Management Expectations and 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 suggest that this cost asymmetry is due to the influence of management expectations on their deliberate resource allocation decisions. Our study contributes to this research by providing direct empirical evidence in support of this explanation. Using the tone in the forward-looking statements (FLS) of a sample of 10-K reports 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. In addition, we examine the interaction between management expectations and the amount of slack resources available. When the amount of slack resources is high, we find that negative expectations result in anti-stickiness, whereas positive expectations result in sticky cost behavior. Accordingly, we find that managers' expectation-driven decisions can reverse the previously documented anti-sticky cost behavior imposed by high slack resources. Finally, we find that the impact of management expectations on the degree of cost asymmetry is strongest when both the initial amount of slack resources and the magnitude of the adjustment costs are high. Conversely, when both the magnitude of the adjustment costs and the initial amount of slack resource are low, management expectations have no impact on the degree of cost asymmetry. Our combined evidence supports the explanation that management expectations influence their resource allocation decisions, and indicates that other economic determinants may need to be considered when assessing the impact of these decisions on a firm's cost structure.

Management Expectations and Asymmetric Cost Behavior

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 (e.g., Banker and Chen, 2006; Kama and Weiss, 2013; Cannon, 2014). 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 argue that firms experience these sticky costs because managers increase resources when sales rise but make a deliberate decision to maintain slack 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 (e.g., disposal costs of existing equipment and installation costs of new equipment when demand bounces back). 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 (e.g., Anderson et al., 2007; ABJ). 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 role of expectations in managers' resource adjustment decisions, there is limited direct empirical evidence of how these expectations impact resource

allocation choices and, by extension, the direction and magnitude of asymmetric cost behavior.[1] The objective of this study is to fill this void in the literature by developing a direct measure of management expectations. We then use this measure to examine the effect of management expectations on cost asymmetry as well as the interaction between expectation-based resource adjustment decisions, slack resource availability, and adjustment costs. Specifically, we first examine the direct impact of management expectations on the sign and magnitude of the cost asymmetry. In addition, since the literature suggests that management's ability to make expectation-based resource adjustments is constrained by both resource adjustment costs and the amount of slack (or unutilized) resources carried over the current period, we examine the interaction 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 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.,

[1] Banker at al. (2014) use prior sales changes as a *combined* empirical proxy for slack resources and managerial expectations and examine the association between this proxy and asymmetric cost behavior. They find that when prior sales fall (rise) costs are on average anti-sticky (sticky) in the current period. As we demonstrate in this study, disentangling the effects of management expectations and the amount of slack resources and testing the tension between the distinct effects of these two constructs on asymmetric cost behavior yields several new and important insights to this literature.

Li, 2010a, 2010b; Wang and Hussainey, 2013). In addition, Bozanic et al. (2015) find that both the quantitative and non-quantitative information in these statements are associated with investor beliefs about firm value as well as analyst forecasts of future earnings.

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. These tests establish a positive and significant relation between the favorableness of management FLS tone and the degree of cost stickiness. That is, as expectations become more favorable, managers increase costs to a greater extent when sales rise and decrease costs by a lesser extent when sales fall.

We continue the analysis by examining the interaction between management expectation-driven resource adjustment decisions and the constraints imposed on these decisions by the amount of slack resources carried over the current period. Prior research has found that having fewer slack resources available at the beginning of a period (measured as a rise in prior sales) results in sticky cost behavior, whereas a greater amount of slack resources leads to anti-sticky cost behavior (e.g., Kama and Weiss, 2013; Banker et al., 2014). In our study, we find a positive and significant relation between management expectations and the degree of cost stickiness when there are fewer slack resources. We also find that when there is a greater amount of slack resources, pessimistic management expectations result in anti-sticky cost behavior, whereas optimistic management expectations result in sticky cost behavior. These findings are consistent with our hypotheses and show that expectation-driven decisions can actually reverse the previously documented anti-sticky cost behavior imposed by high slack resources. They thus underscore 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 amount of unutilized resources, management expectations should play a more significant role when there is a greater amount of slack resources.[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 amount of initial slack resources. Using assets 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 initial amount of slack resources are high. Conversely, when the magnitude of adjustment costs and the initial amount of slack resource are both low, we find that management expectations have no impact on the degree of cost asymmetry. These results are consistent with the idea that expectations should matter most for those managers who are

[2] When the amount of slack resources available at the beginning of the period is high, managers may use these slack 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* amount of unutilized resources, they have a lower degree of discretion, and thus will need to increase resources almost proportionally in the current period in response to an increase in sales.

concerned about the costs of resource adjustment and who have flexibility due to a greater amount of slack 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. Combined, this evidence supports our prediction that the impact of management expectations on resource allocation decisions is contextual.

