The Effect of Strategy on Asymmetric Cost Behavior of SG&A Expenses

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Abstract

The current study examines the effect of strategy and managerial ability on asymmetric cost behavior of SG&A expenses. We use a sample of US listed firms for the period 1991-2014 to provide empirical evidence that sticky cost phenomenon is associated with firms' strategic orientation. Our findings suggest that a firm's strategic orientation determines the direction of cost asymmetry in the case of SG&A expenses. Firms classified as prospectors exhibit SG&A cost stickiness whereas firms classified as defenders exhibit SG&A cost anti-stickiness. Sensitivity tests indicate that a firm's decisions on its strategic positioning and its portfolio of strategic intangible resources affect resource allocation decisions that are associated with the direction of asymmetric cost behavior. In addition, is seems that strategy remains a significant contributing factor concerning the intensity of cost asymmetry in the case of SG&A expenses under the presence of different levels of market concentration. Thus, the presence of asymmetric cost behavior seems to be an outcome of managerial decisions rather than a primary cause of a firm's strategic positioning.

Key words: Asymmetric Cost Behavior, Strategy

JEL Classification: L10, M10, M41

Data availability: Data are publically available

Introduction

This study explores the relation between a firm's strategic orientation and the direction of asymmetric cost behavior in the case of SG&A expenses. Empirical evidence concerning the

relation between strategy and cost asymmetry might provide valuable knowledge about different research dimensions of strategic management accounting such as monitoring competition (Bjøornenak and Olson, 1999), shaping strategically oriented information for decision making, management control (Bromwich, 1990; Shank, 1996) and strategic positioning (Roslender and Hart, 2003; Roslender, 1995).

Prior literature mainly focuses on SG&A expenses to explain the cross sectional variation in the degree of cost stickiness and has identified a number of factors that contribute to its intensity such as the magnitude of adjustment costs (i.e. the magnitude of economic sacrifices, social, contracting or psychological costs), the managerial expectations for the anticipated level of sales, the magnitude of economic activity change, incentives for managing earnings, intensity of intangible investments (Anderson, Banker, & Janakiraman, 2003; Banker, Flasher, & Zhang, 2013; Calleja, Steliaros, & Thomas, 2006; Venieris, Naoum, & Vlismas, 2015). In an attempt to formulate an integrated theoretical framework for asymmetric cost behavior, Banker and Byzalov (2014) argue that managerial decisions for resource commitments associated with sticky cost phenomenon depend not only on concurrent sales but also on: (i) prior resource levels, which affect the level of adjustment costs, (ii) expected future sales, which affect the level of future adjustment costs and (iii) agency and behavioral factors which drive manager's actual choices.

The association of asymmetric cost behavior with managerial decisions for resource commitments triggers a research interest to examine the relation of the sticky cost phenomenon with wider strategic decisions (Balakrishman, & Gruca, 2008). A plausible assumption is that a firm's strategic orientation might cause variability on the intensity of SG&A cost stickiness. Cost stickiness has been attributed to deliberate resource commitment decisions made by managers in order to maintain idle resources after sales volume declines (Banker, & Bylazov. 2014). Such managerial resource commitment decisions are expected to

be anchored to business strategy which shapes a firm's priorities for the optimum resource usage. Banker et al. (2013) provide empirical evidence that firms pursuing a differentiation strategy exhibit greater cost stickiness, on average, as compared to firms pursuing a cost leadership strategy. We conjecture that a firm's strategic orientation determines not only the intensity but also the direction of cost asymmetry in the case of SG&A expenses.

We hypothesize that firms classified as prospectors according to Miles and Snow's (2003) strategic typology exhibit SG&A cost asymmetry. We assume that firms classified as prospectors are more innovative and they are engaged on resource demanding organizational activities with the intention to develop specific types of strategic resources (e.g. R&D programs, advertising campaigns, human resource development programs, sophisticated customer relationship management systems, etc.). The aforementioned organizational activities (i) consume resources which are associated with SG&A expenses, (ii) their strategic significance elevates the levels of the associated future and current period's adjustment costs and (iii) they are anchored with increased uncertainty for the anticipated level of future sales. According to Banker and Bylazov (2014), increased future and/or current period's adjustment costs and optimistic managerial expectations for the future sales increase the intensity of cost stickiness. On the contrary, firms classified as defenders according to Miles and Snow's (2003) strategic typology, are expected to exhibit decreased SG&A cost stickiness because their strategic orientation (i.e. focus on achieving incremental growth primarily through market penetration, efficient cost management and effective usage of single core technology, etc.) is expected to reduce the levels of future and current period's adjustment costs attributed to SG&A expenses.

Our data sample consists of 27,708 firm-year observations of US listed firms for the period 1991-2014. The strategic profile of each firm is defined using the methodological approach developed by Bentley, Omer, & Sharp, (2013). Our empirical evidence indicates that in the

case of firms classified as prospectors (defenders) SG&A expenses exhibit cost stickiness (anti-stickiness). Further, additional sensitivity tests indicate that the methodological approach proposed by Bentley et al. (2013) to separate firms according to their strategic profile has increased discriminative power. Finally, we performed various granger causality tests to eliminate alternative explanations of the reported evidence of this study and to postulate that a firm's strategic position is responsible for the presence of asymmetric cost behavior in the case of SG&A expenses.

In light of previous empirical findings that associate SG&A cost stickiness with intangible investments (Venieris et al. 2015) and the importance of intangible resources as strategic enablers (Martín-de-Castro, Delgado-Verde, López-Sáez, & Navas-López, 2011), we examined the dependencies between a firm's strategic orientation, its intensity of cost asymmetry and its level of intangible investments. It seems that a firm's strategic orientation and its level of intangible investments are determinants of SG&A cost stickiness. Further, it seems that past levels of a firm's intangible investments do not determine its strategic orientation in the present.

Background

Strategic typologies

Strategy is an organizational process that attempts to determine the basic long-term goals of a firm and define the course of action and economic resources required to achieve these goals (Nag, Hambrick, & Chen, 2007). Strategic management literature has developed various strategic typologies that is theoretical constructions aiming to map the generic courses of organizational actions that firms should follow, based on the available resources and an evaluation of the business environment in which a firm competes. Strategic typologies recognize a number of discrete generic strategic prototypes and thus, define a strategic continuum of mixed strategies a firm might follow. For instance, Porter (1980) recognizes

cost leadership and product differentiation as the two generic strategic prototypes. Miles and Snow's (1978; 2003) theory classifies firms into four types of business strategy: (i) prospecting (i.e. innovative and exploratory firms), (ii) defending (i.e. firms focusing on efficiency), (iii) reacting (i.e. firms waiting for environmental signals), and (iv) analyzing (i.e. a mix of prospecting and defending). March (1991) describes business strategies in terms of exploration or exploitation; and Treacy and Wieresma (1995) as operational excellence, product leadership and customer intimacy.

The current study is anchored to Miles and Snow's strategic typology (1978; 2003). Within the context of accounting and finance research designs, Miles and Show's typology (1978; 2003) seems to have certain advantages. Bentley et al. (2013) argue that Miles and Show's theory can be likely aligned with other strategic typologies enabling researchers to achieve wider theoretical validity for their research findings. Further, this strategic typology has been empowered with a specialized financial statement analysis (Bentley et al., 2013) for diagnosing a firm's strategic orientation from various financial indicators which facilitates the implementation of quantitative research designs with a large scale of archival data. Prospectors and defenders represent the two principal business strategies.

A firm classified as a prospector is oriented toward economic growth, highly innovative and risk taking through the exploitation of new products and market opportunities. For this reason, prospectors invest a considerable amount of resources on R&D and marketing activities in an attempt to achieve rapid response to environmental challenges and create multiple technologies for a diverse product mix avoiding long-term commitments to a single technological process. As a result, prospectors rarely achieve maximum efficiency in their production and distribution. In order to support the aforementioned strategic choice, the organizational structure of a prospector organization is decentralized with a low degree of formalization and complex coordination mechanisms.

On the other hand, a firm classified as defender focuses on narrow and stable product portfolio. In this case, the strategic orientation is on achieving incremental growth primarily through market penetration, efficient cost management and effective usage of single core technology. The organizational structure of defenders is characterized by high degree of formalization and centralized control. A firm classified as defender focuses on efficiency in the production and distribution of goods and services.

Following Bentley et al. (2013), our research will focus on firms classified as either prospectors or defenders. Analyzers adopt a strategic position that combines elements from prospectors and defenders. Reactors represent the only not viable strategic position. In fact, a firm classified as a reactor has no coherent strategic orientation and it attempts to react to environmental events without any serious intention or significant ability to influence those events. Besides the practical difficulties to define and identify a specific pattern concerning reactors' financial profile; another methodological issue arises from the nature of sticky cost phenomenon which is aligned with deliberate resource-commitment decisions. It is rather difficult to establish a rationale that aligns deliberate managerial resource-commitment decisions with a firm having no specific strategic orientation and intent. For these reasons, we exclude reactors from our analysis. Focusing on the two extremes of Miles and Snow's strategic continuum enables us to examine if changes on firm's strategic orientation affect cost asymmetry. To the extent that cross-sectional variations in the qualitative characteristics of firms clustered with similar strategic orientation can be quantified, further conclusions can be drawn for the relation of cost asymmetry with a firm's strategy.

Asymmetric Cost Behavior

The traditional analysis of cost behavior assumes a symmetric relationship between sales and costs. It introduces a dichotomous distinction of costs as fixed versus variable with respect to changes in the quantity of goods or services produced or sold within the relevant range of

activity (Anderson et al., 2003; Noreen, 1991). Adherents of asymmetric cost behavior distinguish cost items as those that move mechanistically with changes in volume versus costs that are determined by the resources committed by managers. Deliberate managerial commitment decisions associated with specific resources trigger the sticky cost phenomenon (Anderson et al., 2003; Banker, & Byzalov, 2014).

Costs are classified as sticky (or anti-sticky) if their increase in absolute terms associated with an increase in a firm's economic activity is greater (smaller) than their decrease in absolute terms associated with an equivalent decrease in a firm's economic activity. Weiss (2010), using a new firm-level measure of cost asymmetry, provided the first broad-based evidence of the asymmetric cost behavior. Asymmetric cost behavior has been observed across different categories of operating costs (Anderson et al., 2003; Chen, Lu, & Sougiannis, 2012; Balakrishnan, & Gruca, 2008; Kama, & Weiss, 2013) and across different countries (Banker, & Byzalov, 2014).

