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The Agency Problem, Corporate Governance, and the Asymmetrical Behavior of Selling, General, and Administrative Costs*

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1. Introduction

Selling, general, and administrative (SG&A) costs represent a significant proportion of the costs of business operations. On average, the SG&A costs to total assets ratio is 27 percent, compared to the research and development (R&D) to total assets ratio of 3 percent (Banker, Huang, and Natarajan 2011). Due to the importance of SG&A costs, practitioners pay close attention to controlling SG&A spending. Understanding SG&A cost behavior and the role of managers in adjusting the costs is thus important to researchers and practitioners. Recent empirical research indicates that SG&A costs behave asymmetrically, that is, they increase more rapidly when demand increases than they decline when demand decreases (Anderson, Banker, and Janakiraman 2003). This phenomenon (also labeled "cost stickiness") has received much attention in the accounting literature (e.g., Balakrishnan and Gruca 2008; Anderson and Lanen 2007; Balakrishnan and Soderstrom 2009; Banker, Byzalov, and Plehn-Dujowich 2010).

Prior studies have predominantly explained cost stickiness with economic factors such as asset intensity and uncertainty of future demand and have largely ignored the impact of managerial incentives on cost behavior. Although Anderson et al. (2003: 49) conjecture that part of SG&A cost asymmetry may be attributable to agency costs, there is no large-scale empirical evidence on their conjecture. Drawing on the empire building and the downsizing literatures, we fill the gap in the cost stickiness literature by examining the following two research questions: (i) Is SG&A cost asymmetry positively associated with the agency problem, after controlling for known economic determinants of this asymmetry? (ii) Does strong corporate governance mitigate any positive association between the agency problem and SG&A cost asymmetry?

Agency theory predicts that the misalignment of interests between shareholders and managers could lead to agency problems, that is, managers engage in activities for their own benefits rather than the benefits of the firm's shareholders (Jensen and Meckling 1976). A well-documented agency problem is managerial "empire building", which refers to managers' tendencies to grow the firm beyond its optimal size or to maintain unutilized

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resources with the purpose of increasing personal utility from status, power, compensation, and prestige (Jensen 1986; Stulz 1990; Masulis, Wang, and Xie 2007; Hope and Thomas 2008). For example, in his seminal paper on managers' utility-maximizing tendencies, Williamson (1963) specifically uses the expansion of staff (proxied by SG&A costs) beyond optimal levels as an example to illustrate the effects of managerial discretion on managers' opportunistic behavior.[1] Despite the relevance of SG&A costs to the empire building literature, empirical work in this literature has focused on more salient, infrequent activities such as mergers and acquisitions (e.g., Titman, Wei, and Xie 2004; Dittmar and Mahrt-Smith 2007; Masulis et al. 2007) while ignoring less salient, ongoing activities such as SG&A expenditures. Because SG&A costs capture most of the overhead costs incurred in the corporate offices (such as salespersons' salaries and commissions, office payroll and expenses, travel and entertainment), empire building managers are likely to increase SG&A costs too rapidly (e.g., adding office payroll and expenses too quickly) when sales go up or to decrease SG&A costs too slowly (e.g., delaying the reduction of office payroll and expenses) when sales go down. Such behavior will shift SG&A cost asymmetry away from its optimal level and result in greater SG&A cost asymmetry than dictated by economic factors. This implies a positive relation between the agency problem and the degree of SG&A cost asymmetry, that is, the stronger the empire building incentives, the greater the SG&A cost asymmetry and thus the larger the shift of SG&A costs from their optimal levels.[2]

Moreover, the economics and management literatures have also drawn on agency theory to posit that managers have disincentives to downsize because: (i) managers derive monetary and nonmonetary benefits from managing larger and more complex organizations, (ii) any benefits from downsizing accrue primarily to shareholders rather than managers, and (iii) managers may prefer the quiet life and try to avoid the difficult decisions and costly efforts associated with downsizing (Bertrand and Mullainathan 2003; see Datta, Guthrie, Basuil, and Pandey 2010 for a review). While the downsizing literature does not focus exclusively on SG&A costs, it examines factors that underpin SG&A costs, for example, head counts in corporate offices. In particular, this literature suggests that many downsizings target management and white-collar staff rather than the firm's productive core because slack resources are most likely to be found in the former. Researchers in the downsizing literature have used SG&A costs as the primary proxy for slack resources channeled into overhead and staff expenses (e.g., Bourgeois 1981; Singh 1986; Wiseman and Bromiley 1996). To the extent that SG&A costs capture a large portion of the organizational slack that managers should otherwise cut in response to demand declines (e.g., office payroll and expenses), managers' disincentives to downsize will result in greater SG&A cost asymmetry. Therefore, drawing on the empire building and the downsizing literatures, we predict that the agency problem shifts SG&A cost asymmetry from its

1. "Expansion of staff is an activity that offers positive rewards, the benefits of which can be enjoyed quite generally. Indeed, since promotional opportunities within a fixed-size firm are limited, while increased jurisdiction has the same general effect as promotion but simultaneously produces the chance of advance for all, the incentive to expand staff may be difficult to resist. Not only is it an indirect means to the attainment of salary, but it is a source of security, power, status, prestige, and professional achievement as well" (Williamson 1963: 1034).
2. Anecdotal evidence also supports the tendency of managers to overspend on SG&A costs without legitimate economic reasons (Lazere 1997; White and Dieckman 2005; Wilson 2000). For example, White and Dieckman (2005: 23) find no correlation between hypothesized SG&A drivers (e.g., business and product complexity, geographic footprint, number of products, business size, and channel strategy) and actual SG&A spending, but instead find a strong positive correlation between gross margin and SG&A spending, suggesting that "companies appear to spend more if they have more to spend".

optimal level, resulting in a positive association between the agency problem and SG&A cost asymmetry after controlling for legitimate economic reasons.

Our second research question examines the role of corporate governance in mitigating the effect of the agency problem on SG&A cost asymmetry. Corporate governance is expected to alleviate the agency problem and restrain managers' incentives to further their own interests at the expense of the shareholders (Shleifer and Vishny 1997). If retaining SG&A costs is not dictated by economic circumstances, effective monitoring should discourage managers from increasing SG&A costs excessively in response to demand increases and encourage managers to eliminate slack in SG&A costs in response to demand decreases. Both the empire building and the downsizing literatures provide empirical evidence consistent with the monitoring role of corporate governance. For example, the empire building literature suggests that takeover threats reduce managers' empire building behavior through overspending in capital expenditure (Titman et al. 2004) or acquisitions (Masulis et al. 2007). In the downsizing literature, it has been argued that managers are more likely to downsize in response to performance declines in the presence of a more independent board (Perry and Shivdasani 2005), a larger percentage of institutional shareholders (Bethel and Liebeskind 1993), or an effective external control market (Denis and Shome 2005). These findings have implications for our setting. Specifically, we expect strong corporate governance to help bring the degree of SG&A cost asymmetry closer to the optimal level. Therefore, we hypothesize that the adverse effects of the agency problem on SG&A cost stickiness should be less pronounced under strong corporate governance.

To test our predictions, we analyze financial and governance data over the period 1996–2005 for firms in the S&P 1500 index. We use four variables to capture managers' empire building incentives arising from the agency problem: free cash flow (FCF), chief executive officer (CEO) horizon, tenure, and compensation structure. Consistent with our first prediction, we find that cost asymmetry increases with managers' empire building incentives due to the agency problem, after controlling for known economic determinants of cost asymmetry. Specifically, we find that cost asymmetry increases with free cash flow.[3] We also find that cost asymmetry decreases in years of CEO change or immediately preceding a CEO change, and that cost asymmetry increases with CEO tenure and the percentage of at-risk pay in the CEO's total compensation. These results provide strong support for our argument that the agency problem complements legitimate economic factors in explaining cross-sectional variations in SG&A cost asymmetry.

To address our second research question, we construct two corporate governance factors out of six key corporate governance variables and use these factors to split our sample into two subsamples based on the strength of corporate governance (above and below median factor score using each factor). As predicted, we find that the positive association between the agency problem and SG&A cost asymmetry becomes less pronounced in the strong governance subsamples compared with the weak governance subsamples, suggesting that strong corporate governance mitigates the effects of the agency problem on SG&A cost asymmetry.

We conduct additional analyses to provide more direct evidence on whether the agency problem shifts SG&A cost asymmetry from its optimal level. To the extent that some SG&A costs create long-term value (Anderson, Banker, Huang, and Janakiraman 2007; Banker et al. 2011), a certain level of SG&A cost asymmetry may be desirable. Building on the Banker et al. 2011 results on the long-term value created by SG&A expenditures, we predict that in firms where SG&A costs create lower future value, SG&A cost stickiness should be influenced more by agency factors than by economic considerations.

3. This result is robust after we control for the endogeneity of free cash flow.

We partition our sample based on the long-term value creation potential (high vs. low) of SG&A costs and compare the coefficients on the agency-related variables across the two subsamples. We find a lower degree of cost stickiness when SG&A costs have low value-creation potential than when SG&A costs have high value-creation potential. However, we also find that, as predicted, the agency problem influences cost stickiness to a greater extent in firms where SG&A costs create lower long-term value compared to firms where SG&A costs create higher long-term value. Consistent with the suboptimal level of cost stickiness, we find that return on equity (ROE) in year $t + 1$ is significantly lower for the Low Value Creation subsample than for the High Value Creation subsample, even though ROEs in years $t-1$ and t are not significantly different between the two subsamples. These results provide further evidence that the agency problem shifts cost asymmetry from its optimal level.

Finally, the empire building and downsizing arguments should be more applicable to mature, stable firms than to young, growth firms because mature firms tend to have more slack resources channeled into SG&A costs (Sharfman, Wolf, Chase, and Tansik 1988). We partition our sample based on the life cycle stage of each firm-year and compare the coefficients on the agency-related variables across the two subsamples. Consistent with our prediction, we find that the agency problem affects cost stickiness to a greater extent in mature firms than in growth firms.