In our final analysis we examine the combined effect of management expectations, slack resources, and adjustment costs on the overall sign and magnitude of the cost asymmetry. We find the highest degree of cost *stickiness* occurs when there is a low amount of slack resources, a high magnitude of adjustment costs, and management is optimistic about the future. In contrast, we find the highest cost *anti-stickiness* occurs when all three drivers operate in the opposite direction. These findings 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 direct empirical evidence for the role of management expectations in shaping the cost asymmetry. This evidence supports the prevailing argument in the literature that management expectations motivate them to make decisions that impact the firms' cost structure. Second, we provide evidence that the impact of management expectations on the sign and magnitude of cost asymmetry depends on both the amount of slack resources available and the magnitude of the adjustment costs. This finding suggests that other economic determinants need to be considered when assessing the relevance of deliberate decisions in resource allocation. Third, our evidence on the combined effect of management expectations, slack resources, and adjustment costs on the sign and magnitude of cost asymmetry lends insight to the question of how cost asymmetry arises. Finally, we contribute to the emerging body of literature that integrates managerial and

financial research topics (e.g., Weiss, 2010; Chen at el., 2012; Dierynck et al., 2012; Kama and Weiss, 2013; Banker et al., 2015; Holzhacker, 2015) by examining the relation between management FLS tone in corporate financial reports and internal resource allocation decisions.

The rest of the paper proceeds as follows. 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. 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 (e.g., Banker et al., 2013). Accordingly, when sales rise, managers with positive expectations are likely to increase resources more aggressively, resulting in greater cost stickiness.

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.[3] 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.

To illustrate this argument in Figure 1, we assume a firm produces a single product and Y_{t-1} is the activity level in period *t-1*. For simplicity, we assume that the realized activity level in period *t* is either low, $Y_L^t < Y_{t-1}$, or high, $Y_H^t > Y_{t-1}$. In period *t*, when management expectations are positive and the activity level realization is low, managers are less likely to push for cutting resources. Similarly, when management expectations are positive in period *t* and the activity level realization is high, managers are more likely to expedite resource consumption.[4] This logic leads to our first hypothesis:

H1: The degree of cost stickiness is increasing in the positiveness of management expectations

2.2 The impact of management expectations on cost asymmetry in the presence of constraints imposed by the amount of initial slack resources

As mentioned, another important driver of the observed variation in cost asymmetry is the amount of slack resources (or capacity) 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 amount of slack resources carried over the current period on the variation in cost asymmetry.

[3] 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 slack 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.

[4] For brevity, the example presented in Figure 1 assumes, without loss of generality, a linear cost function in period t-1. Management positive expectations increase the extent of cost stickiness regardless of the degree of cost stickiness in *t*-1.

High initial amount of slack resources

Prior studies have argued that managers with a greater amount of slack resources can use these resources to respond to an increase in sales, reducing the need to acquire additional resources. However, when current sales decrease, the combination of the existing slack resources and the newly created slack resources may exceed acceptability thresholds, causing managers to reduce these resources. Accordingly, managers with a greater amount of initial slack resources would adjust resources more quickly when demand falls than when demand rises. These actions have been shown by prior literature to be associated with anti-sticky cost behavior (e.g., Balakrishnan et al., 2004; Banker et al., 2014).