Cost stickiness has been attributed to rational decisions made by managers to bear the costs of temporary unused capacity. Banker and Byzalov (2014) proposed an integrated theoretical framework for interpreting sticky cost phenomenon based on the interaction between managerial decisions and adjustment costs. For simplicity reasons, Banker and Byzalov (2014) assumed that adjustment costs are recorded separately from resource costs. Available resource capacity depends on the level of resources that were carried from the prior fiscal year. When demand increases, sales can exceed available resources and managers will decide to add more resources in order to make firm capable of responding increased demand. On the contrary, if current sales fall below available capacity, managers will reduce the slack capacity to an acceptable level. However, a decision to reduce idle resources is anchored with adjustment costs and thus managers will weigh the costs of maintaining unutilized resources against the adjustment costs to dispose these resources. At intermediate sales levels, available

resource capacity is sufficient to accommodate current sales and unutilized capacity is positive but acceptably low (i.e. taking into consideration the level of adjustment costs). Banker and Byzalov (2014) argue that managerial decisions for resource commitments depend not only on concurrent sales but also on: (i) prior resource levels, which affect the level of adjustment costs, (ii) expected future sales, which affect the level of future adjustment costs and (iii) agency and behavioral factors which drive manager's actual choices.

Banker and Byzalov (2014) proposed the integrated theoretical framework for interpreting sticky cost phenomenon in order to unify prior empirical evidence and to facilitate the design of future research initiatives. Prior empirical evidence has documented that when adjustment costs are higher, managers are less inclined to cut costs in the event of a revenue-decline in order to avoid adjustment costs (Anderson et al. 2003; Calleja et al., 2006; Banker et al., 2013). It, also, seems that another key building block of the sticky cost theory is the managerial expectations for the anticipated level of sales. Pessimistic (optimistic) expectations about the permanence of decline in sales should reduce (increase) the cost asymmetry (Banker, & Byzalov, 2014; Banker, Byzalov, Ciftci, & Mashruwala, 2014; Balakrishnan, Peterson, & Soderstrom, 2004; Subramaniam, & Weidermier 2003). Finally, the magnitude of economic activity change has been viewed as a possible cause of cost stickiness. Relatively large changes in sales revenues interrupt the linear pattern of cost behavior (Balakrishnan et al., 2004). Managerial decisions to maintain unutilized resources, which lead to cost stickiness, can also be caused by personal considerations and incentives for managing earnings (Chen et al. 2012; Dierynck, Kama, & Weiss 2013; Landsman, & Renders, 2012). Finally, intangible intensive firms tend to exhibit higher degree of cost asymmetry (Venieris et al., 2015).

Motivation and Research Hypothesis

In an attempt to synthesize different views of strategic management accounting, Tayles (2011) introduced the term "strategy-constituted management accounting" so as to coin the body of management accounting knowledge concerned with the formulation of strategically orientated information for decision making and control. Within the context of strategy-constituted management accounting, the managerial role of cost information has been analyzed through various prisms such as (i) contemporary costing techniques, (ii) strategic costing and (iii) competitor cost accounting. Contemporary costing techniques (e.g. activity based costing and management, attribute costing, quality costing, life cycle costing and target costing, etc.) attempt to reshape traditional costing and to reveal the economic significance of different dimensions of a firm's cost structure and management (Bhimani, Horngren, Datar, & Rajan, 2012; Bromwich, 1990; Heagy, 1991; Shields, & Young, 1991). Strategic costing is a term employed to denote a systematic attempt to associate costing with enterprise strategy and marketing (Shank, & Govindarajan, 1988; Guilding, & Moorhouse, 1992). Competitor accounting locates the pursuit of improved competitive position within the context of an analytic assessment of competitors' cost structure (Bromwich, 1990; Porter, 1985).

An underlining assumption of the strategy-constituted management accounting is that managers adopt a rational behaviour pursuing the optimal allocation of entrepreneurial resources. As a result, regardless of the potential dimensions of cost analysis (i.e. activity based, quality, life-cycle, etc.) or the locus of cost analysis (i.e. internal versus competition); strategy-constituted management accounting information is operationalized within the traditional microeconomic rationalization of operating costs as fixed versus variable with respect to changes in the activity volume (Anderson et al., 2003; Noreen, 1991). Yet, incorporating the possibility of asymmetric cost behavior into strategic costing analysis will expand the decision usefulness of strategy-constituted management accounting information

by incorporating different patterns of resource allocation managerial decision behavior for optimal resources allocation.

Asymmetric cost behavior is attributable to managerial resource commitment decisions and a firm's strategic positioning influences managerial behavior and decisions including those concerning resource commitments. Sticky cost behavior has been attributed to managerial choices in adjusting resources after volume declines. The documented factors that contribute on the intensity of asymmetric cost behavior (Anderson et al., 2003; Banker, & Byzalov, 2014; Chen et al., 2012; Balakrishnan, & Gruca, 2008; Kama, & Weiss, 2013; Venieris et al., 2015), concern different aspects of managerial behavior (i.e. the magnitude of adjustment costs, the level of managerial expectations for future sales, etc.) or wider firm characteristics (i.e. employee or asset intensity, the level of managerial empire building behavior, etc.). A plausible assumption is that the idiosyncratic physiognomy of the aforementioned factors is shaped either as firms' reaction to environmental conditions or as an expression of its predetermined strategic ploy.

Prior research provides some empirical evidence for the relation between strategy and cost asymmetry. Balakrishman and Gruca (2008) documented the presence of cost asymmetry in the case of costs associated with organizational core competency by employing a sample of acute care hospitals. Under the prism of resource based view of business strategy; the documented relation of an internal intangible strategic resource (i.e. organization capital) with SG&A cost stickiness provided by Venieris et al. (2015) can be interpreted as a proximal evidence of the relation between strategic resources and cost asymmetry.

Most notably, Banker et al. (2013) provide empirical evidence that firms which pursue a differentiation strategy exhibit greater cost stickiness, on average, as compared to firms pursuing a cost leadership strategy. This relation is moderated by the optimistic or pessimistic expectations of managers for future sales. We attempt to expand the aforementioned empirical

evidence by documenting that, in the case of SG&A expenses, a firm's strategic positioning affects not only the intensity of asymmetric cost behavior but also its direction. More specifically, we hypothesize that in the case SG&A expenses, firms classified as prospectors should exhibit cost stickiness whereas firms classified as defenders should exhibit cost anti-stickiness. The grounds of our hypotheses conceptualization relies on Banker and Byzalov's (2014) integrated framework for cost asymmetry.

Drawing inferences from Banker and Byzalov's (2014) integrated framework for cost asymmetry, we argue that firms classified as prospectors are expected to (i) exhibit higher prior resource levels associated with past level of SG&A expenses, which increase the current level of adjustment costs and (ii) be associated with various agency and behavioral factors that affect the cost asymmetry of SG&A expenses. Further, despite the fact that Banker and Byzalov's (2014) integrated framework for cost asymmetry refers to managerial optimistic expectations for future sales as a source of cost asymmetry, we conjecture that in the case of firms classified as prospectors the presence of increased uncertainty for the anticipated level of future sales associated with the level of SG&A expenses is responsible for the emerge of asymmetric cost behaviour in the case of SG&A expenses. The presence of the aforementioned factors triggers the sticky cost phenomenon in the case of SG&A expenses.

As noted on the background section, a firm classified as prospector is highly innovative, oriented toward achieving high economic growth rates and risk taking. A plausible assumption is that in order to implement effectively a prospector's strategy, a firm is expected to finance resource demanding organizational activities with the intention of developing and maintaining high levels of specific strategic resources (e.g. innovation programs, advertising campaigns, human resource development programs, sophisticated customer relationship management systems, etc.). This deliberate managerial resource-commitment decision directs a relative high proportion of firm's SG&A expenses to finance core organizational activities

associated with the development and maintenance of the aforementioned strategic resources. Balakrishnan and Grupa (2008) find that core activities have higher adjustment costs. In addition, Venieris et al. (2015) provide empirical evidence that firms with high intensity of organizational capital, namely firms that invest resources on the implementation of core activities for the development and maintenance of intangible strategic resources, exhibit cost stickiness in the case of SG&A expenses. Thus, in the case of a temporary decline in current period's sales revenues, a firm classified as prospector will tend to avoid a reduction of SG&A expenses directed to core organizational activities that they are associated with strategic resources. Within the context of a prospector's strategic conceptualization, this course of action is aligned with high levels of current period adjustment costs because it might reduce the sales generating efficiency of past investments on strategic core competencies accelerating the rate of decline in current period's sales revenues and it might undermine the firm's capability of competing effectively in the future.

Firms classified as prospectors are likely to be associated with various agency and behavioral factors that elevate the cost asymmetry of SG&A expenses. Prior literature has documented an association between free cash flows (a proxy for managerial ability to overspend and an indicator of empire building behavior[1]) as a significant factor contributing on cost asymmetry (Chen et al., 2012). In addition, various managerial characteristics and behavioral biases (i.e. overconfident managers, managerial hubris, etc.) contribute on cost asymmetry (Chen, Gores, & Nasev, 2015; Liang, Zhao, & Wang, 2015; Qin, Mohan, & Kuang, 2015; Yang, 2015). The implementation of a strategy that is oriented toward economic growth, highly innovative and risk taking requires specific types of human assets that are likely to be characterized by an

1. Alternatively, as Banker, Byzalov, Fang, and Liang (2017) note high levels of free cash flows could increase cost stickiness either because it facilitates overspending or it gives managers more latitude to focus on long term value creation.

intense empire building behavior, agency issues and inelastic labor expenditures. For instance, Reid, Liu, and Liu (2016) document that employee-oriented firms exhibit greater cost stickiness attributed to agency issues. Innovation requires, amongst others, high levels of human capital might have substantial adjustment costs even in the long run (Banker et al., 2017, Dierynck et al., 2012; Kong, Liu, & Shen, 2015).