Collectively, our findings suggest that the agency problem provides an important explanation for SG&A cost asymmetry, particularly among those firms with weak corporate governance, firms in which SG&A costs create low future value, and mature firms. Our study makes several contributions to the literature. First, prior studies on cost stickiness have largely ignored the impact of managerial incentives. We fill the gap in the cost stickiness literature by showing that, in addition to economic factors, agency factors also motivate managers' cost adjustment decisions and thus help explain SG&A cost behavior. More importantly, we provide evidence that the agency problem shifts SG&A cost stickiness away from its optimal level. Second, we contribute to the FCF literature by documenting a strong positive association between free cash flow and SG&A cost asymmetry. Although SG&A costs capture most of the slack resources channeled into overhead and staff expenses and thus represent an important aspect of managerial empire building, previous studies on FCF and empire building behavior have focused on more salient, infrequent activities such as mergers and acquisitions or capital expenditures. We complement those studies by showing that the empire building problem can also be manifested in SG&A cost behavior. Third, our study adds to a stream of empirical studies that examine the effectiveness of corporate governance in mitigating the agency problem.

The remainder of the paper is organized into four sections. In section 2, we develop our hypotheses. In section 3, we discuss the sample and measures used in the analyses. Section 4 presents the empirical results and section 5 concludes.

2. Hypotheses development

SG&A cost asymmetry and the agency problem

As discussed in the introduction, prior studies on SG&A cost asymmetry have largely ignored the impact of the agency problem on cost behavior. We draw on the empire building and the downsizing literatures to predict a positive association between the agency problem and SG&A cost asymmetry. In the following subsections, we develop hypotheses for specific measures of the agency problem. We follow the literature in accounting and corporate finance and use FCF, CEO tenure, CEO horizon, and CEO compensation to proxy for managers' empire building incentives due to the agency problem.

FCF

FCF is a commonly used proxy for the agency problem and the resulting empire building incentives (Jensen 1986; Masulis et al. 2007; Richardson 2006; Stulz 1990; Shleifer and Vishny 1997; Titman et al. 2004). Defined as cash in excess of that required to fund all available positive NPV projects, FCF arises when there is a mismatch between available cash and growth prospects (Jensen 1986). The FCF hypothesis proposed by Jensen 1986 suggests that managers with high levels of FCF are likely to invest it in operations or negative net present value projects instead of paying it out to shareholders in order to increase perquisites consumption. Much empirical evidence supports Jensen's FCF hypothesis. For example, Lang, Stulz, and Walking (1991) examine a sample of successful tender offers and find a negative relationship between FCF and bidder returns. Gibbs (1993) finds that financial and portfolio restructurings are influenced by the agency costs of FCF. Recently, Richardson (2006) finds systematic evidence for the overinvestment of FCF. Applying the insights from these studies to managers' SG&A decisions, we predict that when FCF is high, managers have greater opportunity for overinvesting in operational costs such as SG&A in response to an increase in output demand and delaying the cutting of SG&A costs in response to a decrease in output demand, leading to greater SG&A cost asymmetry. By contrast, when FCF is low, managers have less opportunity for empire building and they are more likely to reduce SG&A costs in response to demand decreases in order to avoid negative career consequences. The above discussion leads to our first hypothesis:

HYPOTHESIS 1a. *The degree of SG&A cost asymmetry is positively associated with a firm's FCF after controlling for known economic determinants of the asymmetry.*

CEO tenure

Another factor that influences managers' empire building incentives is CEO tenure. CEOs with long tenures are more likely to be entrenched in their positions because they have had more time to build coalitions and accumulate power. As a result, they tend to have more control over the board and other internal monitoring mechanisms and are more likely to pursue their own interests rather than the shareholders' interests. For example, Hill and Phan (1991) find that the relationship between firm size and pay strengthens as CEO tenure increases, suggesting that longer-tenure CEOs have more power to structure their compensation packages to enhance their own interests. Berger, Ofek, and Yermack (1997) use CEO tenure as a proxy for managerial entrenchment and find evidence that after controlling for nonagency determinants of leverage, firms have significantly lower leverage when the CEOs are more entrenched. In general, managers are motivated to empire build in the hope of increasing their prestige and compensation through the increase in firm size. Therefore, CEOs with longer tenures should have greater empire building incentives because they are more likely to enjoy higher compensation when firm size increases. Thus, we predict that as tenure increases, managerial empire building incentives increase, which, in turn, leads to greater SG&A cost asymmetry.

HYPOTHESIS 1b. *The degree of SG&A cost asymmetry is positively associated with CEO tenure, after controlling for known economic determinants of the asymmetry.*

CEO horizon

Managers are motivated to empire build because they expect to obtain greater prestige and higher compensation if they increase firm size (Murphy 1985; Jensen and Murphy

1990; Rose and Shepard 1997). Because the expected cumulative benefits such as prestige and compensation increase with a manager's horizon (i.e., the number of years the manager expects to remain in office), a manager's empire building incentives should increase with horizon. For managers who approach retirement or expect to leave their firms within a short period of time, the expected benefits from empire building will accrue to their successors rather than to themselves, which should reduce their empire building incentives. Consistent with this, Dechow and Sloan (1991) find that CEOs spend less on R&D expenditures during their final years in office. Therefore, we expect CEOs who are in their final years of service (i.e., face a short horizon) to be less likely to empire build and more likely to cut SG&A costs when necessary, leading to a lower degree of cost asymmetry. The above discussion leads to the following hypothesis:

HYPOTHESIS 1c. *The degree of SG&A cost asymmetry is positively associated with CEO horizon (i.e., cost asymmetry decreases in the year of or in the year immediately preceding CEO change), after controlling for known economic determinants of the asymmetry.*

CEO compensation

The structure of managers' compensation schemes also affects their empire building incentives. There are mixed arguments and empirical evidence on the effects of CEO compensation schemes. Some studies find that more variable pay leads to greater alignment of incentives and triggers lower incentives to empire build, but other studies find that variable pay may be a way managers extract rent from the company (see Hanlon, Rajgopal, and Shevlin 2003 for a discussion of the debate). In our paper, we focus specifically on the effect of CEO compensation on managers' empire building behavior, which likely differs from other types of behavior driven by agency costs. We draw on Kanniainen's 2000 analytical work that specifically examines the effect of executive compensation structure on empire building. Kanniainen (2000) finds that, under assumptions of decreasing absolute risk aversion and decreasing preference for prudence, a manager's empire building incentives are attenuated when his/her compensation is hedged by a fixed income. As the proportion of fixed income in a manager's total compensation package decreases, the manager has greater incentives to overinvest under uncertainty because an increase in investment provides managers with an instrument for a precautionary strategy: "By investing, the management saves inside the firm, creating resources to be consumed as private benefits" (Kanniainen 2000: 133). Kanniainen's results suggest that the commonly observed incentive contracts actually create greater incentives for empire building. Drawing on Kanniainen's insights, we predict that when the percentage of at-risk (nonfixed) pay in CEO compensation packages increases, CEOs should have greater empire building incentives, leading to greater cost asymmetry. Conversely, the percentage of fixed compensation in CEOs' total compensation should be negatively associated with cost asymmetry. Consistent with Kanniainen's argument, Banker et al. (2011) find that cash pay is negatively related to change in SG&A costs because firms use cash-based compensation to penalize wasteful spending on SG&A costs. Drawing on Kanniainen 2000 and Banker et al. 2011, we posit the following hypothesis:

HYPOTHESIS 1d. *The degree of SG&A cost asymmetry is negatively associated with the percentage of fixed pay in a CEO's total compensation, after controlling for known economic determinants of the asymmetry.*

The role of corporate governance in reducing the agency problem

Our second research question investigates the role of corporate governance in reducing the agency problem in SG&A cost behavior. Strong corporate governance can mitigate

the agency problem and restrain managers' incentives to further their own interests at the expense of the shareholders (Shleifer and Vishny 1997). Prior research has examined the impact of a variety of corporate governance mechanisms on firm performance and managerial decision making (see Larcker, Richardson, and Tuna 2007 for a review). In particular, empirical evidence supports the effectiveness of corporate governance mechanisms in reducing the agency problem manifested in managers' empire building behavior or unwillingness to downsize. For example, Titman et al. (2004) find a negative association between capital expenditures and subsequent returns, consistent with managers' empire building behavior. However, they find that such behavior did not exist in time periods when hostile takeovers were more prevalent. Masulis et al. (2007) find that managers protected by more anti-takeover provisions are more likely to indulge in value-destroying acquisitions. Gaspar, Massa, and Matos (2005) find that being accountable to long-term shareholders reduces the leeway the managers of the bidder have to engage in questionable acquisitions that are made to enhance private benefits of the managers. Richardson (2006) finds that the presence of activist shareholders mitigates overinvestment of FCF. Bethel and Liebeskind (1993) find that firms with greater blockholder ownership experience higher levels of employee reductions. The downsizing literature also suggests that firms with independent boards are more likely to engage in downsizing (Perry and Shivdasani 2005). Building on the findings from prior studies, we expect strong corporate governance mechanisms to discourage managers from increasing SG&A costs excessively in response to demand increases and to encourage managers to eliminate slack in SG&A costs in response to demand decreases. This leads to our second hypothesis:

HYPOTHESIS 2. *The association between the agency problem and the degree of SG&A cost asymmetry is weaker in firms with stronger corporate governance.*

3. Sample and variable measurement

Sample selection

We obtain data on SG&A costs, sales revenue, and other financial variables from the COMPUSTAT annual industrial files. We obtain the corporate governance variables from ExecuComp (CEO/Chairman separation), RiskMetrics (board size, percentage of independent board members, anti-takeover provisions), and Thomson Financial (percentage of institutional ownership). The RiskMetrics and ExecuComp databases cover S&P 1500 firms, which come from a broad range of representative industries, thus alleviating potential concerns about industry clustering. Because the RiskMetrics data start from 1996, our sample covers the period 1996–2005.[4] The director data are based on board information released after the annual directors' meeting following the corresponding fiscal year. We construct two samples: a base sample and a testing sample. The base sample does not include the agency variables and we use it to compare our results with those reported by Anderson et al. 2003. The testing sample, which is the intersection between the base sample and the agency variables, is used to test our hypotheses.