Consistent with prior literature, we argue that this cost anti-stickiness should be greater for managers whose future demand expectations are bleak. Such managers will be less willing to incur adjustment costs associated with slack resources they do not anticipate using in the future. They will also be more aggressive in cutting slack resources when demand falls, but more reluctant in increasing resources when demand increases. These managers differ in their decisions from those whose expectations are positive. Optimistic managers will assume that they can use available slack in the future and will thus be less likely to make aggressive slack resource cuts 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 actually induce sticky behavior, *even when the amount of initial slack resources is high*. Accordingly, we predict:

H2a: Management positive expectations diminish the anti-sticky costs imposed by a high amount of slack resources

Low initial amount of slack resources

We next consider the case when managers are faced with fewer initial slack resources. These managers will need to increase resources almost proportionally when demand increases, but can better afford to retain slack resources when demand falls. As a result, when slack resources are 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 slack resources are low. Specifically, when managers have positive future demand expectations we expect that the degree of cost stickiness will intensify. Optimistic managers will assume that they can use available slack in the future and will thus be less likely to make slack resource cuts when demand falls and are likely to increase resources more aggressively when current demand rises. In contrast, managers with pessimistic 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-sticky cost behavior). Accordingly, we predict the following:

H2b: Management positive expectations intensify the cost stickiness imposed by a low amount of slack 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.[5] We also predict that management expectations should play a more significant role when the amount of slack resources is high. For example, if demand increases, a manager with a greater amount of slack resources should rely more on her expectations to determine if resources beyond those available from the unutilized slack are necessary. By contrast, a manager with fewer slack resources has a lower degree of discretion in making resource allocation decisions, and therefore will not need to rely as heavily on her expectations of future demand.[6] 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 amount of available slack resources is high. Combining this argument with the discussion in sections 2.1 and 2.2, we hypothesize that:

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 initial amount of slack 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

[5] As mentioned above, if adjustment costs were negligible (e.g., adjustment costs of direct materials), then costs would be variable and 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.

[6] At the extreme, when the amount of initial slack 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.

accompanied by a low (high) amount of slack 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

To conduct our study, we obtain our initial sample from the set of all public firms covered by Compustat from 1994-2014. From this sample, we exclude both 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. Since we adjust the dollar amounts of our estimated variables for inflation, we estimate the yearly inflation rates for our sample using monthly inflation data from CRSP U.S. Treasury and 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.[7] 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.

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

3.2 Measuring management expectations

To measure management expectations, we identify the tone exhibited in the management forward-looking statements (FLS) included in the *Management Discussion and Analysis* section (MD&A) of the 10-K reports for the firms in our sample. FLS provide a comprehensive view of management expectations regarding various aspects of the business that may 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). Using the tone of FLS to measure management expectations is motivated by recent research examining the relation between management tone in FLS and a 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, a finding consistent with the idea that FLS provide forward looking information about the company. In another study, Bozanic et al. (2015) find evidence that suggests that the forward looking information in these statements is at least partially understood by the market. Specifically, they find that forward-looking statements are positively associated with both market reactions and changes in analyst forecast accuracy.[8]

To identify the tone of the FLS for the firms in our sample, we first extract the MD&A section of each 10-K filing using Perl programing language. The forward-looking statements in a

[8] Management earnings guidance (EG) can also be used as a measure of management expectations. However, 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.

given MD&A are identified using the method outlined in Li (2010a, Appendix B) and Bozanic et al. (2015, Appendix A). Next, we calculate the tone of the 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):[9]

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

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* $Tone_{i,t} = (Tone_{i,t-1} + Tone_{i,t})/2$.[10]

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 *EXP*.

3.3 Variable definitions

The dependent variable in our regression models is the log change of SG&A expenses

[9] For the lists of positive and negative words see http://www3.nd.edu/~mcdonald/Word_Lists.html

[10] We repeated the analysis using the tone at either the beginning or the end of the year (instead of an average) obtaining similar results.

(SGA) for firm *i* in year *t* ($\Delta lnSGA_{i,t}$); $\Delta lnSGA_{i,t} = \log (SGA_{i,t} / SGA_{i,t-1})$. 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 [$\Delta lnREV_{i,t} = \log (REV_{i,t} / REV_{i,t-1})$], and an indicator variable that equals 1 if $REV_{it}<REV_{i,t-1}$ and 0 otherwise ($REVDEC_{it}$). Following previous studies, we use prior sales change to measure the amount of initial slack resources. Specifically, if managers faced a sales increase in the past, they may have drawn on slack resources to meet demand, leading to a lower amount of slack resources available for the current period.[11] We define $LowSlack_{i,t}$ as an indicator variable that equals 1 if REV_i in year *t*-1 is higher than in year *t*-2 and 0 otherwise. 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.[12] 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

[11] As mentioned in footnote 1, Banker et al. (2014) assume a prior sales increase (decrease) captures both low (high) amount of slack resources, and optimistic (pessimistic) management expectations. By measuring slack resources and expectations distinctively, we are able disentangle these effects and examine the degree of cost asymmetry when a high (low) amount of slack resources is accompanied by positive (negative) management expectations.