Managers of firms classified as prospectors are more likely to face increased uncertainty concerning the future sales associated with the current level of SG&A expenses. According to Banker, Datar, and Kerke (1988), managers prefer to commit sufficient capacity in advance to avoid excessive congestion costs for high demand organizations due to strained capacity (Banker, Byzalov, Ciftci, & Mashruwala, 2014). When demand uncertainty increases, the expected congestion costs increase leading managers to choose higher capacity to mitigate these costs (Banker et al. 1988). Firms classified as prospectors seek to achieve high sales growth rates by directing SG&A expenses at risk taking sales generating activities for implementing a strategic intention characterized by customer oriented philosophy and high responsiveness to environmental challenges. Investing on risk taking sales generating activities increases the perceived uncertainty for future sales and thus the cost stickiness of the SG&A expenses related with the aforementioned sales generating activities[2].

Based on the aforementioned analysis, we state the following hypothesis:

H1: In the case of firms classified as prospectors, SG&A expenses should exhibit cost stickiness.

2. An alternative assumption can be that in the case of firms classified as prospectors, managers are anchored with optimistic expectations for future efficiency of the sales generating activities, which increase the perceived level of the future adjustment costs of the SG&A expenses related with sales generating activities. Optimistic managerial expectations for future sales direct managers to place more economic significance on the costs of resource adjustments associated with the magnitude of potential reductions on future sales due to a reduction on the SG&A expenses of the current period (Banker et al., 2017).

By contrast, a firm classified as defender focuses on achieving incremental growth primarily through market penetration, efficient cost management, effective usage of single core technology and efficiency in the production and distribution of goods and services. As a result, we expect that firms classified as defenders to exhibit low prior resource levels associated with past level of SG&A expenses, which decrease the current level of adjustment costs. We, also, expect that managers of firms classified as defenders to be anchored with conservative expectations for future sales caused by current level of SG&A expenses which affects the (perceived) level of future adjustment costs. The presence of the aforementioned factors triggers anti stickiness cost behavior in the case of SG&A expenses.

The orientation of a firm classified as defender towards the achievement of high economic efficiency in its operations implies that managers attempt to match current period's sales revenues with a level of SG&A expenses that it is as lower as possible. Thus a plausible assumption is that the managers avoid retaining idle resources associated with SG&A expenses in order to reduce the level of adjustment costs of past SG&A expenses and to be empowered with the administrative flexibility to reduce SG&A expenses in a case of a sale decline. This course of action enables a firm classified as defender to manage better its operating efficiency. In fact, Dierynck et al. (2012) and Kama and Weiss (2013) indicate that asymmetric cost behaviour is lower when managers have incentive to manage earnings to avoid reporting a loss or an earnings decrease.

In addition, a firm classified as defender focuses in achieving incremental growth primarily through market penetration. As a result, it is likely that the managers of a firm classified as defender shape conservative expectations (relatively to the managers of a firm classified as prospector) for the future sales generating capability of the current period's SG&A expenses. This managerial conservatism reduces the perceived level of the future adjustment costs of the SG&A expenses related with sales generating activities in the forthcoming time periods.

The above analysis implies that in the case of firms classified as defenders, it is likely that SG&A expenses should exhibit cost anti stickiness. For this reason, we investigate the empirical validity of the following hypothesis:

H2: In the case of firms classified as defenders, SG&A expenses should exhibit cost anti stickiness.

Data and methods

Classification of Firm Strategy

We adopt the statistic developed by Bentley et al. (2013) as our primary classification variable for grouping firms according to their strategic choice. This variable, called *STRATEGY*, is constructed using financial statement data to classify firms in accordance to Miles and Snow's (1978; 2003) strategic typology. The *STRATEGY* variable ranges from 6 to 30. Bentley et al. (2013) follow stick definitions of *STRATEGY* variable by classifying firms as: defenders (*STRATEGY* variable = 6-12), analyzers (*STRATEGY* variable = 13-23) and prospectors (*STRATEGY* variable = 24-30). We rank and classify the firms of our sample as defenders or prospectors using the median value of STRATEGY variable of each firm.

The analytical process of calculating the *STRATEGY* measure is presented in Appendix A. In fact, the *STRATEGY* measure is the outcome of a sophisticated financial statement analysis which relies on the assumption that a firm's strategic choices are reflected on its financial profile. Adopting a backward looking approach, the *STRATEGY* measure calculates financial ratios for each firm-year weighted by their rolling prior 5-year average value. According to Bentley et al. (2013), the selected financial ratios focus on the level and the behavior of financial items such as of sales revenue, R&D expenses, number of employees in order to assess a firm's intensity to: (i) search for new products, (ii) produce and distribute products and services efficiently, (iii) achieve high growth rates, (iv) exploits new products and services, (v) retain organizational stability and (vi) maintain high capital intensity. A firm

classified as prospector (defender) is expected to exhibit high (low) intensity on the aforementioned strategic dimensions (except in the case of capital intensity).

The use of the *STRATEGY* variable for investigating the relation between strategy and SG&A cost asymmetry poses two methodological issues. The first issue stems from the underlining theoretical underpinning of *STRATEGY* variable. Miles and Snow's (1978, 2003) strategic typology defines a continuum of possible strategic profiles and as a result even within a group of firms classified as defenders or prospectors, variations on the strategic profile can be observed. The second one lies on the inherent skepticism for any sophisticated financial statement tool, such as *STRATEGY* variable, that aims to capture the value of a latent variable.

The aforementioned methodological issues have narrow effects on our research design. The primary research scope of this study is to document if different strategic profiles affect cost asymmetry of SG&A expenses. Thus, the research interest focuses on the two extremes of Miles and Snow's (1978; 2003) strategic typology, which correspond to the two tails of the distribution of the *STRATEGY* variable. This approach emphasizes on the ability of *STRATEGY* variable to discriminate the firms of our data sample into two groups of theoretically opposite strategic profiles rather than on its ability to capture cross-sectional variations on the qualitative characteristics of firms clustered with similar strategic orientation. The discriminative power of *STRATEGY* variable is expected to increase as the size of the data sample increases.

Measuring sticky costs

We applied the standard methodology of Anderson et al. (2003) for detecting the presence of the sticky cost phenomenon. We utilize the two econometric specifications of asymmetric cost behaviour reviewed by Banker and Byzalov (2014) to compare the cost stickiness of SG&A expenses across firms with different strategic orientation: the basic and the extended model.

In the case of SG&A expenses, the econometric specification of Anderson et al.' s basic model (2003) for measuring the degree of cost asymmetry is:

$$log\left(\frac{SG\&A_{i,t}^{j}}{SG\&A_{i,t-1}^{j}}\right) = b_0 + b_1\, log\left(\frac{Rev_{i,t}^{j}}{Rev_{i,t-1}^{j}}\right) + b_2 d_{i,t}^{j} log\left(\frac{Rev_{i,t}^{j}}{Rev_{i,t-1}^{j}}\right) + \varepsilon_{i,t} \qquad \text{Eq. (1)}$$

The main variables used in the model of Eq. (1) are the annual log change in SG&A expenses ($SG\&A_{i,t}^{j}$) and the annual log change in sales revenue ($Rev_{i,t}^{j}$) of firm i classified in j industry in year t. The specification of the model of Eq. (1) incorporates a dummy variable ($d_{i,t}^{j}$) for the direction (increase / decrease) of change in sales of firm i classified in j industry in year t. Dummy variable ($d_{i,t}^{j}$) equals 1 if $Rev_{i,t}^{j} < Rev_{i,t-1}^{j}$ and 0 otherwise. The empirical testing for cost asymmetry implies that $b_1 > 0$ and $b_2 < 0$ ($b_1 > b_1 + b_2$) which indicates that SG&A costs fall less in response to given decline in sales revenue than they increase in response to equivalent increase in revenue. Within the context of hypothesis testing of H_1, the basic model will be estimated for two different data samples of firms having either a prospector's or a defender's strategic profile.

The econometric specification of the extended model is presented by the following Eq. (2):

$$log\left(\frac{SG\&A_{i,t}^{j}}{SG\&A_{i,t-1}^{j}}\right) = b_0 + c_0^{x} X_{i,t}^{j} + (b_1 + c_1^{x} X_{i,t}^{j}) log\left(\frac{Rev_{i,t}^{j}}{Rev_{i,t-1}^{j}}\right) + (b_2 + c_2^{x} X_{i,t}^{j}) d_{i,t}^{j} log\left(\frac{Rev_{i,t}^{j}}{Rev_{i,t-1}^{j}}\right) + \varepsilon_{i,t} \qquad \text{Eq. (2)}$$

where $X_{i,t}^{j}$ represents a vendor of observable determinants of cost asymmetry. Prior literature includes in the vendor $X_{i,t}^{j}$ the following determinants: (a) the log of the ratio of number of employees ($Emp_{i,t}^{j}$) to sales revenue ($Rev_{i,t}^{j}$) and the log of the ratio of total assets ($Assets_{i,t}^{j}$) to sales revenue ($Rev_{i,t}^{j}$) of firm i classified in j industry in year t, as measures of a firm's employee intensity and asset intensity respectively (Anderson et al. 2003), (b) managerial anticipations for future sales are modeled with the dummy variable $ds_{i,t}^{j}$that takes the value of

1 if firm's sales revenue decreases for two consecutive periods, and 0 otherwise, (c) the effect of macroeconomic activity on the sticky cost phenomenon is modelled with the variable $GNP_{i,t}^{j}$, which is the percentage growth in real Gross National Product during year t and (d) managerial empire building behavior is modeled with the variable $FCF_{i,t}^{j}$ which represents the free cash flows of firm i classified in j industry in year t. Free cash flows are measured as cash flow from operating activities minus common and preferred dividends scaled by total assets (Chen et al., 2012).

Data

We explore the effect of strategy on the sticky behavior of SG&A expenses by using a data sample of 27.708 firm-year observations of US listed firms for the period 1991-2014 (obtained by North America Compustat database). For comparability reasons, financial firms (4-digit SIC codes 6000-6999) are excluded. The effect of outliers is eliminated from our analysis by winsorizing each individual data element to the 1st and 99th percentile of its sample distribution (Balakrishnan et al. 2004; Banker et al. 2013). Following the recommended by asymmetric cost literature data reduction methodology, we discard (i) the observations where SG&A expenses are greater than sales revenue, (ii) the observations for firms that have no positive sales revenues and SG&A costs and (iii) the observations where SG&A expenses move in the opposite direction to sales (Anderson, & Lanen 2009; Chen et al., 2012). In the same line, we eliminate those firm-years in which the revenue changes by more than 50% from one year to the next in order to remove the effects of mergers, acquisitions and divestitures[3].