Table 1 illustrates our sample selection procedures, which closely follow those discussed in Anderson et al. 2003 and Anderson and Lanen 2007. We start with 244,178 firm-year observations in the COMPUSTAT annual industrial files for fiscal years 1995–2005. We require sales and SG&A costs to be available in the current year and the

4. To construct financial variables with lagged values, we use data for the fiscal year 1995 in COMPUSTAT and the Center for Research in Security Prices (CRSP).

TABLE 1
Sample selection procedures

Base Sample:	Number of obs.	Testing Sample:	Number of obs.
(1) Unique observations in COMPUSTAT annual industrial database over fiscal years 1995 to 2005	244,178	(1) Unique observations in COMPUSTAT annual industrial database over fiscal years 1995 to 2005	244,178
(2) Drop observations with missing data on SG&A costs and sales revenue for the current year and the previous year and observations for which sales revenue is smaller than SG&A costs	67,213	(2) Drop observations with missing data on SG&A costs and sales revenue for the current year and the previous year and observations for which sales revenue is smaller than SG&A costs	67,213
(3) Trim top and bottom 0.5 percent of observations with extreme values in the change of SG&A costs and the change of sales revenue	66,632	(3) Merge the COMPUSTAT data with variables from ExecuComp, RiskMetrics, and Thomson Financial	10,167
(4) Drop observations with missing data on economic variables and exclude observations where sales and SG&A costs move in the opposite directions.	51,314	(4) Trim top and bottom 0.5 percent of the observations with extreme values in the change of SG&A costs and the change of sales revenue	10,012
		(5) Drop observations with missing data on corporate governance, economic, and management incentive variables	6,418
		(6) Exclude observations where sales and SG&A costs move in the opposite directions.	5,278

Note:

We extract relevant data from COMPUSTAT, ExecuComp, RiskMetrics, and Thomson Financial databases over the period 1995–2005. The base sample is used to compare our results with those reported in Anderson et al. 2003. The testing sample is used to test our hypotheses. The RiskMetrics and ExecuComp databases cover S&P 1500 firms (active and inactive). SG&A and sales revenue are COMPUSTAT items 189 and 12, respectively.

previous year in the sample period, and we also require SG&A costs to be smaller than sales. These criteria result in a sample of 67,213 firm-year observations. Next, we trim the top and the bottom 0.5 percent of the observations with extreme values in the change of SG&A costs and change of sales revenue, resulting in 66,632 observations. Finally, we follow Anderson and Lanen's 2007 suggestion and exclude observations where SG&A costs move in the opposite direction of sales (i.e., SG&A *increases* following sales *declines* or SG&A decreases following sales *increases*).[5] This results in a base sample of 51,314 observations.

We obtain our testing sample by combining the COMPUSTAT variables (before the trimming) with variables from ExecuComp and Thomson Financial. The merging of these databases yields 10,167 observations. We then trim the top and the bottom 0.5 percent of the observations with extreme values in SG&A changes and sales changes. This results in 10,012 observations. Next, we drop observations with missing data on agency, economic, and corporate governance variables, resulting in a sample of 6,418 observations. Finally, we follow Anderson and Lanen's 2007 suggestion and exclude observations where SG&A costs move in the opposite direction of sales and obtain a final testing sample of 5,278 firm-year observations.

Agency variables

We use four variables to capture managers' empire building incentives due to the agency problem: *FCF, CEO Tenure*, *CEO Horizon*, and *CEO Fixed Pay*. *FCF* is measured as cash flow from operating activities (data item 308) minus common and preferred dividends (data items 21 and 19) scaled by total assets (data item 6) (Lang et al. 1991; Core and Guay 1999). *CEO Tenure* is the number of years that the CEO has been in office. *CEO Horizon* is an indicator variable that is defined as one if it is a year of CEO change or a year immediately preceding a CEO change and zero otherwise. *CEO Fixed Pay* is the ratio of salary plus bonus divided by total compensation during year t, where total compensation consists of salary, bonus, value of restricted stocks and options, and all other annual payouts. Following prior literature (e.g., Jensen and Murphy 1990), we use salary and bonus to proxy for fixed pay because both have extremely low sensitivity to changes in firm value.

Economic variables

We control for known economic determinants of SG&A cost asymmetry in our tests. First, we control for employee intensity and asset intensity (Anderson et al. 2003). *Employee Intensity* is calculated as the ratio of the total number of employees to sales revenue, and *Asset Intensity* is calculated as the ratio of total assets to sales revenue. Second, we control for successive revenue decreases because managers are more likely to consider a negative demand shock to be permanent when there are revenue decreases in two consecutive years. *Successive Decrease* is an indicator variable that takes the value of one if sales revenues in year $t-1$ are less than those in year $t-2$ and zero otherwise. We also control for *Stock Performance*, measured by the raw stock returns in the year prior to the annual board meeting. The relation between stock performance and cost asymmetry is ambiguous. Firms with good stock performance may be more efficient in cutting unutilized resources, resulting in a negative relation between stock performance and cost asymmetry. However, good stock performance may signal positive expectations about the firm's future earnings,

5. Anderson and Lanen (2007) argue that cost stickiness is conditional on the assumption that costs move in the same direction as activities ($\beta_1 > 0$). In our raw sample, SG&A costs for about 8 percent of the observations in our entire sample decrease following a sales increase, while SG&A costs for about 9 percent of the observations in our entire sample increase following a sales decrease.

which may lead managers to deliberately retain some unnecessary SG&A costs, resulting in a greater degree of cost asymmetry. Therefore, we do not make a directional prediction about the relationship between the firm's stock market performance and the magnitude of cost asymmetry.

Corporate governance variables

We examine six well-documented governance variables. We briefly discuss each of these governance variables below.

Board size

Larger boards benefit a company by increasing the pool of expertise and resources available to firm management (Lorsch and Maclver 1989; Goodstein, Gautam, and Boeker 1994), but potentially suffer from greater social loafing and more difficult coordination among board members (Jensen 1993). Some studies find that firms with larger boards perform better (e.g., Adams and Mehran 2005), but the majority of prior studies find evidence favoring smaller boards (e.g., Yermack 1996). Thus, we expect board size to decrease corporate governance quality. *Board Size* is measured as the total number of directors on the board.

Board independence

Boards that are more independent are expected to have incentives better aligned with those of the shareholders. Prior literature has shown that board independence is positively associated with firm value (e.g., Weisbach 1988; Byrd and Hickman 1992; Brickley, Coles, and Terry 1994; Dechow, Sloan, and Sweeney 1996; Core, Holthausen, and Larcker 1999) and negatively associated with financial fraud and earnings management (e.g., Beasley 1996; Dechow et al. 1996; Klein 2002). We measure *Board Independence* with two variables: (i) *The Percentage of Independent Directors*, which is calculated as the number of outside directors divided by the total number of directors and (ii) *CEO/Chairman Separation*, an indicator variable that is equal to one if the CEO and the chairman of the board are not the same person and zero otherwise.

Institutional shareholders

Prior research has generally shown that institutional shareholders are better and more active monitors of managerial behavior than individual investors (e.g., Shleifer and Vishny 1986; Bushee 1998; Atiase, Mayew, and Xue 2006). We measure *Percentage Institutional Ownership* as the number of shares held by institutional investors divided by the total shares outstanding at the end of the quarter closest to the date of the annual board meeting.

Anti-takeover provisions

Both the empire building and the downsizing literatures document the role of the market for corporate control in reducing the agency problem and encouraging managers to take actions that increase the efficiency of the firm. By substantially delaying the process and making a hostile acquisition more difficult, anti-takeover provisions decrease the probability of a successful takeover and hence undermine the ability of the market for corporate control to motivate managers to maximize current shareholder wealth. Prior studies provide ample empirical evidence supporting this argument (e.g., Titman et al. 2004; Masulis et al. 2007; Dittmar and Mahrt-Smith 2007). Following prior studies, we measure *Anti-takeover Provisions* with two proxies: (i) *BCF Anti-takeover Index*, which is created based on six provisions: staggered boards, limits to shareholder bylaw amendments, limits to shareholder charter amendments, supermajority requirements for mergers, poison pills,

and golden parachutes (Bebchuk, Cohen, and Ferrell 2009) and (ii) *Staggered Board*, which is an indicator variable that captures whether the board is staggered (coded as one) or unitary (coded as zero).[6] Because anti-takeover provisions undermine the monitoring role of an external control market, corporate governance quality is a decreasing function of both of these anti-takeover measures.

The prior literature on corporate governance suggests that different corporate governance mechanisms work simultaneously, so we conduct principal component analysis to reduce the dimensionality of our governance variables. We present details on this in section 4 below.

4. Empirical results

Descriptive statistics

Panel A of Table 2 provides descriptive statistics on annual revenues and SG&A costs for our testing sample. On average, our sample firms have $5,383 million in annual sales revenue (median = $1,433 million) and $1,029 million in SG&A costs (median = $276 million). The mean value of SG&A costs as a percentage of sales revenue is 23.79 percent (median = 21.34 percent). These statistics are comparable to those reported in Anderson et al. 2003. Panel B of Table 2 provides descriptive statistics on the economic variables. On average, the sample firms use 6.21 (median = 4.86) employees and $1.13 million (mean = 0.93) of assets to support each million dollars in sales revenue. The median firm has not experienced two consecutive years of sales decreases in the past two years (median = 0, mean = 0.23), and the average raw stock return in the year prior to the annual board meeting is 0.19 (median = 0.12).