[12] 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.

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[13]:

$$\Delta \ln SGA_{it} = \beta_0 + \gamma_0 EXP_{it} + \{\beta_1 + \gamma_1 EXP_{it}\}\Delta \ln REV_{it} + \{\beta_2 + \gamma_2 EXP_{it}\}\text{REVDEC}_{it}\Delta \ln REV_{it} + \delta_1 \text{ASINT}_{it}\text{REVDEC}_{it}\Delta \ln REV_{it} + \varepsilon_{it}. \quad (1)$$

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 (bp) increase in SG&A expenses, while a one percent decrease in sales results in a (66.7 - 26.3 =) 40.4 bp 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*ΔlnREV*. This coefficient indicates that when management is most pessimistic (the lowest quintile of *EXP*), the degree of cost stickiness, β_2, is -0.183, negative and significant. However, when management is most optimistic (the highest

[13] 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).

quintile of *EXP*), the degree of cost stickiness significantly intensifies by 0.167 to -0.350. This finding provides support to our hypothesis 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 bp (γ_1) when managers are most optimistic compared to when they are most pessimistic. Conversely, the results show that when sales fall, management expectations attenuate the reduction in expenses by 6.4 bp ($\gamma_1 + \gamma_2 = 0.157 - 0.221 = -0.064$, 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 2. From Figure 2, 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.

Overall, the evidence presented in Table 3 and Figure 2 provides an initial direct support for the role managers' expectations play in shaping a firm's cost structure.

4.2 The impact of management expectations on cost asymmetry in the presence of constraints imposed by the amount of initial slack resources

We next examine the results of estimating regression model (1) for sub-samples of high and low levels of slack resources ($LowSlack_{i,t}$ = 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 level of initial slack resources.

Using the coefficient estimates in Panel A, Panel B reports the degree of cost asymmetry according to the amount of slack resources and management expectations. The results in Panel B indicate that the degree of cost *anti-stickiness* associated with a high amount of slack resources is 0.116 when managers are most pessimistic. Consistent with H2a, the degree of anti-stickiness significantly diminishes by 0.233 when managers are most optimistic, leading to a significant cost stickiness of -0.117. Also, consistent with H2b, when the amount of slack resources is low, we find that the degree of cost stickiness is -0.301 when managers are most pessimistic, intensifying to -0.447 when managers are most optimistic.

Overall, we conclude that the findings in Table 4 support our second hypothesis. Furthermore, they also show that managers' expectation-driven decisions can not only eliminate but also cause a reversal in the anti-sticky cost behavior imposed by high slack 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 impact of both the amount of slack resources and the magnitude of adjustment costs on the relation between management expectations and cost asymmetry (H3) by estimating the following regression model:

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

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 amounts of slack resources. Specifically, the impact of management expectations on cost asymmetry when slack is high is -0.227 (γ_2), and is significantly lower by 0.107 (ν_2) when slack is low.[14]

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 initial amount of slack resource are high (γ_2 in Column 2 is equal to -0.330, p-value < 0.01).[15] However, when both the magnitude of adjustment costs and the initial amount of slack resource are low, management

[14] The combined effect for a low amount of slack resources is $\gamma_2 + \nu_2 = -0.120$, significantly different from zero at the 0.01 level.

[15] 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.

expectations 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 slack 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 slack 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 amount of slack 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 amount of slack 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 amount of slack resources, a low magnitude of adjustment costs, and pessimistic management 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 amount of slack resources, a high magnitude of adjustment costs, and optimistic management 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 Additional analyses

We test for the robustness of our main results by performing the following analyses (untabulated for brevity). First, we re-run our regressions using four alternative tone measures: FLS Tone above (below) the median as a measure for management optimism (pessimism); Positive (negative) FLS Tone as a measure for management optimism (pessimism)*;* FLS Tone transformed into a scaled-decile variable; and FLS tone as a continuous variable. Second, we re-run our analyses controlling for both order backlog and the change in Gross Domestic Product (GDP), as prior studies suggest that these two variables may affect management expectations. Third, 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*, *LowSlack*, and *ASINT*). Fourth, 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. The results for all of the above robustness tests remain qualitatively similar to those in our main analyses.