3. The empirical models have been estimated and the robustness tests have been performed by employing the entire data sample without applying the standard data elimination procedure (i.e. observations where SG&A expenses are greater than sales revenue and observations for firms that have no positive sales revenues and SG&A costs, firm-years in which the revenue changes by more than 50% from one year to the next and

- Insert Table 1-

Results

Strategy and sticky behavior of SG&A expenses

We applied Petersen's (2009) methodology for selecting the most appropriate estimation procedure for the models of Eq. (1) and Eq. (2). Due to the presence of firm effect, the models of Eq. (1) and Eq. (2) were estimated by using firm-clustered standard errors to control for autocorrelation and heteroscedasticity. The models of Eq. (1) and Eq. (2) are estimated for both defenders and prospectors. Results are reported in Tables 2 and 3. Further, in the results that are reported in Table 2, multicollinearity is not a major concern because the variance inflation factor (VIF) for the asymmetric coefficient is less than 2.5.

In the case of firms classified as prospectors, the estimated value of coefficient b_1 of 0.523 indicates that SG&A costs increased by 0.523% per 1% annual increase in sales. The estimated value of coefficient b_2 of -0.359 provides strong evidence for SG&A cost stickiness behavior. The sum of the estimated values of b_1 and b_2 (b_1+b_2) is 0.164 which indicates that SG&A costs fall by 0.164% for a 1% decrease in sales. This is consistent with Anderson et al's (2003) seminal paper. However, the aforementioned pattern is reversed in the case of firms classified as defenders, which exhibit SG&A cost anti-stickiness behavior. The estimated value of b_1 of 0.122 indicates that SG&A costs rise by 0.122% for a 1% increase in sales. The estimated value of b_2 of 0.036 provides strong support of SG&A cost anti stickiness behavior. The sum of the estimated values of b_1 and b_2 (b_1+b_2) is 0.158 indicates that SG&A costs decreased by 0.158% per 1% decrease in sales revenue. The aforementioned analysis provides support that hypothesis 1 holds.

- Insert Table 2 -

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observations where SG&A expenses move in the opposite direction to sales). The aforementioned untabulated results are quite similar with the results reported by this study.

Table 3 presents the results of the regression analysis of the model of Eq. (3). After controlling for other determinants of cost asymmetry by means of the extended model, it seems that in the case of firms classified as defenders (prospectors), SG&A expenses exhibit cost anti-stickiness (cost stickiness) even if we take into consideration the effects of various contributing factors to the cost asymmetry. In the case of firms classified as defenders (prospectors), the estimated value of coefficient b_1 of 0.117 (0.770) indicates that an increase in sales revenues of 1% leads to an increase in SG&A costs by 0.117% (0.770%). The estimated value of b_2 of 0.056 (-0.340) provides strong support for SG&A cost anti-stickiness (stickiness) behavior. The combined value of b_1+b_2=0.173 (0.430) indicates that SG&A costs decreased by 0.173% (0.430%) per 1% decrease in sales revenue.

In the case of firms classified as prospectors, the estimated coefficients for firm's employee intensity (b_3=-0.130), managerial anticipations for future sales (b_5=-0.014), and managerial empire building behavior (b_7=-0.003) are significant and they have negative sign. It seems that the aforementioned factors increase the cost stickiness of SG&A expenses. This finding is in line with the nature of firms classified as prospectors. Their innovative and risk taking strategy is implemented by highly skilled managers which are associated with high levels of compensation, high levels of adjustment costs and their expectations for future sales revenues affect significantly their decisions for cost allocations. Further, in the case of firms classified as prospectors, the estimated coefficient for firm's asset intensity (b_4=0.034) has a positive sign. It seems that firms classified as prospectors which have a considerable asset intensity tend to reduce some part of SG&A expenses more drastically when sales are reduced. A plausible explanation is that when sales decrease, firms classified as prospectors tend to reallocate resources in favor of more strategically significant activities.

In the case of firms classified as defenders, the estimated coefficients for firm's employee intensity (b_3=-0.018), asset intensity (b_4=-0.067) and managerial anticipations for future sales

(b_5=-0.011) are significant and they have a negative sign. This finding indicates that the aforementioned factors increase the intensity of SG&A cost stickiness and it is consistent with previous empirical findings.

- Insert Table 3 -

For methodological reasons, we estimate the model of Eq. (2) by introducing the *STRATEGY* variable as interacting variable following Banker et al. (2013). We confirm that that firms pursuing a differentiation strategy exhibit greater cost stickiness as compared to firms pursuing a cost leadership strategy. This evidence is consistent with Banker et al. (2013).

- Insert Table 4 -

Alternative specifications of asymmetric cost behavior

In order to provide further support that a firm's strategic profile determines the direction of cost asymmetry in the case of SG&A expenses, we repeat our analysis using an approach which is proposed by Weiss (2010). Applying this methodology, we expect to verify our main finding that in the case of firms classified as prospectors (defenders), SG&A expenses are expected to exhibit sticky (anti-sticky) cost behavior.

According to Weiss' methodology (Weiss 2010), a direct measure of cost stickiness is calculated as the difference between the change in costs scaled by sales computed in recent quarters with sales decrease; and the change in costs scaled by sales computed in recent quarters with sales increase:

$$STICKY_{i,t} = log\left(\frac{\Delta SG\&A}{\Delta SALE}\right)_{i,T(-)} - log\left(\frac{\Delta SG\&A}{\Delta SALE}\right)_{i,T(+)}, T(-), T(+) \in \{t, \dots, t-3\} \quad \text{Eq. (3)}$$

Where *T(-)* is the most recent quarter that the firm records a sales decrease, *T(+)* is the most recent quarter that the firms records a sales increase, *ΔSG&A* is the difference between the SG&A expenses in year t and those in the previous year; and *ΔSALE* is the difference between sales revenue in year t and that of the previous year.

Table 5 illustrates the results of Weiss' methodology (Weiss, 2010). In the case of firms classified as prospectors, the mean value of the variable *STICKY* is -0.039 which is evidence in favor of sticky cost behavior. In the case of firms classified as defenders, the mean value of the variable *STICKY* is 0.065 which is indicative of cost anti-stickiness behavior.

- Insert Table 5 -

Robustness tests

The validity of our results is subject to two issues. The first issue concerns the discriminative power of the *STRATEGY* variable to separate firms to groups of different strategic profile. The second issue concerns the direction of causality between a firm's strategic position and its SG&A cost behavior.

In order to test the discriminative power of the *STRATEGY* variable we designed two tests. The first one relies on the underlining rationale that cost asymmetry should be more profound in special cases of expense items that are associated with specific strategic profiles. Thus, it is plausible to assume that if the results of our study will be validated in the aforementioned special cases of expense items for the firms classified to specific strategic profiles according to the *STRATEGY* variable, then the discriminative power of the *STRATEGY* variable is high. The second one employs Bayesian analysis to test the significance of the employed econometric specifications for cost asymmetry and to provide further insights of the discriminant power of the *STRATEGY* variable.

The examination of the direction of causality between a firm's strategic position and its SG&A cost behavior attempts to examine to what extent the reported evidence of this study are subject to alternative explanations. For instance, it is possible that a firm determines its strategic position based on the cost behavior of various cost elements or that a firm's intensity on intangible assets is the primary determinant of both its strategic orientation and the cost

behavior of various cost elements. For this reason, we performed various Granger causality tests.

Strategy and sticky behavior of advertising expenses

A plausible assumption is that advertising activities have an essential role in the implementation of the strategy of a firm adopting a prospector strategy. Thus, if the *STRATEGY* variable has the ability to distinguish firms as prospectors versus defenders, then in the case of firms classified as prospectors according to the *STRATEGY*, variable advertising expenses are expected to exhibit cost stickiness.

Table 6 illustrates the results of the regression analysis of the model of Eq. (2) with dependent variable in the level of advertising expenses ($Advert_{i,t}^{j}$) of firm i operating in j industry in year t. It seems that in the case of firms classified as prospectors (defenders) according to the *STRATEGY* variable, advertising expenses exhibit cost stickiness. In the case of firms classified as prospectors (defenders), the estimated value of coefficient b_1 of 0.548 (0.182) indicates that advertising expenses increased by 0.548% (0.182%) per 1% increase in sales revenue defined for one-year periods. The estimated value of b_2 of -0.273 (0.014) provides strong support that advertising expenses exhibit cost stickiness (anti-stickiness) behavior. The combined value of $b_1+b_2=0.275$ (0.196) indicates that advertising expenses decreased by 0.196% (0.275%) per 1% decrease in sales revenue.

- Insert Table 6 –

Table 7 illustrates the results of the regression analysis of the model of Eq. (2) with dependent variable in the level of advertising expenses ($Advert_{i,t}^{j}$) of firm i operating in j industry in year t, including the *STRATEGY* variable as interacting variable. We confirm that firms pursuing a differentiation strategy exhibit greater cost stickiness in the case of advertising

expenses as compared to firms pursuing a cost leadership strategy. This evidence is consistent with Banker et al. (2013).

- Insert Table 7 –

Bayesian hypothesis testing for regression models of asymmetric cost behavior of SG&A expenses

In this section, we attempt to introduce Bayesian analysis in our research design. Bayesian analysis assumes that the observed data sample is fixed but model parameters are random. The observed data and the prior distribution of parameters are employed to infer the posterior distribution of parameters. The frequentist approach assumes that the observed data are repeatable but parameters (although unknown) are fixed across repeated data samples.

The Bayesian analysis can be employed in order to further test some dimensions of the discriminative power of the *STRATEGY* variable. We expect that the *STRATEGY* variable splits our data sample in such a way by establishing a data selection process which does not introduce unknown or irrelevant information in our research design. Note that the underlining assumption of this study is that cost asymmetry is present regardless a firm's strategic orientation but the latter determines the direction of cost asymmetry (i.e. stickiness versus anti-stickiness). Thus, adopting the Baysenian assumption that the observed data sample is fixed but model parameters are random and defining as model parameters the alternative econometric specifications of the sticky cost phenomenon; we expect that the Baysenian likelihood of occurrence of the alternative econometric specifications of the sticky cost phenomenon to exhibit a similar pattern between the full data sample of our study and the two data subsamples of firms classified as prospectors or as defenders according to the *STRATEGY* variable. Otherwise, the *STRATEGY* variable filters our data by introducing a bias

in the formulation of the two separate data samples corresponding to firms with different strategic orientation[4].