Panel C of Table 2 provides descriptive statistics on the agency variables. On average, free cash flow accounts for 10 percent of total assets (median = 9 percent) for our sample firms. The average CEO in our sample firms has been in office for 7.25 years (median = 5). Only 17 percent of our observations come from years of CEO changes or immediately preceding CEO changes. On average, salary and bonus account for 49 percent of total CEO compensation in our sample (median = 44 percent). Panel D of Table 2 provides descriptive statistics on the corporate governance variables. The median board in our sample has 9 members, and the majority of the boards do not have separate chairmen and CEOs (*CEO/Chairman Separation* median = 0, mean = 0.37). On average, 65.65 percent of the board members are outsiders (*% independent directors,* median = 66.67 percent). The average percentage of institutional ownership is 65.53 percent (median = 67.52 percent). The average BCF Anti-takeover Index is 1.59 (median = 2), indicating that the average firm has one to two anti-takeover provisions. The majority of firms in our testing sample have staggered boards (median = 1, mean = 0.61). These statistics are comparable to those documented in the prior literature (e.g., Bhojraj and Sengupta 2003; Core et al. 1999; Larcker et al. 2007).

Table 3 provides Spearman and Pearson correlations between our main variables. The majority of the correlations are significant but small in magnitude. For all the models that we estimate, we conduct multicollinearity diagnostic tests for all the independent variables in the models, including the interaction terms with demeaned continuous variables (Belsley, Kuh, and Welsch 1980; Greene 2003). We find that the tolerance, defined as the inverse of variance inflation factor (1/VIF), is higher than 0.1 for all the variables, suggesting that multicollinearity is not a concern in the estimation of our models.

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6. In firms with staggered boards, directors are categorized into classes. Only one class of directors stands for election at the shareholders' annual meeting. Typically, a staggered board has three classes of directors, so a rival team has to win two elections to gain control of the firm (Bebchuk and Cohen 2005).

TABLE 2
Descriptive statistics

	Mean	Median	Std Dev
Panel A: Revenue and SG&A costs			
Sales Revenue ($mil)	5,383	1,433	15,562
SG&A Costs ($mil)	1,029	276	2,628
SG&A as % of Revenue	23.79	21.34	14.93
Panel B: Economic variables			
Employee Intensity	6.21	4.86	7.46
Asset Intensity	1.13	0.93	0.85
Successive Decrease (indicator)	0.23	0	0.42
Stock Performance	0.19	0.12	0.62
Panel C: Agency variables			
Free Cash Flow (FCF)	0.10	0.09	0.08
Tenure	7.25	5	7.90
Horizon	0.17	0	0.37
FixedPay	0.49	0.44	0.28
Panel D: Governance variables			
Board Size	9.15	9.00	2.52
CEO/Chairman Separation	0.37	0	0.48
% Independent Directors	65.65	66.67	18.02
% Institutional Ownership	65.53	67.52	17.98
BCF Anti-takeover Index	1.59	2	1.06
Staggered Board	0.61	1	0.49

Note:

This table presents the descriptive statistics for testing sample. Panel A describes the distribution of sales revenue and SG&A costs for the firms in the base and testing samples. *Sales Revenue* and *SG&A Costs* are total sales revenue and selling, general, and administration expenses reported in COMPUSTAT annual database (data items 12 and 189, respectively). Panels B, C, and D present the descriptive statistics of economic, agency, and governance variables, respectively: *Employee Intensity* is the number of employees divided by total sales revenue; *Asset Intensity* is total assets (data item 6) divided by sales revenue; *Successive Decrease* is an indicator variable that is equal to 1 if revenue in year $t-1$ is less than revenue in $t-2$, and 0 otherwise; *Stock Performance* is the raw stock return (from CRSP) in the year prior to the annual board meeting; *Free Cash Flow (FCF)* is measured as cash flow from operating activities (data item 308) – Common and preferred dividends (data items 21 and 19) scaled by total assets (data item 6); *Tenure* is the number of years that the CEO has been in office; *Horizon* is an indicator variable, defined as 1 if it is the year of CEO change or the year immediately preceding CEO change, 0 otherwise; *FixedPay* is the ratio of salary plus bonus divided by total compensation during the year; *Board Size* is the total number of members on the board of directors; *CEO/Chairman Separation* is an indicator variable that is equal to 1 if the CEO and the chairman of the board are not the same person, and 0 otherwise; *%Independent Directors* is the percentage of independent (outside) directors on the board; *%Institutional Ownership* is the number of shares held by institutional investors divided by the total shares outstanding at the end of the quarter closest to the date of the annual board meeting; *BCF Anti-takeover Index* is created based on six provisions: staggered boards, limits to shareholder bylaw amendments, limits to shareholder charter amendments, supermajority requirements for mergers, poison pills, and golden parachutes; *Staggered Board* is an indicator variable indicating whether the board is staggered (1) or unitary (0).

TABLE 3
Correlation matrix

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11
V1: SalesRatio		−0.037	0.001	−0.196	0.264	0.057	−0.038	0.062	−0.016	−0.085	0.043
V2: Employee Intensity	−0.099		−0.083	0.004	0.007	0.055	0.011	0.063	0.051	0.004	−0.037
V3: Asset Intensity	0.015	−0.123		0.081	−0.001	−0.065	−0.023	−0.011	−0.154	−0.074	0.063
V4: Successive Decrease	−0.238	0.009	0.110		−0.079	−0.117	0.021	−0.056	0.026	0.032	0.002
V5: Stock Performance	0.328	−0.052	−0.067	−0.122		0.106	−0.031	0.029	−0.035	−0.044	0.018
V6: Free Cash Flow	0.086	0.022	−0.077	−0.123	0.153		−0.025	0.010	−0.065	−0.108	0.056
V7: Horizon	−0.054	0.034	−0.028	0.021	−0.050	−0.027		0.060	0.042	0.031	−0.018
V8: Tenure	0.124	0.060	−0.037	−0.082	0.049	0.017	0.086		0.171	−0.082	−0.032
V9: FixedPay	−0.029	0.148	−0.195	0.027	−0.009	−0.070	0.036	0.126		−0.025	−0.187
V10: Governance Factor 1	−0.104	−0.013	−0.081	0.033	−0.020	−0.105	0.031	−0.084	−0.011		0
V11: Governance Factor2	0.031	−0.120	0.101	0.011	0.054	0.040	−0.018	0.026	−0.172	−0.018	

Note:

This table presents pooled Spearman and Pearson correlations between the variables. *SalesRatio* is the logarithm of the ratio of sales revenue of year t to that of year $t-1$. The two corporate governance factors are explained in panel A of Table 6. Other variables are defined in Table 2. Pearson (Spearman) correlations are presented in the upper (lower) diagonal.

Documentation of cost asymmetry

We estimate the following regression to replicate the SG&A cost asymmetry phenomenon documented in previous studies:

$$\log\left(\frac{SG\ \&\ A_{i,t}}{SG\ \&\ A_{i,t-1}}\right) = \beta_0 + \beta_1 \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \beta_2 DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \sum_{m=3}^{6} \beta_m DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) \cdot EconVar_{m,i,t} + \sum_{s=7}^{10} EconVar_{s,i,t} + \varepsilon_{i,t} \quad (1)$$

where $SG\&A_{i,t}$ and $Sales_{i,t}$ are selling, general, and administrative costs (COMPUSTAT data item 189) and sales revenue (COMPUSTAT data item 12), respectively, for firm i at year t. *DecDummy* takes the value of one when sales revenues in year t are less than those in year $t-1$ and zero otherwise. Coefficient β_1 measures the percentage increase in SG&A costs with a 1 percent increase in sales revenue. *EconVar* stands for the four economic determinants as control variables: *Employee Intensity, Asset Intensity, Successive Performance*, and *Stock Performance* (defined in section 3 above). Continuous variables used in the interaction terms are mean-centered before they are included in the analysis to mitigate multicollinearity as well as to facilitate the interpretation of the main effects (Aiken and West 1991).

Because the value of *DecDummy* is one when revenue decreases, the sum of the coefficients ($\beta_1 + \beta_2$) measures the percentage decrease in SG&A costs with a 1 percent decrease in sales revenue. A significantly positive coefficient β_1 and a significantly negative coefficient

β_2 would be consistent with cost asymmetry. We estimate the asymmetrical adjustment of SG&A costs at the firm level with (1) based on firm-clustered standard errors (Petersen 2009). We include year dummies in all regression models. To support cost asymmetry, β_1 in (1) needs to be significantly positive and β_2 needs to be significantly negative. The results are shown in Table 4. The estimated value of β_1 is 0.746 (t = 118.48) for the base sample and 0.772 (t = 38.56) for the testing sample. This indicates that SG&A costs increase by about 0.75 percent (0.77 percent for the testing sample) per 1 percent increase in sales revenue. The estimated value of β_2 is −0.044 (t = −2.92) for the base sample and −0.082 (t = −1.79) for the testing sample. The combined value of $\beta_1 + \beta_2$ = 0.70 (0.69 for the testing sample) indicates that SG&A costs decrease by about 0.70 percent (0.69 percent for the testing sample) per 1 percent decrease in sales revenue. These results indicate that SG&A cost asymmetry is robust in both the base and testing samples.