5. Conclusion

The asymmetry of cost behavior in 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 amount of slack resources is high, negative expectations result in anti-stickiness, whereas positive expectations result in sticky cost behavior. Accordingly, we find that management expectations can reverse the anti-sticky cost behavior imposed by high slack 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 initial amount of slack resource are high. Conversely, when both the magnitude of adjustment costs and the initial amount of slack resource 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 amount of slack resources, a high magnitude of adjustment costs, and optimistic management 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 available slack 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.

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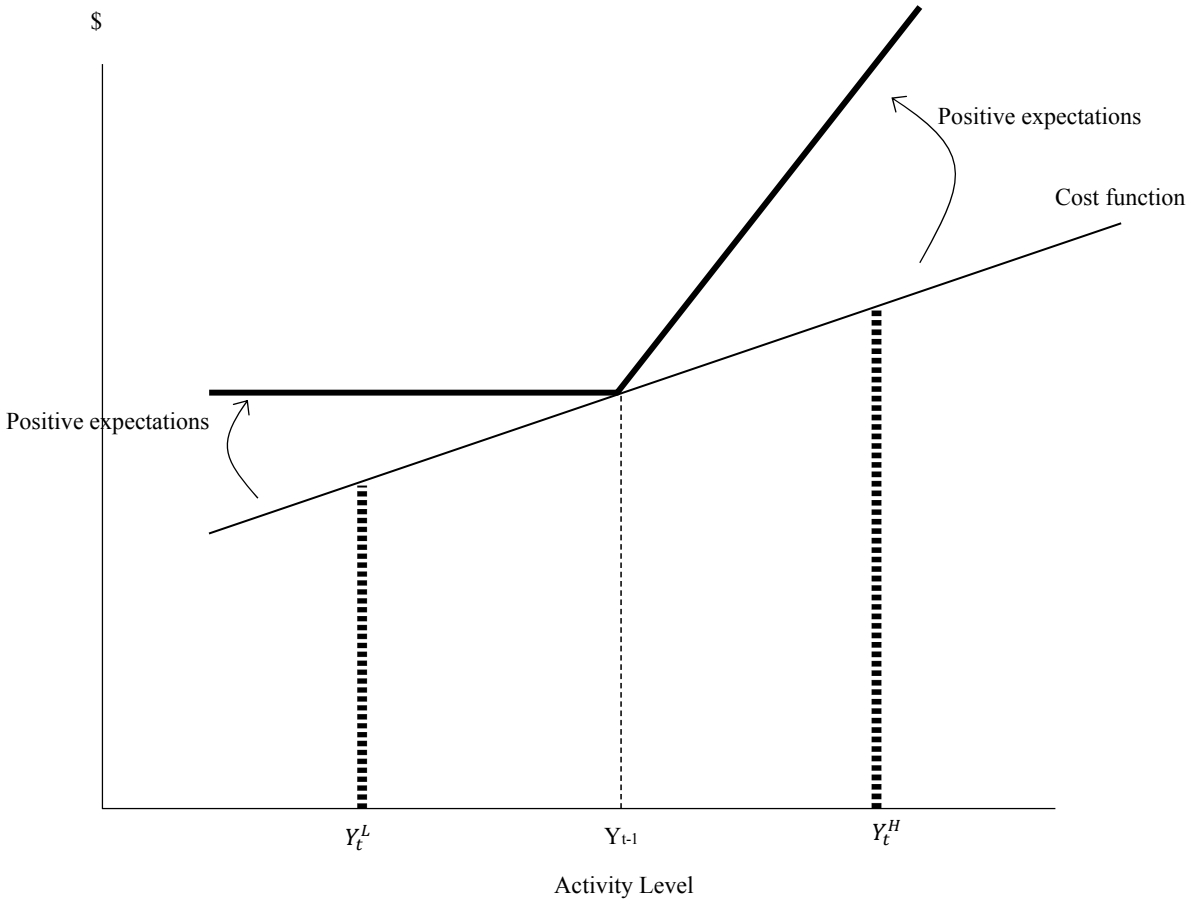
FIGURE 1