Adjusting the Bayesian analysis in our research design, the different econometric extensions of Anderson et al.' s basic model (2003) for cost asymmetry can be viewed as random parameters and we can perform model comparison by evaluating the posterior probability of each selected model assuming that our data sample is fixed. Initially, we define the following four model specifications for cost asymmetry:

Simple model:

$$log\left(\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}}\right) = b_0 + b_1 log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + b_2 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + \varepsilon_{i,t}$$

Extended model 1:

$$log\left(\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}}\right) = b_0 + b_1 log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + b_2 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + b_3 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) log\left(\frac{Emp_{i,t}}{Rev_{i,t}}\right) + \varepsilon_{i,t}$$

Extended model 2:

$$log\left(\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}}\right) = b_0 + b_1 log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + b_2 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + b_3 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) log\left(\frac{Emp_{i,t}}{Rev_{i,t}}\right) + b_4 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) log\left(\frac{Assets_{i,t}}{Rev_{i,t}}\right) + \varepsilon_{i,t}$$

Full model:

$$log\left(\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}}\right) = b_0 + b_1 log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + b_2 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + b_3 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) log\left(\frac{Emp_{i,t}}{Rev_{i,t}}\right) + b_4 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) log\left(\frac{Assets_{i,t}}{Rev_{i,t}}\right) + b_5 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) ds + b_6 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) GNP + b_7 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) FCF + b_8 log\left(\frac{Emp_{i,t}}{Rev_{i,t}}\right)$$

4. A less desired attribute for the *STRATEGY* variable is to introduce a systematic and uniform error for the two separate data samples. In that case, the inclusion of any irrelevant information is expected to have limited impact on our research design.

$$+b_9 log\left(\frac{Assets_{i,t}}{Rev_{i,t}}\right) + b_{10} ds + b_{11} GNP + b_{11} FCF + \varepsilon_{i,t}$$

Where:

$Rev^{j}_{i,t}$ = The sales revenues of firm i operating in j industry in year t.

$SG\&A^{j}_{i,t}$ = The SG&A expenses of firm i operating in j industry in year t.

$ds^{j}_{i,t}$ = A dummy variable that takes the value of 1 if firm's sales revenue decreases for two consecutive periods, and 0 otherwise.

$Assets^{j}_{i,t}$ = The total assets of firm i operating in j industry in year t.

$Emp^{j}_{i,t}$ = Number of employees of firm i operating in j industry in year t.

$GNP^{j}_{i,t}$ = The percentage growth in real Gross National Product during year t.

$FCF^{j}_{i,t}$ = Free cash flows of firm i operating in j industry in year t.

The simple model corresponds to the Anderson et al.'s basic model (2003) of Eq. (1). The extended model 1 includes the employee intensity (i.e. the log ratio of number of employees to sales revenues) as a slope determinant of cost asymmetry and the extended model 2 includes both the employee intensity and asset intensity (i.e. the log ratio of total assets to sales revenues) as slope determinants of cost asymmetry. These are the initial extensions of the basic model proposed by the sticky cost literature. The full model corresponds to Anderson et al.'s extended model (2003) of Eq. (2).

Table 8 reports the results of Bayesian model comparison for the full sample of our study and the two subsamples of firms classified as prospectors or as defenders according to the *STRATEGY* variable. The results of Bayesian model comparison for the full sample indicate that the simple model is likely with a posterior probability of 0.10 which is very unlikely compared with other models. The extended model 1 and the extended model 2 are likely with probabilities of 0.21, 0.23 and the full model has the highest posterior probability of 0.44.

Thus, the Anderson et al.'s extended model (2003) of Eq. (2) exhibits the maximum posterior probability across different model specifications of asymmetric cost behavior.

In the case of the subsample of firms classified as prospectors (defenders) the simple model is likely with a posterior probability of 0.11 (0.07) which is very unlikely compared with other models. The extended model 1 and the extended model 2 are likely with probabilities of 0.18 (0.16), 0.29 (0.21) and the full model has the highest posterior probability of 0.42 (0.56).

- Insert Table 8 –

The aforementioned reported results of the Baysenian analysis indicate that the likelihood of occurrence of the alternative econometric specifications of the sticky cost phenomenon exhibit a similar pattern between the full data sample of our study and the two data subsamples of firms classified as prospectors or as defenders according to the *STRATEGY* variable. It seems that each subgroup of data corresponding to different strategic profile conveys information about cost asymmetry which is quite similar with the information of the full sample of our study.

Cost asymmetry, strategy and intangible resources

This section analyses the direction of the causality between cost asymmetry, strategy and intangible resources. Our primary research hypothesis is that a firm's strategic orientation affects managerial resource allocation decisions and hence the intensity and the direction of SG&A cost asymmetry. However, the other direction of causality may also be plausible, that is, firms with a sticky cost structure might choose a strategic orientation that is suitable for their cost structure and behavior. In addition, previous empirical research documents that firms with high levels of intangible resources tend to exhibit SG&A cost stickiness (Venieris et al. 2015). Intangible resources are valuable strategic resources for firms classified as prospectors. Thus, an alternative explanation of the observed cost stickiness of SG&A

expenses in the case of firms classified as prospectors is that these firms tend to exhibit high intensity on intangible resources which might be the primary cause of the observed cost stickiness of SG&A expenses.

In order to examine the relation between a firm's strategic orientation and its intensity on intangible resources, we focused on organizational capital[5] as a primary variable of a firm's intensity on intangible investments. A plausible assumption is that firms classified as prospectors invest a considerable amount of resources in the development of organization capital. We expect that in the case of firms with high (low) levels of organization capital, the *STRATEGY* variable will classify them as prospectors (defenders). For this reason, following Venieris et al. (2015), we employed the *ORGANIZATIONAL CAPITAL* variable defined as the median value of the originally proposed by Lev, Radhakrishnan, and Zhang (2009) variable for measuring the economic value of the organization capital of i firm operating in j industry in year t (for details see Appendix B).

We limit our analysis on firms with low and high organization capital intensity which corresponds to the lowest and highest quantile of the *ORGANIZATIONAL CAPITAL* distribution. For each quantile, we have calculated the mean and the median value of the *STRATEGY* variable. The results are reported on Table 9 (Panel A). It seems, that in the case of firms with low organizational capital intensity, the median (mean) value of the *STRATEGY* variable is 9.12 (9.34) which corresponds to a firm classified as a defender. On the other hand,

5. According to Lev et al. (2009), organization capital is the most significant unreported intangible asset. Organization capital includes capabilities and knowledge used to combine human skills and physical capital into systems for producing and delivering want-satisfying products. It also includes elements such as organizational culture, values, attitudes, structure, information and telecommunications technology (Martin de Castro et al., 2011).

in the case of firms with high organizational capital intensity, the median (mean) value of the *STRATEGY* variable is 25.05 (25.42) which corresponds to a firm classified as a prospector.

- Insert Table 9 –

In light of the aforementioned empirical finding the relation between strategy, intensity on intangible investments and SG&A cost stickiness should be clarified. Table 7 (Panel B) reports the estimation results of various panel vector autoregressive models (Gujarati 2004). As a measure of SG&A cost asymmetry, we employed the *STICKY* variable of Eq. (3). We employed the *STRATEGY* variable without excluding firms characterized as analyzers[6]. Finally, a firm's intensity on intangibles investments was measured using two different measures: the *ORGANIZATIONAL CAPITAL* variable and the *MA-Score* (Demerjian, Lev, & McVay, 2012).

MA-Score is proposed by Demerjian et al. (2012) as a quantitative measure of a firm's level of managerial ability and it is calculated by employing a two-stage methodology for deriving a proxy of a firm's managerial ability. First, a data envelopment analysis (DEA) with a single output and seven inputs[7] is used to calculate a firm's relative efficiency using (see Appendix C). The second stage includes an estimation of a Tobit regression model including year fixed effects and clustering standard errors by firm and year to control for cross-sectional and inter-temporal correlation. According to Demerjian et al. (2012), the residual of the Tobit

6. If we exclude the firms classified as analyzers, the *STRATEGY* variable will receive values from 6 to 12 and from 24 to 30. In that case, the estimated coefficients of *STRATEGY* variable might be inconsistent.

7. The seven inputs are: (i) net property, plant, and equipment, (ii) capitalized operating leases, (iii) net research and development (R&D), (iv) goodwill reported on the balance sheet, (v) other than goodwill acquired and capitalized intangibles, also reported on the balance sheet, (vi) cost of goods sold and (vii) selling general and administrative expenses.

regression model is the level of the managerial ability $MA - Score^{j}_{i,t}$. of firm i operating in j industry in year t (for details see Appendix C).

We employed two different measures of a firm's intensity on intangible investments for a number of reasons. The *ORGANIZATIONAL CAPITAL* variable has been employed by previous research within the field of asymmetric cost behavior as an indicator of a firm's intensity on intangible investments. Due to its broad nature of organizational capital and our research focus on the relation of a firm's strategic profile with SG&A asymmetric cost behavior, we adopted *MA-Score* as a more specialized and relevant measure of a firm's intensity on intangible investments than *ORGANIZATIONAL CAPITAL* variable because the level of managerial ability is a specialized dimension a firm's level of organizational capital closely associated with effective implementation of a firm's strategy.

Table 9 (Panel B) reports the regression results of various panel vector autoregressive models. It seems that the lag values of the *STRATEGY* variable contain information that enables predicting the level of the *STICKY* variable beyond the information contained in the past values of the *STICKY* variable (Model 1 and Model 2). It also seems that the lag values of *ORGANIZATIONAL CAPITAL* variable and MA-score contain information that enables predicting the level of the *STICKY* variable beyond the information contained in the past values of the *STICKY* variable. On the other hand, the lag value of the *STICKY* variable has no significant effect on the level of the *STRATEGY* variable or on the level of a firm's intensity on intangible investments in the current period.

In order to further examine the direction of causality, we performed various Granger causality tests. Results are reported on Table 9 (Panel C) between *STICKY, STRATEGY, ORGANIZATIONAL CAPITAL* and *MA – Score*. It seems that the null hypothesis that *STRATEGY* does not Granger cause *STICKY* can be rejected at the 0.1 % level (Model 1) or at the 2.1 % level (Model 2).

