delta \ln REV_{i,t} + \{ \beta_2 + \gamma_2 EXP + \lambda_2 LowUnutilized Resources_{it} + \nu_2 EXP * LowUnutilized Resources_{it} \} REVDEC_{it} \Delta \ln REV_{i,t} + \delta_1 ASINT_{it} REVDEC_{it} \Delta \ln REV_{i,t} + \mu_{it} \quad (2)$$

- $LowUnutilizedResources_{i,t}$ is an indicator variable that equals 1 if REV_i in year t-1 is higher than in year t-2 and 0 otherwise. See Table 2 for definitions of other variables.
- *, **, *** - 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

The Degree of Cost Asymmetry		Adjustment Costs	
		High	Low
<u>High Degree of Unutilized Resources</u>			
Negative Expectations (EXP = 0)	$\beta_2 + \delta_1 * ASINT$	0.195***	0.253***
Positive Expectations (EXP = 1)	$\beta_2 + \gamma_2 + \delta_1 * ASINT$	-0.135**	0.149***
<u>Low Degree of Unutilized Resources</u>			
Negative Expectations (EXP = 0)	$\beta_2 + \lambda_2 + \delta_1 * ASINT$	-0.388***	-0.397***
Positive Expectations (EXP = 1)	$\beta_2 + \lambda_2 + \gamma_2 + \nu_2 + \delta_1 * ASINT$	-0.538***	-0.424***

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.