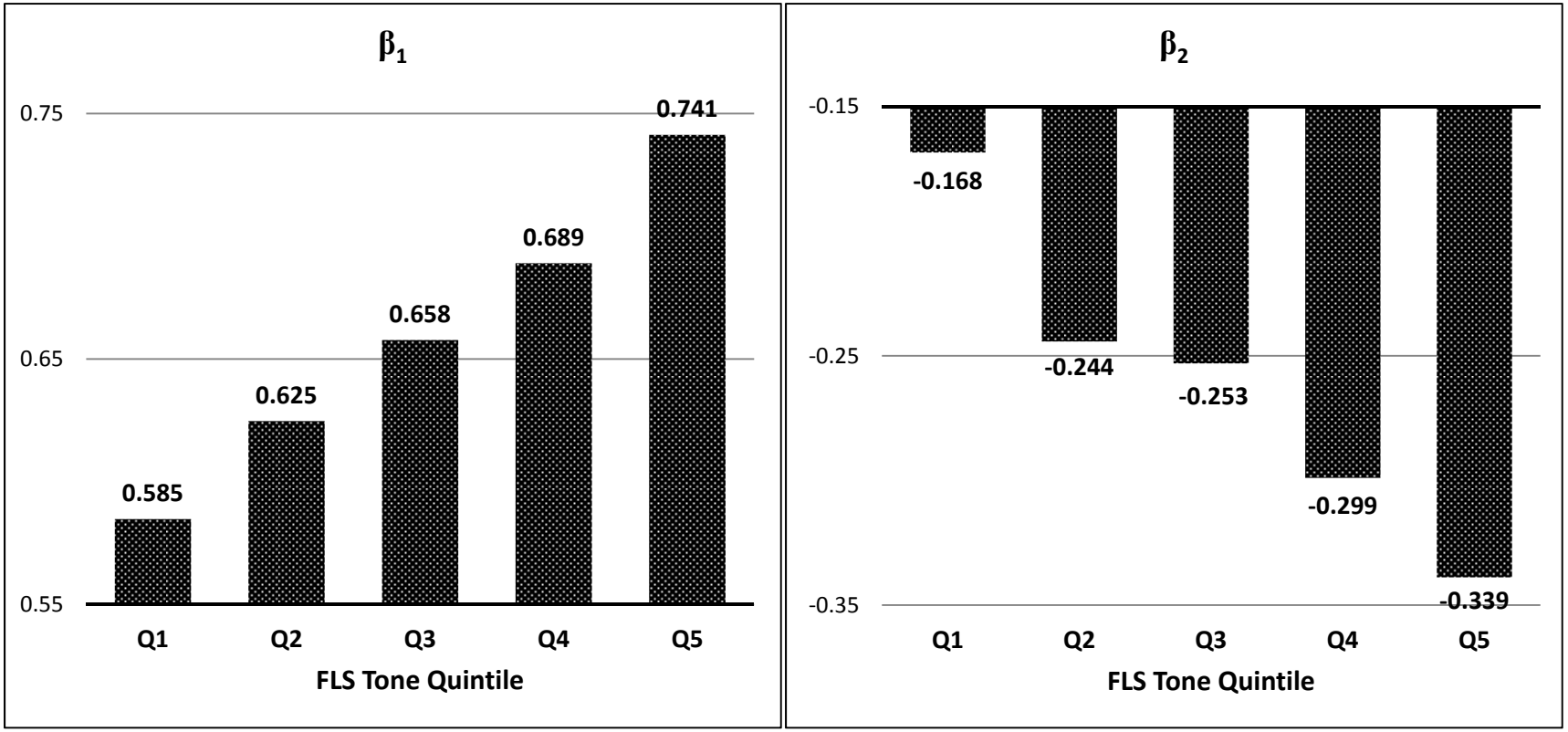
Positive expectations increase the degree of cost asymmetry



The figure indicates 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. 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, resulting in greater cost stickiness. 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. 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.