The aforementioned empirical evidence indicates that the asymmetric cost behavior of SG&A expenses is an expression of a firm's strategic orientation. The effects of a firm's strategic decisions on the asymmetric cost behavior of SG&A expenses are independent from firm's intensity on intangible resources in the sense that decisions on the level intangible resources in past seem not to have significant effects on strategic decisions in the present.

Cost asymmetry, strategy and market concentration

Managerial resource commitment decisions are subject to context specific constraints (Banker et al., 2017). Li and Zheng (2017) have examined the effects of a product market competition, which is a critical dimension of the external business environment, on the asymmetric cost behavior of the operating costs. More specifically, they find strong evidence consistent with cost asymmetry increasing in competition after controlling for known economic determinants of cost stickiness. A recent development on real option theory (Grenadier, 2002) that for a firm with monopolistic access to a project, the option to wait can be quite valuable; however, the presence of competition quickly erodes the value of the option to wait. Li and Zheng (2017) based on aforementioned development with the field of real option theory argue that when firms faced with competition, they regularly spend resources to strengthen their competitive positions in their product market and such expenditures may appear in the form of cost stickiness.

The empirical results of this study should be tested in the light of the intensity of the market competition. Strategy is (or should be) shaped as a response to environmental challenges. This is the intuition that drives the generic strategic typologies such as these proposed by Porter (1980) or Miles and Snow (1978; 2003).

We calculate the Herfindahl–Hirschman Index as a sales based concentration index (MC variable) for each three-digit SIC industry year based on our available data set. The Herfindahl–Hirschman Index is calculated using the Compustat public firms of our data

sample. Initially, we estimated Eq. (2) including the variable MC for defenders and prospectors separately. Table 10 reports the estimated results.

– Insert Table 10 –

It seems that in both the case of defenders and prospectors the estimated coefficient b_8 is negative. The significantly negative value of coefficient b_8 (market concentration) indicates that in the case of firms classified as prospectors (defenders) a decrease in competition increase (decrease) the degree of cost stickiness (antistickiness). Our findings are in the opposite direction of the results reported by Li and Zheng (2017). Seeking for alternative explanations, one might suggest that firms competing in markets with high concertation and lower competition tend to spend resources to retain their market share and to create barriers towards new entrants. In addition, relatively increased market shares might be anchored with more optimistic managerial expectations regarding whether future sales volume will absorb the slack of unutilized resources.

In order to investigate the effects of strategy on the asymmetric cost behavior of SG&A expenses under the presence of market concentration, we separate our data sample into two sub samples each one corresponding to firms operating within business environments with low and high market concentration and we estimated the Eq. (2) including the *STRATEGY* variable as interacting variable. We separate our data sample into two sub samples each one corresponding to firms operating within business environments with low and high market concentration. A firm is classified as operating within a business environment of low (high) market concentration if the median value of its corresponding Herfindahl–Hirschman Index is within the lowest (highest) quintile of the distribution of the median values of the Herfindahl–Hirschman Index. Table 11 reports the estimated results.

– Insert Table 11 –

It seems that regardless the intensity of market concentration, SG&A expenses exhibit cost stickiness. However, in the case of firms operating within a business environment of low market concentration, the intensity of cost stickiness (i.e., estimated coefficient b_2) is lower than in the case of firms operating within a business environment of high market concentration. In addition, a firm's strategic profile affects the intensity of the asymmetric cost behaviour of SG&A expenses but the level of competition seems to moderate this effect. In the case of firms operating within a business environment of a low market concentration the estimated coefficient b_8 of the *STRATEGY* variable is -0.014 whereas in the case of firms operating within a business environment of a high market concentration the corresponding estimated value is -0.146. A plausible explanation might be that the increased competition lowers the relative efficiency deviation between alternative strategic profiles and, thus, the underlining managerial behavior that drives cost stickiness.

Finally, in order to evaluate the effects of both strategy and market concentration on the asymmetric cost behaviour of SG&A expenses, we estimated the Eq. (2) including the *STRATEGY* variable and *MC* variable as interacting variables. Table 12 reports the estimated results.

– Insert Table 12 –

It seems that both strategy and market concertation increase the intensity of cost stickiness in the case of SG&A expenses. However, estimated coefficient (b_8) of the STRATEGY variable is significantly greater than the corresponding coefficient (b_9) of the MC variable.

Summarizing the aforementioned analysis, it seems that low market concentration moderates the effects of strategy on the intensity of the cost stickiness in the case of SG&A expenses. In any case, strategy remains a significant factor contributing on the intensity of the cost stickiness of SG&A expenses.

Cost asymmetry, strategy, optimistic and pessimist scenario

Banker et al. (2013) examined the relation between cost asymmetry and strategy under optimistic and pessimistic scenario. More specifically, based on Banker et al. (2014) estimated the following Eq. (4a) and Eq. (4b):

$$\begin{aligned} log\left(SGA_{i,t}^{j}/SGA_{i,t-1}^{j}\right) = {} & b_0 + b_1^{OPT} I_{t-1}\ log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) \\ & + b_2^{OPT} I_{t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_1^{PES}\, d_{i,t-1} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) \\ & + b_2^{PES} d_{i,t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + \varepsilon_{i,t}. \end{aligned} \qquad \text{Eq. (4a)}$$

$$\begin{aligned} & log\left(SGA_{i,t}^{j}/SGA_{i,t-1}^{j}\right) = b_0 + b_1^{OPT} I_{t-1}\ log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) \\ & + b_2^{OPT} I_{t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) \\ & + b_3^{OPT} I_{t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) STRATEGY_{i,t} \\ & + b_1^{PES}\, d_{i,t-1} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) \\ & + b_2^{PES} d_{i,t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_3^{PES} d_{i,t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) STRATEGY_{i,t} \\ & + \varepsilon_{i,t} \end{aligned} \qquad \text{Eq. (4b)}$$

Where $I_{i,t}$ is a dummy variable which equals 1 if sales of firm i increased in year t and 0 otherwise, $I_{i,t-1}$ is a dummy variable which equals 1 if sales of firm i increased in year t-1 and 0 otherwise, $d_{i,t}$ is a dummy variable which equals 1 if sales of firm i decreased in year t and 0 otherwise, and $d_{i,t-1}$ is a dummy variable which equals 1 if sales of firm i decreased in year t-1 and 0 otherwise. Finally, $STRATEGY_{i,t}$ is a variable ranging from 6 to 30 and it is used to denote a firm's strategic profile.

The estimation results of the Eq. (4b) are reported in Table 13. It seems that firms tending to follow a prospecting strategy exhibit greater cost stickiness (the estimated coefficient b_3^{OPT} equals to -0.146) under the optimistic scenario and lower cost anti stickiness under pessimistic scenario (the estimated coefficient b_3^{PES} equals to -0.034). The results are consistent even we take into consideration the intensity of market concentration (see Table 14).

– Insert Table 13 and 14 –

In an attempt to examine to what extent strategy affects the direction of the effects of the pessimistic and optimistic scenario on cost asymmetry of the SG&A expenses; we estimated Eq. (4a) for defenders and prospectors separately. Table 15 reports the estimated results.

– Insert Table 15 –

In the case of firms classified as defenders, there is a systematic cost anti stickiness behavior both in case of optimistic and pessimistic scenario. On the other hand, in the case of firms classified as prospectors, there is a systematic cost stickiness behavior both in case of optimistic and pessimistic scenario. Thus, the strategy affects the direction of cost asymmetry regardless the scenario that managers experience.

Conclusions

The current study contributes to the strategic cost management by examining the relation between sticky cost phenomenon and business strategy. Cost asymmetry is an emerging stream of management accounting research which examines how managerial deliberate commitment decisions affect cost behavior. We expanded this understanding by investigating the role of business strategy on intensity and the direction of cost asymmetry in the case of SG&A expenses.

Our findings support Anderson et al.'s (2003) fundamental insight that cost stickiness reflects deliberate resource commitment decisions made by managers. However, our analysis identifies a new theoretical factor that drives both cost stickiness and cost anti-stickiness. The current study expands the empirical evidence reported by Banker et al. (2013), in the sense that provides theoretical and empirical evidence that a firm's strategic position determines not only the intensity of asymmetric cost behavior (Banker et al., 2013) but also its direction. More specifically, we documented that firms classified as prospectors exhibit SG&A cost stickiness whereas firms classified as defenders exhibit slightly SG&A cost anti-stickiness. We use a classification (Miles and Show's typology), which, within the context of accounting

and finance research initiatives, facilitates the implementation of quantitative research designs and enables us to achieve wider theoretical validity of our research findings (Bentley et al. 2013). We, also, document that the strategy affects the direction of cost asymmetry regardless the scenario that managers experience.

In the attempt to test the robustness of our empirical results, we provide further insights that, in the case of SG&A expenses, the presence of asymmetric cost behavior does not Granger cause a firm's strategic positioning or its intensity on intangible evidence. It seems that a firm's decisions on its strategic positioning and its portfolio of strategic intangible resources precede resource allocation decisions that are associated with cost behavior. Thus, the presence of asymmetric cost behavior seems to be an outcome of managerial decisions and not a primary cause of a firm's strategic positioning. Additional robustness tests concerning the degree of market concentration indicate that strategy remains a significant contributing factor concerning the intensity of cost asymmetry in the case of SG&A expenses under the presence of different levels of market concentration.

The above empirical evidence for the relation between SG&A cost asymmetry and business strategy is also timely in the context of management and financial accountants' needs for better understanding of cost behavior. Our study emphasizes that in order to analyze the SG&A cost behavior and its economic consequences on a firm's operating performance, we must take into consideration the firms' perspective to be innovative market leaders in numerous domains, compared with firms that maintain a narrow and stable product focus to compete on the basis of price, service or quality. SG&A cost stickiness (anti-stickiness) in a temporally sales decline, seems to be a proper cost reaction in the case of a firm classified as a prospector (defender) in order to be consistent with its strategic orientation and to maintain adequate levels of operating performance in the future. Further, it seems that within each firm's strategy type, the managers' ability to be more knowledgeable about the firm and the

industry as well as to be better able to synthesize information into reliable forward-looking estimates, is crucial regarding their deliberate commitment decisions that affect cost stickiness. Consequently, any hasty conclusion that a disproportionate increase/decrease in SG&A expenses is a negative signal of a firm's operation may be misleading, because this cost behaviour may be due to the firms' orientation.