The coefficients on the economic variable interaction terms are largely consistent with the prior literature. The significantly negative coefficient on *Asset Intensity* (−0.055 and −0.154 for the base sample and testing sample, respectively) suggests a greater degree of SG&A cost asymmetry in firms that require relatively more assets to support their

TABLE 4
Regressing annual changes in SG&A costs on annual changes in sales revenue for the sample period 1996–2005

		Base Sample		Testing Sample	
	Pred. sign	Coefficient	t-stat	Coefficient	t-stat
Intercept		0.042	21.75***	0.019	4.05***
Sales Change	+	0.746	118.48***	0.772	38.56***
*DecDummy*Sales Change*	−	−0.044	−2.92***	−0.082	−1.79**
Interaction Terms: (Variable*DecDummy*Sales Change):					
Employee Intensity	+	0.035	3.53***	0.058	1.94**
Asset Intensity	−	−0.055	−5.43***	−0.154	−4.93***
Successive Decrease	+	0.027	1.59*	0.046	0.88
Stock Performance	?	−0.0001	−16.75***	0.020	0.56
Standalone Variables:					
Employee Intensity		0.008	7.45***	0.010	3.78***
Asset Intensity		0.007	10.45***	−0.001	−0.27
Successive Decrease		−0.049	−24.56***	−0.025	−6.06***
Stock Performance		−0.001	−23.86***	−0.005	−1.84**
Year Dummies		Suppressed			
N		51,314		5,278	
Adjusted R^2		66.13%		65.79%	

Note:

This table presents the regression results from (1). See Table 2 for variable definitions. The coefficient estimates are based on firm clustered standard errors (Petersen 2009). *, **, and *** denote significance at levels of 0.1, 0.05, and 0.01 using one-tailed tests, respectively.

$$\log\left(\frac{SG\ \&\ A_{i,t}}{SG\ \&\ A_{i,t-1}}\right) = \beta_0 + \beta_1 \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \beta_2 DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \sum_{m=3}^{6} \beta_m DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) \cdot EconVar_{m,i,t} + \sum_{s=7}^{10} EconVar_{s,i,t} + \varepsilon_{i,t} \quad (1)$$

activities. The coefficient on *Successive Decrease* is significantly positive (0.027, $t = 1.59$) in the base sample, suggesting a lower degree of SG&A cost asymmetry in firms experiencing negative demand shocks in two consecutive years. The significantly negative coefficient on *Stock Performance* (−0.0001, $t = -16.75$) in the base sample suggests that the degree of SG&A cost asymmetry is higher in firms with strong stock performance. However, unlike Anderson et al. 2003, we find a significantly positive coefficient on *Employee Intensity* in both samples (0.035 and 0.058, respectively), suggesting a lower degree of SG&A cost asymmetry in firms that require relatively more employees to support operations. We conjecture that this inconsistency is due to the difference in the samples used in our study and the Anderson et al. 2003 study.[7]

The agency problem and cost asymmetry

Hypotheses 1a through 1d predict that the severity of the agency problem is positively associated with the degree of cost asymmetry after controlling for economic determinants. Thus, the coefficient for the interaction term β_2 in (1) can be expressed as a function of the agency problem as well as economic variables. We expand (1) to test Hypotheses 1a through 1d with the following model:

$$\begin{aligned}\log\left(\frac{SG\ \&\ A_{i,t}}{SG\ \&\ A_{i,t-1}}\right) = \beta_0 + \beta_1 \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \beta_2 DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) \\ + \sum_{m=3}^{6} \beta_m DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) \cdot AgencyVar_{m,i,t} \\ + \sum_{p=7}^{10} \beta_p DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) \cdot EconVar_{p,i,t} \\ + \sum_{q=11}^{14} \beta_q AgencyVar_{q,i,t} + \sum_{s=15}^{18} \beta_s EconVar_{s,i,t} + \varepsilon_{i,t} \qquad (2)\end{aligned}$$

where *AgencyVar* stands for the four agency variables: *FCF, CEO Tenure*, *CEO Horizon*, and *CEO Compensation* (defined in section 3 above) and *EconVar* stands for the four economic determinants as control variables: *Employee Intensity, Asset Intensity, Successive Performance*, and *Stock Performance* (defined in section 3 above). Continuous variables used in the interaction terms are mean-centered before they are included in the analysis to mitigate multicollinearity as well as to facilitate the interpretation of the main effects (Aiken and West 1991).

As in (1), where the degree of cost asymmetry increases with the magnitude of the negative value of β_2, the degree of cost asymmetry increases (decreases) with the magnitude of the negative (positive) values of β_m and β_p in (2). Columns 2 and 3 of Table 5 present the results from estimating (2). The coefficients and *t*-statistics reported are based on firm-clustered standard errors, which address the heteroskedasticity and intrafirm error correlation problems associated with panel data. Similar to the estimation results of (1), we find that β_1 is significantly positive ($\beta_1 = 0.770$, $t = 38.77$). However, the inclusion of the agency variables in (2) renders β_2 insignificant ($\beta_2 = -0.062$, $t = -1.13$),[8] suggesting that the

7. While the Anderson et al. (2003) sample covers the period from 1979 to 1998, our sample period is from 1995 to 2005. We conjecture that our sample firms, which come from more recent years, may use temporary labor to a greater extent, allowing them to have greater flexibility with their labor costs. Because laying workers off when demand decreases and hiring workers when demand increases should incur less adjustment costs for temporary workers than for permanent workers, to the extent that firms with greater labor intensity in our sample also employ a larger percentage of temporary workers, labor intensity can be negatively associated with cost asymmetry.

8. In general, the degree of cost asymmetry is reduced in the restricted sample which excludes observations where sales and SG&A costs move in opposite directions as compared to the full sample. In the *full* sample, β_2 is significantly negative in (2) for all the analyses we present in Table 5 through Table 8.

TABLE 5

Regressing annual changes in SG&A costs on annual changes in sales revenue and agency and economic determinants of cost stickiness

		FCF		FCF Instrument Variable	
		Coefficient	*t*-stat	Coefficient	*t*-stat
Intercept		0.017	3.55***	0.019	3.76***
Sales Change	+	0.770	38.77***	0.767	38.40***
*DecDummy*Sales Change*	−	−0.062	−1.13	−0.057	−1.04
Interaction Terms: (Variable*DecDummy*Sales Change)					
Free Cash Flow	−	−0.803	−3.50***	−1.096	−4.22***
Tenure	−	−0.004	−1.63*	−0.004	−1.52*
Horizon	+	0.104	1.85**	0.097	1.71**
FixedPay	+	0.155	2.04**	0.144	1.91**
Employee Intensity	+	0.045	1.52*	0.040	1.33*
Asset Intensity	−	−0.115	−3.68***	−0.126	−4.02***
Successive Decrease	+	0.014	0.28	0.044	0.88
Stock Performance	?	0.028	0.76	0.023	0.64
Standalone Variables:					
Free Cash Flow		0.121	5.81***	0.112	4.73***
Tenure		0.0002	1.38*	0.000	1.46*
Horizon		0.003	0.76	0.002	0.65
FixedPay		0.002	0.35	0.001	0.18
Employee Intensity		0.009	3.45***	0.009	3.64***
Asset Intensity		0.001	0.30	0.001	0.19
Successive Decrease		−0.023	−5.48***	−0.023	−5.58***
Stock Performance		−0.007	−2.48***	−0.006	−2.23**
Year Dummies		Suppressed			
N		5,278		5,278	
Adjusted R^2		66.54%		66.44%	

Note:

This table presents the regression results from (2). See Table 2 for variable definitions. The coefficient estimates are based on firm clustered standard errors (Petersen 2009). *, **, and *** denote significance at levels of 0.1, 0.05, and 0.01 using two-tailed tests, respectively.

$$\log\left(\frac{SG\ \&\ A_{i,t}}{SG\ \&\ A_{i,t-1}}\right) = \beta_0 + \beta_1 \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \beta_2 DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \sum_{m=3}^{6} \beta_m DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) \cdot AgencyVar_{m,i,t} + \sum_{p=7}^{10} \beta_p DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) \cdot EconVar_{p,i,t} + \sum_{q=11}^{14} \beta_q AgencyVar_{q,i,t} + \sum_{s=15}^{18} \beta_s EconVar_{s,i,t} + \varepsilon_{i,t} \quad (2)$$

agency and economic variables subsume the effects of sales decreases on SG&A costs. The coefficients of the economic variable interaction terms are largely consistent with the estimates from (1).

Hypothesis 1a predicts that the degree of SG&A cost asymmetry increases with free cash flow. A negative coefficient on the *FCF* interaction term would indicate a greater

degree of cost asymmetry, so we expect the coefficient on the *FCF* interaction term to be negative. As shown in columns 3 and 4 of Table 5, the result is consistent with Hypothesis 1a. The coefficient on the *FCF* interaction term is significantly negative at the 1 percent level with a one-tailed test (coefficient = −0.803, t = −3.50), suggesting that SG&A cost asymmetry increases when FCF is higher. The effect of FCF on cost stickiness is in addition to a significantly positive main effect of FCF (coefficient = 0.121, t = 5.81) on SG&A cost changes.

Hypothesis 1b predicts that the degree of SG&A cost asymmetry increases with CEO tenure. A negative coefficient on the *Tenure* interaction term would indicate a greater degree of cost asymmetry, so we expect the coefficient on the *Tenure* interaction term to be negative. As shown in Table 5, the result is consistent with Hypothesis 1b. The coefficient on the *Tenure* interaction term is significantly negative at the 10 percent level with a one-tailed test (coefficient = −0.004, t = −1.63), indicating that SG&A cost asymmetry is greater when the CEO has been in office for a longer period of time.

Hypothesis 1c predicts that the degree of SG&A cost asymmetry decreases in the year of CEO change or the year immediately preceding a CEO change. Since a positive coefficient on the *Horizon* (an indicator variable that equals 1 in a year of CEO change or a year immediately preceding a CEO change) interaction term would indicate a lower degree of cost asymmetry, we expect the coefficient on the *Horizon* interaction term to be positive. The result reported in Table 5 supports Hypothesis 1c. The coefficient on the *Horizon* interaction term is significantly positive at the 5 percent level with a one-tailed test (coefficient = 0.104, t = 1.85). This result indicates that SG&A cost asymmetry is reduced when the CEO expects to leave within a short period of time.