FIGURE 2

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:

$$\Delta \ln SGA_{it} = \beta_0 + \beta_1 \Delta \ln REV_{it} + \beta_2 \text{REVDEC}_{it} \Delta \ln REV_{it} + \varepsilon_{it}$$

TABLE 1

Sample Selection

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

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

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); $\Delta lnREV_{it}$ is the log change of sales revenue [$\Delta \ln REV_{i,t} = \log (REV_{i,t} / REV_{i,t-1})$]; $\Delta lnSGA_{it}$ 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)
Benchmark Model				
β_1	Sales Increase	0.667***	0.589***	0.583***
		(21.06)	(18.97)	(18.86)
β_2	Cost Asymmetry	-0.263***	-0.183***	-0.108***
		(-6.26)	(-4.05)	(-2.66)
The Impact of Management Expectations				
γ_1	Sales Increase		0.153***	0.157***
			(5.40)	(5.56)
γ_2	Cost Asymmetry		-0.167***	-0.221***
			(-5.30)	(-7.68)
δ_1	Asset Intensity			-0.158***
				(-13.32)
Intercepts				
β_0		0.008**	0.001	0.003
		(2.19)	(0.17)	(0.57)
γ_0	Management Expectations		0.013**	0.012**
			(2.36)	(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:

$$\Delta \ln SGA_{i,t} = \beta_0 + \gamma_0 EXP_{i,t} + \{\beta_1 + \gamma_1 EXP_{i,t}\}\Delta \ln REV_{i,t} + \{\beta_2 + \gamma_2 EXP_{i,t}\}\text{REVDEC}_{i,t}\Delta \ln REV_{i,t} + \delta_1 \text{ASINT}_{i,t}\,\text{REVDEC}_{i,t}\Delta \ln REV_{i,t} + \varepsilon_{i,t} \quad (1)$$

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 Slack Resources

Panel A - Regression Results

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

Panel B - The Degree of Cost Asymmetry

		Slack Resources: High	Slack Resources: 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 amount of initial slack resources (prior sales decrease) and a low amount of initial slack resources (prior sales increase). Specifically, it presents the coefficients and associated t-statistics (in parentheses) for the following regression model:

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

2. Using the coefficient estimates in Panel A, Panel B reports the degree of cost asymmetry according to the amount of slack 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)
The Incremental Effect on Sales Increase of:				
β_1		0.344***	0.319***	0.376***
		(18.60)	(12.69)	(11.45)
γ_1	EXP	0.174***	0.219***	0.119**
		(5.25)	(5.97)	(2.53)
λ_1	Low Slack	0.325***	0.312***	0.355***
		(12.01)	(7.79)	(9.68)
ν_1	EXP * Low Slack	-0.071*	-0.087*	-0.074
		(-1.86)	(-1.83)	(-1.38)
The Incremental Effect on Cost Asymmetry				
β_2		0.255***	0.312***	0.230***
		(8.63)	(7.33)	(5.05)
γ_2	EXP	-0.227***	-0.330***	-0.104**
		(-4.71)	(-4.62)	(-2.03)
λ_2	Low Slack	-0.599***	-0.584***	-0.650***
		(-19.10)	(-11.93)	(-12.13)
ν_2	EXP * Low Slack	0.107**	0.171*	0.076
		(2.04)	(1.89)	(1.04)
δ_1	Asset Intensity	-0.136***	-0.141***	-0.051**
		(-13.71)	(-9.62)	(-1.96)
Intercepts				
β_0		0.003	0.017***	-0.012**
		(0.69)	(2.66)	(-2.33)
γ_0	Tone	0.012**	0.004	0.025***
		(2.18)	(0.57)	(4.70)
Adj-R^2		0.476	0.448	0.506
N		45,048	22,526	22,522

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:

$$\Delta \ln SGA_{i,t} = \beta_0 + \gamma_0 EXP_{it} + \left\{\beta_1 + \gamma_1 EXP_{it} + \lambda_1 LowSlack_{it} + \nu_1 EXP * LowSlack_{it}\right\} \Delta \ln REV_{i,t}$$
$$+ \left\{\beta_2 + \gamma_2 EXP + \lambda_2 LowSlack_{it} + \nu_2 EXP * LowSlack_{it}\right\} \text{REVDEC}_{it} \, l\Delta \ln REV_{i,t} \quad (2)$$
$$+ \delta_1 \text{ASINT}_{i,t} \text{REVDEC}_{it} \Delta \ln REV_{i,t} + \mu_{it},$$

2. $LowSlack_{i,t,}$ 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.
3. *, **, *** - Significantly different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE 6

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

The Degree of Cost Asymmetry		Adjustment Costs High	Adjustment Costs Low
High Slack Resources			
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***
Low Slack Resources			
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 amount of slack 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.