Appendix A. Classification of firm strategy (Bentley et al. 2013)

This Appendix illustrates the calculation of the *STRATEGY* measure as it is described by Bentley et al. (2013). The *STRATEGY* measure is a construction of six individual variables. Each of the variables is measured per company-year based on the rolling prior five-year average and is ranked into quintiles per industry (2-digit SIC) as well as per year. The observations are given score from 1 (low) to 5 (high) based on the quintile they belong to (except capital intensity which is a reversed-scored). The individual scores of the six variables are summarized per company year to compose the *STRATEGY* measure. Thus, the *STRATEGY* measure ranges from 6 to 30. Bentley et al. (2013) follow stick definitions of *STRATEGY*-types: defenders (6-12), analyzers (13-23) and prospectors (24-30). The individual variables that composite STRATEGY measure are:

Variable Name:	Measurement:
Company's propensity to search for new products	Ratio of research and development expenditures (Compustat data item #46) to sales (Compustat data item #12) over a rolling prior five-year average.
Company's ability to produce and distribute products and services efficiently	Ratio of the number of employees (Compustat data item #29) to sales (Compustat data item #12) over a rolling prior five-year average.
Company's historical growth or investment opportunities	One-year percentage change in total sales (Compustat data item #12) computed over a rolling prior five-year average.
Company's focus on exploiting new products and services	Ratio of selling, general and administrative expenses (Compustat data item #189) to sales (Compustat data item #12) over a rolling prior five-year average.

Company's organizational stability	Standard deviation of the total number of employees (Compustat data item #29) computed over a rolling prior five-year period).
Company's commitment to technological efficiency	Capital intensity which is measured as net PPE (Compustat data item #30) scaled by total assets computed over a rolling prior five-year average.

Appendix B. Estimation of organization capital (Lev et al. 2009)

Organization capital was quantified by employing the methodology proposed by Lev et al. (2009). This Appendix presents the analytical steps for the calculation of organizational capital as they are described by Lev et al. 2009.

The economic value of the organization capital ($OC_{i,t}^{j}$) of firm i operating in j industry in year t, is measured as a firm's abnormal profits capitalised and amortized over the last five years scaled by the total assets of the firm (Compustat data item #6). The sum of the contribution of $OC_{i,t}^{j}$ to revenues ($AbSA_{i,t}^{j}$) and to cost containment ($AbCO_{i,t}^{j}$) is abnormal profit of firm i operating in j industry in year t.

$AbSA_{i,t}^{j}$ are the abnormal revenues of firm i in year t, and it is calculated as the difference between a firm's actual and predicted revenues according to the average efficiency without organization capital. Revenues are modeled with the following econometric specification:

$$Rev_{i,t}^{j} = a_{0,i,t}^{j} Emp_{i,t}^{j\,a_{2,i,t}^{j}} PPE_{i,t}^{j\,a_{3,i,t}^{j}} e_{i,t}^{j} \qquad \text{Eq. (2.1)}$$

$Rev_{i,t}^{j}$ is the annual revenue (Compustat data item #12); $Emp_{i,t}^{j}$ is the number of employees (Compustat data item #29); and $PPE_{i,t}^{j}$ is the net plant, property and equipment (Compustat data item #30) of firm i operating in j industry in year t. Coefficients $a_{0,i,t}^{j}$, $a_{2,i,t}^{j}$ and $a_{3,i,t}^{j}$ of

Eq. (2.1) are obtained by estimating (annually and cross-sectionally for each industry setting) the following model of Eq. (A2):

$$log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) = a_{0,i,t}^{j} + a_{1,i,t}^{j}\, log\left(SG\&A\_C_{i,t}^{j}/SG\&A\_C_{i,t-1}^{j}\right)$$

$$+ a_{2,i,t}^{j}\, log\left(Emp_{i,t}^{j}/Emp_{i,t-1}^{j}\right) + a_{3,i,t}^{j} log(PPE_{i,t}^{j}/PPE_{i,t-1}^{j}) + \quad \text{Eq. (2.2)}$$

$$log(e_{i,t}^{j}/e_{i,t-1}^{j})$$

$SG\&A\_C_{i,t}^{j}$ is the annual SG&A expenses (Compustat data item #189) capitalized and amortized over the last three years. $AbCO_{i,t}^{j}$ is calculated as the difference between a firm's actual costs (Compustat data item #12 minus data item #178) and the predicted costs according to the average efficiency without organization capital. The calculation of the variable $AbCO_{i,t}^{j}$ is similar with the calculation of the variable $AbSA_{i,t}^{j}$ using the operating cost of firm i operating in j industry in year t ($Cost_{i,t}^{j}$), as the dependent variable in Eq. (2.2).

Appendix C. Estimation of MA-Score (Demerjian et al. 2012)

This Appendix describes the calculation of the *MA-score* as it is described by Demerjian et al. 2012. Initially, Demerjian et al. (2012) employed data envelopment analysis (DEA) to calculate a firm-specific relative efficiency using a single output and seven inputs. Total sales revenue is the output, since the principal objective of the firm is to produce sales. The cost of producing the sales is captured by the seven inputs. The first five inputs correspond to assets the company invests in that are expected to affect their revenue-generation:

(1) Net Property, Plant, and Equipment (Compustat data item #30).

(2) Capitalized Operating Leases. The discounted present value of the next five years of required operating lease payments (available in the firm's footnotes to the financial statements and on Compustat data item #37).

(3) Net Research and Development (R&D). The R&D expense (Compustat data item #46) capitalized and amortized over a five-year period.

(4) Goodwill, reported on the balance sheet (Compustat data item #204). Goodwill generally reflects the value of the acquired intangible assets.

(5) Other than goodwill acquired and capitalized intangibles, also reported on the balance sheet which includes items such as client lists, patent costs, and copyrights.

Demerjian et al. (2012) also include two year t expenses, Cost of Goods Sold and Selling General and Administrative Expense to account for the cost of inventory (Cost of Goods Sold) and sales generated from advertising and the quality of the sales force (advertising, training costs and IT services are included in SG&A).

DEA efficiency is estimated by industry (Fama and French, 1997), to increase the likelihood that the peer firms have similar business models and cost structures within the estimations. The resulting score ranges from 0–1, with 1 being the optimal output for a given mix of inputs.

The second stage of MA-score includes an estimation of a Tobit regression model including year fixed effects and clustering standard errors by firm and year to control for cross-sectional and inter-temporal correlation:

$$\begin{aligned} Firm\_Efficiency_{i,t}^{j} = {} & a_{0,i,t}^{j} + a_{1,i,t}^{j}\, log\left(Total\_Assets_{i,t}^{j}\right) \\ & + a_{2,i,t}^{j} Free\_Cash\_Flow\_Indicator_{i,t}^{j} + a_{3,i,t}^{j}\, log\left(Age_{i,t}^{j}\right) \\ & + a_{4,i,t}^{j} Business\_Segment\_Concentration_{i,t}^{j} \\ & + a_{5,i,t}^{j} Foreign\_Currency\_Indicator_{i,t}^{j} + a_{6,i,t}^{j} year_{i,t}^{j} + e_{i,t}^{j} \end{aligned} \qquad \text{Eq. (3.1)}$$

Total Assets is Compustat (*AT*- Compustat data item #120) at the end of year t. Market Share is the percentage of revenues (*SALE*- Compustat data item #12) earned by the firm within its Fama-French industry in year t. Free Cash Flow Indicator is coded to one when a firm has non-negative free cash flow (defined as earnings before depreciation and amortization *OIBDP*

- Compustat data item #13) less the change in working capital (*RECT*#2+*INVT*#3+*ACO*#68-*LCO*#72-*AP*#70) less capital expenditures (*CAPX* - Compustat data item #128) in year t. Firm Age is the number of years the firm has been listed on Compustat at the end of year t. Business Segment Concentration is the ratio of individual business segment sales to total sales, summed across all business segments for year t. If the firm is not in the segment file, it is assigned to a concentration of one. Foreign Currency Indicator is coded to one when a firm reports a non-zero value for Foreign Currency Adjustment (*FCA*- Compustat data item #150) in year t.

According to Demerjian et al. (2012), the residual $e^{j}_{i,t}$ of Eq. (3.1) is the managerial ability $MA^{j}_{i,t}$. of firm i operating in j industry in year t.

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Tables

Table 1. Descriptive statistics of the main variables

Panel A: Sample selection

Sample	Observations Deleted	Observations Remaining
Initial sample: Firm-year observations with valid data on Compustat (1991-2014)	-	154,207
Exclude financial firms	37,530	116,677
Exclude the observations where SG&A expenses are greater than sales revenue and observations for firms that have no positive sales revenues and SG&A costs	22,982	93,695
Eliminate those firm-years in which the revenue changes by more than 50% from one year to the next	41,346	52,349
Discard observations where SG&A expenses move in the opposite direction to sales	24,641	27,708

Panel B: Main variables and their description

	Number of Observations	Mean	Median	Standard Deviation	Min	Max
$SG\&A_{i,t}^{j}$	27,708	438.44	49.98	1,072.64	0.08	5,839.00
$Rev_{i,t}^{j}$	27,708	1,583.98	286.87	2,937.79	4.91	25,995
$Assets_{i,t}^{j}$	27,708	2,280.83	232.84	5,437.80	5.00	56,025
$Emp_{i,t}^{j}$	27,708	21.24	2.65	33.44	0.01	115
$GNP_{i,t}^{j}$	27,708	2.90	2.80	3.25	-5.75	8.57
$FCF_{i,t}^{j}$	27,708	22.00	0.10	85.92	-135.56	835.24

Where:

$SG\&A_{i,t}^{j}$ = The SG&A expenses of firm i operating in j industry in year t.

$Rev_{i,t}^{j}$ = The sales revenues of firm i operating in j industry in year t.

$Assets_{i,t}^{j}$ = The total assets of firm i operating in j industry in year t.

$Emp_{i,t}^{j}$ = Number of employees of firm i operating in j industry in year t.

$GNP_{i,t}^{j}$ = The percentage growth in real Gross National Product during year t.

$FCF_{i,t}^{j}$ = Free cash flows of firm i operating in j industry in year t.