Hypothesis 1d predicts that the degree of SG&A cost asymmetry decreases with the percentage of fixed pay in a CEO's total compensation. Since a positive coefficient on the *FixedPay* interaction term would indicate a lower degree of cost asymmetry, we expect the coefficient on the *FixedPay* interaction term to be positive. The result in Table 5 supports Hypothesis 1d. The coefficient on the *FixedPay* interaction term is significantly positive at the 5 percent level with a one-tailed test (coefficient = 0.155, t = 2.04), indicating that SG&A cost asymmetry is lower when fixed pay accounts for a larger percentage of a CEO's total compensation.[9]

An important limitation of the estimation of (2) concerns the endogeneity of FCF. We assume that FCF is exogenous in the estimation of (2), but prior literature suggests that FCF can be determined by variables such as firm size, leverage, and investment opportunity (Jensen 1986). To alleviate the endogeneity concern, we first regress *FCF* on the second moment of *FCF* and then use the resulting predicted value of *FCF* in (2) (Lewbel 1997; Banker et al. 2011). Our results are robust to this alternative measure of FCF. Columns 5 and 6 of Table 5 present the estimation of (2) using the instrumental variable

9. A potential endogeneity concern is that CEO compensation structure may be affected by the strength of corporate governance. For example, Cheng and Indjejikian (2009) find that CEO compensation is more sensitive to performance following the enactment of anti-takeover laws. Given the substitute effects between external governance mechanisms and internal incentives, a potential alternative explanation for our results is that a higher percentage of fixed income could be the result of strong corporate governance, and therefore the negative association between the percentage of fixed income and SG&A cost stickiness could be attributed to better corporate governance. To investigate this alternative explanation, we regress *FixedPay* on our two corporate governance factors and use the residual from the regression as an instrumental variable to replace the raw variable *FixedPay* in the estimation of (2). Our results are robust to this instrumental variable. Specifically, all the agency variables have significant coefficients in predicted directions. The coefficients and t-values are as follows: FCF (−0.795, t = 3.46), Horizon (−0.103, t = 1.83), Tenure (−0.004, t = −1.61) and FixedPay (0.157, t = 2.06).

for FCF.[10] An alternative instrumental variable approach is to use industry average FCF (Lev and Sougiannis 1996).[11] Untabulated results indicate that our results are also robust to this alternative instrumental variable for FCF. To sum up, the results reported in Table 5 provide strong support for our argument that the agency problem complements known economic factors in explaining SG&A cost asymmetry.

The effect of corporate governance in mitigating the agency problem

Hypothesis 2 predicts that the positive association between the agency problem and SG&A costs is less pronounced in firms with stronger corporate governance. As we mentioned above, we first conduct principal component analysis to reduce the dimensionality of our governance variables and then we test the hypothesis. This analysis yields two factors which have eigenvalues greater than 1.1 and account for more than half of the sample variance. Panel A of Table 6 presents the results of the principal component factor analysis with Varimax rotation. The variables that load on the first factor include *BCF Anti-takeover Index* and *Staggered Board*, so we label the first factor *Takeover Threat*. The variables that load on the second factor include *Percentage of Independent Directors* and *Percentage of Institutional Ownership*. We label the second factor *Other Governance Variables*. *Board Size* and *CEO/Chairman Separation* do not load significantly on either of the factors. We use factor loadings to construct weighted factor scores for these two corporate governance dimensions and employ them in the tests of Hypothesis 2. A lower score on the *Takeover Threat* factor indicates stronger corporate governance because fewer anti-takeover provisions increase the disciplining role of takeover markets. A higher score on the *Other Governance Variables* factor indicates stronger corporate governance because a larger percentage of institutional shareholders and a larger percentage of independent directors strengthen the monitoring of managers' behavior.

To test Hypothesis 2, we partition our sample into Strong versus Weak Governance subsamples, using the median value of each governance factor to split the sample. We estimate (2) for each subsample and compare the coefficients on the agency variable interaction terms DecDummy* Sales Change * AgencyVar (β_3 through β_6) in (2) between the Strong and Weak Governance subsamples.[12] To support Hypothesis 2, coefficients β_3 through β_6 should be more pronounced in the Weak Governance subsample than in the Strong Governance subsample.

Columns 2 to 5 in panel B of Table 6 present the results for our subsample tests based on the first corporate governance factor: *Takeover Threat*. For all four agency variables, we find significant effects in the predicted direction in the Weak Governance subsample, but insignificant effects in the Strong Governance subsample, indicating that takeover threats are effective in curtailing the agency problem in SG&A cost decisions. Specifically, in the Weak Governance subsample, we find a significantly negative coefficient on *FCF* (−1.539, $t = -3.80$), a significantly negative coefficient on *Tenure* (−0.009, $t = -2.78$), a significantly positive coefficient on *Horizon* (0.162, $t = 1.98$), and a significantly positive coefficient on *FixedPay* (0.301, $t = 2.05$). By contrast, in the Strong Governance subsample, we find that the coefficient is significant for none of the four agency variable interaction terms. These results suggest that a combination of weak governance (i.e., when managers are protected by more anti-takeover provisions) and the agency problem leads

10. For the remaining tests (results summarized in Tables 6 through 8), we find qualitatively similar results using raw FCF variable or FCF instrumental variable. We report regression results using raw FCF variable in our paper, but the results using FCF instrumental variable are available upon request.
11. See Banker et al. 2011 for a discussion of these two instrumental variable approaches.
12. We made this research design choice because the alternative research design would involve four-way interaction terms (Decrease dummy * Sales change * AgencyVar * Governance), which would make the coefficients difficult to interpret.

TABLE 6
SG&A cost asymmetry for strong governance vs. weak governance subsamples

Panel A: Factor analysis of corporate governance measures

Variables	Estimated Factor Loadings	
	Factor 1	Factor 2
Board Size	0.41	−0.22
CEO/Chairman Separation	−0.13	−0.31
% Independent Directors	0.07	0.71
% Institutional Ownership	−0.17	0.77
BCF Anti-takeover Index	0.86	0.22
Staggered Board	0.87	0.16
Eigenvalues	1.79	1.23
Cumulative proportion of total sample variance	0.299	0.504
Label of extracted factors	*Takeover Threat*	*Other Governance Variables*

Panel B: Subsample analysis

	Factor 1: Takeover threat				Factor 2: Other Governance variables			
	Weak Governance (Factor Score > = median)		Strong Governance (Factor score < median)		Weak Governance (Factor Score > = median)		Strong Governance (Factor score < median)	
	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat
Intercept	0.018	2.93***	0.014	1.87**	0.022	3.26***	0.013	1.82**
Sales Change	0.823	28.34***	0.729	28.16***	0.764	26.68***	0.775	29.24***
*DecDummy*Sales Change*	−0.042	−0.56	−0.056	−0.77	−0.037	−0.46	−0.064	−0.88

(The table is continued on the next page.)

TABLE 6 (Continued)

	Factor 1: Takeover threat				Factor 2: Other Governance variables			
	Weak Governance (Factor Score > = median)		Strong Governance (Factor score < median)		Weak Governance (Factor Score > = median)		Strong Governance (Factor score < median)	
	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat
Interaction Terms: (Variable*DecDummy*Sales Change)								
Free Cash Flow	−1.539	−3.80***	−0.167	−0.63	−0.961	−3.25***	−0.687	−1.76**
Tenure	−0.009	−2.78***	−0.0002	−0.06	−0.005	−1.33*	−0.005	−1.62*
Horizon	0.162	1.98**	0.062	0.89	0.133	1.75**	0.060	0.69
FixedPay	0.301	2.05**	0.094	1.19	0.230	2.31**	0.090	0.79
Employee Intensity	−0.021	−0.40	0.084	3.56***	0.020	0.59	0.061	1.52*
Asset Intensity	−0.079	−1.15	−0.171	−5.37***	−0.036	−0.72	−0.172	−4.43***
Successive Decrease	−0.046	−0.61	0.062	0.99	−0.024	−0.38	0.063	0.77
Stock Performance	−0.006	−0.14	0.037	0.67	0.086	1.60*	−0.019	−0.36
Standalone Variables:								
Free Cash Flow	0.042	1.38*	0.173	6.12***	0.107	3.86***	0.132	4.39***
Tenure	0.0001	0.57	0.0004	1.41*	0.0002	0.71	0.0003	1.03
Horizon	0.002	0.49	0.003	0.61	0.004	0.78	0.002	0.29
FixedPay	0.004	0.55	0.0006	0.08	0.007	0.93	−0.006	−0.63
Employee Intensity	0.012	3.39***	0.006	1.50*	0.011	3.27***	0.006	1.79**
Asset Intensity	0.002	0.45	−0.001	−0.29	−0.003	−0.64	0.006	1.21
Successive Decrease	−0.023	−4.37***	−0.020	−3.22***	−0.025	−4.25***	−0.020	−3.51***
Stock Performance	−0.013	−3.16***	−0.004	−1.03	−0.003	−0.74	−0.010	−2.42***

(The table is continued on the next page.)

TABLE 6 (Continued)

	Factor 1: Takeover threat				Factor 2: Other Governance variables			
	Weak Governance (Factor Score > = median)		Strong Governance (Factor score < median)		Weak Governance (Factor Score > = median)		Strong Governance (Factor score < median)	
	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat
Year Dummies	Suppressed				Suppressed			
N	2,641		2,637		2,637		2,641	
Adjusted R^2	68.40%		65.88%		66.91%		66.65%	

Note:

This table presents the results of estimating SG&A cost asymmetry for strong governance vs. weak governance subsample. Panel A of this table presents the principal component analysis with Varimax rotation on the six governance variables. See Table 2 for the definitions of the governance variables. Panel B of this table presents the regression results from the following regression model. The sample is partitioned into weak and strong governance subsamples based on the strength of corporate governance (above and below median factor score using each factor). See Table 2 for variable definitions. The coefficient estimates are based on firm clustered standard errors (Petersen 2009). *, **, and *** denote significance at levels of 0.1, 0.05, and 0.01 using two-tailed tests, respectively.

$$\log\left(\frac{SG\ \&\ A_{i,t}}{SG\ \&\ A_{i,t-1}}\right) = \beta_0 + \beta_1 \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \beta_2 DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \sum_{m=3}^{6} \beta_m DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) \cdot AgencyVar_{m,i,t} + \sum_{p=7}^{10} \beta_p DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) \cdot EconVar_{p,i,t} + \sum_{q=11}^{14} \beta_q AgencyVar_{q,i,t} + \sum_{s=15}^{18} \beta_s EconVar_{s,i,t} + \varepsilon_{i,t} \quad (2)$$

managers to delay the cutting of SG&A costs when revenue decreases. However, under strong governance (when managers are protected by fewer anti-takeover provisions), the agency problem is not the primary driver of SG&A cost stickiness.

Columns 6 to 9 of Table 6, panel B present the results for the subsample tests based on the second corporate governance factor: *Other Governance Variables* (mainly driven by percentage of independent directors and percentage of institutional shareholders). Again, for all four agency variables, we find significant effects in the predicted direction in the Weak Governance subsample. Specifically, in the Weak Governance subsample, we find a significantly negative coefficient on *FCF* (−0.961, $t = -3.25$), a significantly negative coefficient on *Tenure* (−0.005, $t = -1.33$), a significantly positive coefficient on *Horizon* (0.133, $t = 1.75$), and a significantly positive coefficient on *FixedPay* (0.230, $t = 2.31$). By contrast, in the Strong Governance subsample, we only find significant coefficients on two out of the four agency variables, that is, a significantly negative coefficient on *FCF* (−0.687, $t = -1.76$), and a significantly negative coefficient on *Tenure* (−0.005, $t = -1.62$). We find insignificant effects on SG&A cost stickiness for *Horizon* and *FixedPay*. We interpret these results as suggesting that the association between SG&A cost stickiness and the agency problem is also mitigated by the second governance factor.

Taken together, the results in Table 6 provide support for Hypothesis 2, indicating that corporate governance mechanisms such as takeover threats, institutional shareholders, and board independence are effective in reducing the impact of the agency problem on SG&A cost asymmetry.[13]

Additional analyses

We conduct additional analyses to provide further support for the agency argument. First, we conduct an analysis to provide more direct evidence on whether the agency problem shifts SG&A cost asymmetry from its optimal level. Building on Banker et al.'s 2011 results of the cross-sectional variations in the long-term value created by SG&A expenditures, we predict that the extent to which the agency problem affects managers' SG&A cost decisions depends on the varying future value creation potential of SG&A costs across firms. As Banker et al. (2011: 8) argue, "[m]yopic behavior is unlikely to dominate where incremental long-term investments can generate sufficiently high future value to outweigh the short-term benefits from myopic behavior." Thus, we predict that when SG&A costs create greater future value, SG&A cost stickiness should be influenced more by economic considerations than by agency considerations. We test this prediction by partitioning our sample based on the industry-specific impact of lagged SG&A on return on assets documented in Table 2 of Banker et al. 2011 and comparing the coefficients on the agency variable interaction terms across the two subsamples. The results are shown in Table 7. We find that β_2 is significantly negative in the High Value Creation subsample but is insignificant in the Low Value Creation subsample. This is consistent with managers trading off the potential costs from reduced profit against the potential benefits from higher compensation associated with size when they consider delaying the cutting of SG&A costs. When SG&A costs create high future value, cutting too much SG&A costs in the short

13. Recent research suggests that corporate governance can be endogenous (Dey 2008). We address the corporate governance endogeneity issue by regressing the two corporate governance factors on well-documented determinants of corporate governance variables and then using the residuals from the regressions as instrumental variables in our subsample tests of the effect of the agency problem on SG&A cost stickiness. Specifically, we regress our two corporate governance factors on the following determinants: *Firm Size* (measured by the natural logarithm of sales), *Growth* (captured by the standard deviation of sales revenue over the five years prior to the event year divided by the mean of sales revenue over the five years prior to the event year), *Leverage* (measured by the ratio of long-term debt to total assets), *FCF,* and *Future Value Created by SG&A Costs*. Our results are robust.

TABLE 7
SG&A cost asymmetry for subsamples with different SG&A future value creation

	High value creation (Future Value > = median)		Low value creation (Future Value < median)	
	Coefficient	*t*-stat	Coefficient	*t*-stat
Intercept	0.011	1.63*	0.022	3.18***
Sales Change	0.837	35.76***	0.725	23.90***
*DecDummy*Sales Change*	−0.210	−2.61***	0.032	0.46
Interaction Terms: (Variable*DecDummy*Sales Change)				
Free Cash Flow	−0.796	−2.58***	−0.771	−2.22**
Tenure	−0.006	−1.54*	−0.004	−1.43*
Horizon	0.017	0.21	0.225	2.63***
FixedPay	0.040	0.36	0.242	2.01**
Employee Intensity	0.056	2.12**	0.006	0.11
Asset Intensity	−0.130	−3.62***	−0.110	−2.12**
Successive Decrease	0.160	1.89**	−0.075	−1.17
Stock Performance	−0.019	−0.41	0.082	1.93**
Standalone Variables:				
Free Cash Flow	0.074	3.29***	0.182	4.63***
Tenure	−0.0001	−0.23	0.001	1.76**
Horizon	0.001	0.28	0.004	0.70
FixedPay	0.002	0.36	0.006	0.68
Employee Intensity	0.007	2.65***	0.014	3.08***
Asset Intensity	−0.003	−0.92	0.008	1.34*
Successive Decrease	−0.025	−4.11***	−0.017	−2.81***
Stock Performance	−0.012	−3.52***	0.002	0.39
Year Dummies	Suppressed			
N	2,594		2,528	
Adjusted R^2	70.72%		63.90%	

Note:

This table presents the regression results from the following regression model. The sample is partitioned into two subsamples based on the future value creation of SG&A costs *(FutureValue)* documented in Banker et al. 2011. See Table 2 for variable definitions. The coefficient estimates are based on firm clustered standard errors (Petersen 2009). *, **, and *** denote significance at levels of 0.1, 0.05, and 0.01 using two-tailed tests, respectively.

$$\log\left(\frac{SG\ \&\ A_{i,t}}{SG\ \&\ A_{i,t-1}}\right) = \beta_0 + \beta_1 \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \beta_2 DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \sum_{m=3}^{6} \beta_m DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) \cdot AgencyVar_{m,i,t} + \sum_{p=7}^{10} \beta_p DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) \cdot EconVar_{p,i,t} + \sum_{q=11}^{14} \beta_q AgencyVar_{q,i,t} + \sum_{s=15}^{18} \beta_s EconVar_{s,i,t} + \varepsilon_{i,t} \quad (2)$$

term would potentially lead to lower performance in the long term. On the other hand, when SG&A costs create low future value, delaying the cutting of SG&A costs in the short term would lead to wasteful expenditures on SG&A costs and potentially lower

performance in the long term. Therefore, when SG&A costs create higher future value, managers should be more likely to delay the cutting of SG&A costs, leading to greater cost stickiness; conversely, when SG&A costs create lower future value, managers are more likely to cut SG&A costs, leading to lower cost stickiness.

More importantly, in addition to the main effect of SG&A value creation potential on cost stickiness, we find that, as predicted, the agency problem influences cost stickiness to a greater extent in firms where SG&A costs create lower long-term value compared to firms where SG&A costs create higher long-term value. Specifically, for all four agency variables, we find significant effects in the predicted direction in the Low Value Creation subsample: a significantly negative coefficient on *FCF* (−0.771, $t = -2.22$), a significantly negative coefficient on *Tenure* (−0.004, $t = -1.43$), a significantly positive coefficient on *Horizon* (0.225, $t = 2.63$), and a significantly positive coefficient on *FixedPay* (0.242, $t = 2.01$). By contrast, in the High Value Creation subsample, we only find significant coefficients on two out of the four agency variables, i.e., a significantly negative coefficient on *FCF* (−0.796, $t = -2.58$), and a significantly negative coefficient on *Tenure* (−0.006, $t = -1.54$). We find insignificant effects on SG&A cost stickiness for *Horizon* and *FixedPay*. These results suggest that, even though the low value creation potential of SG&A costs induces an overall lower degree of cost stickiness, managers with severe agency problems still delay the cutting of SG&A costs, resulting in greater cost stickiness than dictated by economic considerations. Under the assumption that future firm value will decline in those firms where managers retain SG&A costs due to the agency problem even though SG&A costs do not create high future value, we interpret these results as providing indirect evidence that shareholders incur costs in those firms where the agency problem shifts cost asymmetry from its optimal level. Consistent with this, we find that *ROE* in year $t + 1$ is significantly lower ($t = 1.99$) for the Low Value Creation subsample ($ROE = 0.110$) than for the High Value Creation subsample ($ROE = 0.120$) even though ROEs in year $t-1$ and year t are not significantly different between the two subsamples. This result provides more direct evidence that shareholders incur costs in those firms where the agency problem shifts cost asymmetry from its optimal level.

Second, if the empirical results documented in our main tests are driven by the agency problem, the effects should be more pronounced in mature firms than in growth firms because SG&A costs capture more slack resources in mature firms than in growth firms. To test this conjecture, we partition our sample based on the life-cycle stage of each firm year, measured as the standard deviation of sales revenue over the five years prior to the event year divided by the mean of sales revenue over the five years prior to the event year (Banker et al. 2011) and compare the coefficients on the agency variable interaction terms across the two subsamples.[14] Table 8, Panel A summarizes the results. We find that β_2 is significantly negative in growth firms only, suggesting that cost stickiness is much more pronounced in growth firms than in mature firms. Consistent with our prediction, we find that the agency problem influences cost stickiness to a greater extent in mature firms than in growth firms. For all four agency variables, we find significant effects in the predicted direction in the Mature Firms subsample: a significantly negative coefficient on *FCF* (−1.067, $t = -2.77$), a significantly negative coefficient on *Tenure* (−0.009, $t = -2.61$), a significantly positive coefficient on *Horizon* (0.209, $t = 2.60$), and a significantly positive coefficient on *FixedPay* (0.341, $t = 2.67$). However, in the Growth Firms subsample, we only find significant coefficients on two out of the four agency variables, that is, a

14. We get similar results when we use Tobin's *Q* (calculated as total assets (data item 6) plus market value (data item 199 * data item 25) minus common equity (data item 60) – deferred taxes (data item 74) divided by total assets (data item 6)) (Chen, Chen, and Wei 2011) to partition our sample into growth versus mature firms.

TABLE 8
SG&A cost asymmetry for growth firms vs. mature firms

Panel A: Regression analysis

	Growth firms (StdDevSale > = median)		Mature firms (StdDevSale < median)	
	Coefficient	*t*-stat	Coefficient	*t*-stat
Intercept	0.011	1.21	0.022	3.68***
Sales Change	0.808	32.63***	0.719	23.34***
*DecDummy*Sales Change*	−0.154	−2.08**	0.117	1.58
Interaction Terms: (Variable*DecDummy*Sales Change)				
Free Cash Flow	−0.741	−2.74***	−1.067	−2.77***
Tenure	−0.005	−1.57*	−0.009	−2.61***
Horizon	0.017	0.23	0.209	2.60***
FixedPay	0.041	0.49	0.341	2.67***
Employee Intensity	0.078	3.15***	−0.002	−0.04
Asset Intensity	−0.202	−4.97***	−0.020	−0.35
Successive Decrease	0.045	0.68	−0.019	−0.26
Stock Performance	0.012	0.33	0.117	2.29***
Standalone Variables:				
Free Cash Flow	0.092	3.64***	0.129	4.08***
Tenure	0.0002	0.78	0.0001	0.05
Horizon	0.004	0.82	0.001	0.26
FixedPay	0.002	0.22	0.010	1.28
Employee Intensity	0.010	3.19***	0.008	2.06**
Asset Intensity	0.001	0.15	0.010	2.08**
Successive Decrease	−0.027	−3.68***	−0.016	−3.14***
Stock Performance	−0.005	−1.60*	−0.010	−2.22**
Year Dummies	Suppressed			
N	2,555		2,555	
Adjusted R^2	69.63%		64.63%	

Panel B: Characteristics of subsamples

		Growth firms (StdDevSale > = median)				Mature firms (StdDevSale < median)			
		N	Mean	Median	StdDev	*N*	Mean	Median	StdDev
High value creation (FutureValue > = median)	*FutureValue*	1,483	1.019	0.645	0.545	1,093	0.821	0.645	0.456
	StdDevSales		0.488	0.374	0.358		0.111	0.111	0.047
Low value creation (FutureValue < median)	*FutureValue*	1,070	0.283	0.285	0.110	1,458	0.258	0.285	0.124
	StdDevSale		0.399	0.315	0.244		0.108	0.107	0.047

(The table is continued on the next page.)

TABLE 8 (Continued)

Note:

This table presents the regression results from the following regression model. The sample is partitioned into mature firms and growth firms based on the life-cycle stage of each firm year, measured as the standard deviation of sales revenue over the five years prior to the event year divided by the mean of sales revenue over the five years prior to the event year (Banker et al. 2011). Panel A shows the regression results and panel B provides sample characteristics. See Table 2 for variable definitions. The coefficient estimates are based on firm clustered standard errors (Petersen 2009). *, **, and *** denote significance at levels of 0.1, 0.05, and 0.01, respectively, using two-tailed tests.

$$\log\left(\frac{SG\ \&\ A_{i,t}}{SG\ \&\ A_{i,t-1}}\right) = \beta_0 + \beta_1 \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \beta_2 DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \sum_{m=3}^{6} \beta_m DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) \cdot AgencyVar_{m,i,t} + \sum_{p=7}^{10} \beta_p DecDummy \cdot \log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) \cdot EconVar_{p,i,t} + \sum_{q=11}^{14} \beta_q AgencyVar_{q,i,t} + \sum_{s=15}^{18} \beta_s EconVar_{s,i,t} + \varepsilon_{i,t} \quad (2)$$

significantly negative coefficient on *FCF* (−0.741, $t = -2.74$), and a significantly negative coefficient on *Tenure* (−0.005, $t = -1.57$). We find insignificant effects on SG&A cost stickiness for *Horizon* and *FixedPay*. These results support our prediction that SG&A cost stickiness is driven by the agency problem to a larger extent in mature firms than in growth firms. Even though SG&A cost stickiness is substantially reduced in mature firms, managers with severe agency problems still delay the cutting of SG&A costs, resulting in greater cost stickiness than mandated by economic factors.

If there is a positive correlation between the long-term value created by SG&A costs and the growth prospects of a company, it is possible that the results from the above two additional analyses are driven by the same set of firms. To better understand this issue, we examine the distribution of firm-year observations for these two dimensions. As shown in panel B of Table 8, growth firms and mature firms are approximately evenly distributed across the High Value Creation and Low Value Creation subsamples, indicating that these two dimensions are orthogonal to each other and therefore our two additional analyses do not reflect the same phenomenon.

By showing that the cross-sectional variation in the effect of agency factors on SG&A cost stickiness is consistent with theoretical predictions, the above additional tests help alleviate the concern that our results are driven by omitted variables and provide further support for our hypothesis that the agency problem influences the degree of cost asymmetry.

Robustness checks

We assess the sensitivity of our results in the following ways.

First, we use two alternative denominators for our measure of FCF (book value of equity and the sum of book value of equity and book value of long-term debt). We also calculate an alternative measure of FCF to account for investment activities: operating cash flow (data item 308) plus cash receipts from sales of property, plant, and equipment (data item 107) minus capital expenditure and acquisition expenditure (data items 128 and 129) scaled by total assets (Richardson 2006). Our results are robust to these alternative measures of FCF.

Second, the previous literature documents that R&D and advertising expenses represent value-enhancing investments and thus have positive impact upon future operating income (e.g., Lev and Sougiannis 1996). As a result, R&D and advertising expenses may behave differently than the other components of SG&A costs. We repeated our analyses after excluding R&D and advertising from total SG&A costs.[15] This alternative measure of SG&A costs did not change our results.

Third, we examine an alternative measure of CEO compensation, pay-for-performance sensitivity. We do not make a directional prediction on the effect of pay-for-performance sensitivity on SG&A cost stickiness because, on the one hand, pay-for-performance sensitivity may help align the interests of managers with the interests of shareholders and thus reduce the agency problem in general; but, on the other hand, a higher proportion of at-risk pay encourages managers' empire building behavior (Kanniainen 2000). We follow Core and Guay's 2002 methodology in measuring pay-for-performance sensitivity, which is calculated as the sensitivity of the value of the CEO's equity portfolio as of the end of year $t-1$ to a 1 percent change in stock price minus the sensitivity of the value of the CEO's equity portfolio as of the end of year $t-2$ to a 1 percent change in stock price deflated by average total assets. We do not find a significant effect of pay-for-performance on SG&A cost stickiness. Including this alternative measure of CEO compensation does not affect our other results.

In addition, we control for potential industry effects in our regressions by adding 48 industry dummies based on Fama-French industry classification (Fama and French 1997). Our results are unaffected by the inclusion of these dummies. Furthermore, firms with merger and acquisition (M&A) activities in year t may inherit sales and SG&A costs from the firms that they acquire or merge with, creating noise for our analysis. Excluding firm-years with M&A activities did not change our results.

Finally, in the sample selection, we followed Anderson and Lanen's 2007 suggestion and excluded observations where SG&A costs move in the opposite direction of sales in both the base sample and the testing sample. As a robustness check, we estimated our models without excluding these observations. Our results do not change, although the magnitude of cost stickiness is greater in the sample that included these observations than in the sample that excluded these observations.[16] This is consistent with Banker et al. 2010, whose simulation tests show that excluding these observations biases the coefficient β_2 downward.

5. Conclusion

In this study we examine whether agency factors drive SG&A cost behavior in addition to economic factors. Based on the empire building and the downsizing literatures, we predict a significant association between the agency problem and cost asymmetry. In addition, we expect corporate governance to reduce the agency problem and therefore predict that corporate governance mitigates the positive association between the agency problem and cost asymmetry. Our findings are consistent with these predictions. We find strong evidence that cost asymmetry is positively associated with managers' empire building incentives due to the agency problem, as measured by FCF, CEO horizon, tenure, and compensation structure. Moreover, we find that the positive association between the agency problem and SG&A cost asymmetry is more pronounced under weak corporate governance, suggesting that corporate governance mechanisms play an important role in mitigating the effect of the agency problem on managers' cost adjustment decisions in response to exogenous shocks to

15. We assume that R&D and/or advertising costs are zero for those firms that do not disclose R&D and/or advertising costs separately.
16. Results are available upon request.

demand. Finally, we provide preliminary but more direct evidence that the agency problem shifts SG&A costs stickiness from its optimal level dictated by economic factors.

Our study extends the prior literature on SG&A cost stickiness by providing the first large-sample empirical evidence for an additional explanation for the SG&A cost asymmetry phenomenon from the agency perspective. By documenting the effects of agency factors on cost asymmetry, our study sheds light on the role that managers play in adjusting costs in response to exogenous shocks to output demand. In addition, our study contributes to the FCF literature as well as to a growing literature that examines the impact of the agency problem on managers' specific business decisions and the effectiveness of corporate governance in mitigating the agency problem.

Results of our study should be interpreted with the following caveats in mind. First, although we have controlled for known economic determinants in the prior literature, it is possible that we have not controlled for all possible economic determinants and our agency factors may not be perfect proxies for the agency problem. However, in the absence of theory, there is little guidance as to additional economic determinants we should include in the SG&A cost stickiness model. Second, even though cost stickiness is a robust phenomenon in our sample, the degree of cost stickiness is substantially reduced once we follow Anderson and Lanen's 2007 suggestion and remove observations where sales and SG&A costs move in opposite directions. With these caveats in mind, we believe that findings of our study support agency conflicts as an important explanation for SG&A cost behavior and also support the importance of corporate governance in mitigating the influence of the agency problem on managers' cost adjustment decisions.

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