Table 2. Asymmetric cost behaviour of SG&A expenses and strategic orientation (basic model)

	Coefficient Estimates (t - stat)	
	DEFENDERS[a]	*PROSPECTORS*[b]
b_0: constant	0.099*	0.015***
	(1.78)	(2.87)
b_1: log($Rev_{i,t}/Rev_{i,t-1}$)	0.122***	0.523***
	(7.31)	(9.58)
b_2: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)	0.036***	-0.359***
	(4.15)	(-4.93)
Number of Observations:	3,250	4,125
Adj. R-Squared:	0.340	0.410

Notes:

This table presents the results of the regression analysis of the estimated model: $log\left(SG\&A_{i,t}^{j}/SG\&A_{i,t-1}^{j}\right) = b_0 + b_1 log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_2 d_{i,t}^{j} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + \varepsilon_{i,t}$. Following Petersen's (2009) methodology, the model is estimated by using firm-clustered standard errors to control for autocorrelation and heteroscedasticity.

*, **and *** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively.

[a] Denotes *DEFENDERS*: firms with a median value of *STRATEGY* variable ranging from 6 to 12.

[b] Denotes *PROSPECTORS*: firms with a median value of *STRATEGY* variable ranging from 24 to 30.

Variable Definitions:

$SG\&A_{i,t}^{j}$ = The annual *SG&A* expenses of firm i operating in j industry in year t.

$Rev_{i,t}^{j}$ = Sales Revenues of firm i operating in j industry in year t.

$d_{i,t}^{j}$ = A dummy variable which equals 1 if sales of firm i decreased in year t and 0 otherwise.

Table 3. Asymmetric cost behaviour of SG&A expenses and strategic orientation (extended model)

	Coefficient Estimates (t - stat)	
	DEFENDERS[a]	*PROSPECTORS*[b]
b_0 : constant	0.010***	0.021***
	(3.19)	(6.75)
b_1: log($Rev_{i,t}/Rev_{i,t-1}$)	0.117***	0.770***
	(2.29)	(38.77)
Two – Way Interaction Term		
b_2: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)	0.056**	-0.340***
	(2.12)	(-9.35)
Three – Way Interaction Terms		
b_3: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Emp_{i,t}/Rev_{i,t}$)	-0.018*	-0.130***
	(-1.73)	(-3.62)
b_4: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Assets_{i,t}/Rev_{i,t}$)	-0.067***	0.034***
	(-4.77)	(3.76)
b_5: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$ds_{i,t}$	-0.011*	-0.014*
	(-1.74)	(-1.71)
b_6: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*GNP_t	0.014***	0.036***
	(3.08)	(4.15)
b_7: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$FCF_{i,t}$	0.001	-0.003**
	(0.09)	(-2.44)
Main Terms		
b_9: log($Emp_{i,t}/Rev_{i,t}$)	0.122***	0.003***
	(7.31)	(2.67)
b_{10}: log($Assets_{i,t}/Rev_{i,t}$)	0.024***	0.007***
	(5.54)	(-4.33)
b_{11}: $ds_{i,t}$	-0.061***	-0.014***
	(-10.14)	(-10.86)
b_{12}: GNP_t	0.009***	0.001***
	(7.46)	(-2.59)
b_{13}: $FCF_{i,t}$	0.007	0.003***
	(1.41)	(2.67)
Number of Observations:	1,694	2,021
Adj. R-Squared:	0.198	0.261

Notes:

This table presents the results of the regression analysis of the estimated model $log\left(SG\&A_{i,t}^{j}/SG\&A_{i,t-1}^{j}\right) = b_0 + c_0^x X_{i,t}^{j} + (b_1 + c_1^x X_{i,t}^{j}) log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + (b_2 + c_2^x X_{i,t}^{j}) d_{i,t}^{j} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + \varepsilon_{i,t}$. Following Petersen's (2009) methodology, the model is estimated by using firm-clustered standard errors to control for autocorrelation and heteroscedasticity.

*, **and *** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively.

[a] Denotes *DEFENDERS*: firms with a median value of its *STRATEGY* variable ranging from 6 to 12.

[b] Denotes *PROSPECTORS*: firms with a median value of its *STRATEGY* variable ranging from 24 to 30.

$SG\&A_{i,t}^{j}$ = The annual SG&A expenses of firm i operating in j industry in year t.

$X_{i,t}^{j}$ is a vendor of observable determinants of cost asymmetry including the following variables:

$Rev_{i,t}^{j}$ = Sales revenues of firm i operating in j industry in year t.

$d_{i,t}^{j}$ = A dummy variable which equals 1 if sales of firm i in j industry in year t decreased in year t and 0 otherwise.

$Emp_{i,t}^{j}$ = Number of employees of firm i operating in j industry in year t.

$Assets_{i,t}^{j}$ = Total assets of firm i operating in j industry in year t.

$d_{si,t}^{j}$ = A dummy variable that takes the value of 1 if firm's sales revenue decreases for two consecutive periods, and 0 otherwise.

$FCF_{i,t}^{j}$ = Free cash flows of firm i operating in j industry in year t.

$GNP_{i,t}^{j}$ = The percentage growth in real Gross National Product during year t.

Table 4. Asymmetric cost behaviour of SG&A expenses and strategic orientation
(STRATEGY variable included)

	Coefficient Estimates (t - stat)
b_0 : constant	0.032***
	(3.88)
b_1: log($Rev_{i,t}/Rev_{i,t-1}$)	0.812***
	(39.74)
Two – Way Interaction Term	
b_2: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)	-0.336***
	(-9.95)
Three – Way Interaction Terms	
b_3: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Emp_{i,t}/Rev_{i,t}$)	0.054***
	(-5.93)
b_4: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Assets_{i,t}/Rev_{i,t}$)	0.037***
	(6.40)
b_5: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$ds_{i,t}$	-0.018*
	(-1.66)
b_6: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*GNP_t	0.035***
	(4.17)
b_7: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$FCF_{i,t}$	-0.013***
	(-11.68)
b_8: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$STRATEGY_{i,t}$	-0.194***
	(-5.37)
Main Terms	
b_9: log($Emp_{i,t}/Rev_{i,t}$)	0.003***
	(2.67)
b_{10}: log($Assets_{i,t}/Rev_{i,t}$)	0.007***
	(10.45)
b_{11}: $ds_{i,t}$	-0.015***
	(-8.95)
b_{12}: GNP_t	0.001*
	(1.85)
b_{13}: $FCF_{i,t}$	0.003***
	(2.67)
b_{14}: $STRATEGY_{i,t}$	-0.056***
	(-7.63)
Number of Observations:	6,493
Adj. R-Squared:	0.614

Notes:

This table presents the results of the regression analysis of the estimated model $log\left(SG\&A_{i,t}^{j}/SG\&A_{i,t-1}^{j}\right) = b_0 + c_0^x X_{i,t}^j + (b_1 + c_1^x X_{i,t}^j) log\left(Rev_{i,t}^j/Rev_{i,t-1}^j\right) + (b_2 + c_2^x X_{i,t}^j) d_{i,t}^j log\left(Rev_{i,t}^j/Rev_{i,t-1}^j\right) + \varepsilon_{i,t}$. Following Petersen's (2009) methodology, the model is estimated by using firm-clustered standard errors to control for autocorrelation and heteroscedasticity.

*, **and *** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively.

$SG\&A_{i,t}^{j}$ = The annual SG&A expenses of firm i operating in j industry in year t.

$X_{i,t}^{j}$ = A vendor of observable determinants of cost asymmetry including the following variables:

$Rev_{i,t}^{j}$ = Sales revenues of firm i operating in j industry in year t.

$d_{i,t}^{j}$ = A dummy variable which equals 1 if sales of firm i in j industry in year t decreased in year t and 0 otherwise.

$Emp_{i,t}^{j}$ = Number of employees of firm i operating in j industry in year t.

$Assets_{i,t}^{j}$ = Total assets of firm i operating in j industry in year t.

$d_{si,t}^{j}$ = A dummy variable that takes the value of 1 if firm's sales revenue decreases for two consecutive periods, and 0 otherwise.

$FCF_{i,t}^{j}$ = Free cash flows of firm i operating in j industry in year t.

$STRATEGY_{i,t}$ = A variable ranging from 6 to 30 and it is used to denote a firm's strategic profile.

$GNP_{i,t}^{j}$ = The percentage growth in real Gross National Product during year t.

Table 5. Asymmetric cost behaviour of SG&A expenses and strategic orientation: Weiss' Methodology (Weiss 2010)

Variable	Strategy	n	Mean	St. Dev	Q1	Median	Q3	% Negative
STICKY	*DEFENDERS*[a]	3,212	0.065***	0.142	-0.042	0.013	0.12	41.5
STICKY	*PROSPECTORS*[b]	3,524	-0.039***	0.250	-0.155	-0.021	0.05	59.6

Notes:

This table reports the results of the calculation of the variable $STICKY_{i,t} = log\left(\frac{\Delta SG\&A}{\Delta SALE}\right)_{i,T(-)} - log\left(\frac{\Delta SG\&A}{\Delta SALE}\right)_{i,T(+)}$, $T(-), T(+) \in \{t, \dots, t-3\}$, where T(-) is the most recent quarter that the firm records a sales decrease, *T(+)* is the most recent quarter that the firms records a sales increase, *ΔSG&A* is the difference between the *SG&A* expenses in year t and those in the previous year; and *ΔSALE* is the difference between sales revenue in year t and that of the previous year.

*, **and *** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively.

[a] Denotes *DEFENDERS*: firms with a median value of its *STRATEGY* variable ranging from 6 to 12.

[b] Denotes *PROSPECTORS*: firms with a median value of its *STRATEGY* variable ranging from 24 to 30.

Table 6. Asymmetric cost behaviour of advertising expenses and strategic orientation

	Coefficient Estimates (t - stat)	
	DEFENDERS[a]	PROSPECTORS[b]
b_0 : constant	0.003**	0.009***
	(1.98)	(4.70)
b_1: log($Rev_{i,t}/Rev_{i,t-1}$)	0.182***	0.548***
	(8.91)	(66.80)
Two – Way Interaction Term		
b_2: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)	0.014***	-0.273***
	(2.85)	(-6.38)
Three – Way Interaction Terms		
b_3: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Emp_{i,t}/Rev_{i,t}$)	-0.019***	-0.041**
	(-3.31)	(-2.20)
b_4: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Assets_{i,t}/Rev_{i,t}$)	-0.076**	0.034***
	(-2.28)	(3.76)
b_5: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$ds_{i,t}$	-0.003**	-0.014*
	(-2.44)	(-1.71)
b_6: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*GNP_t	0.015***	0.036***
	(2.87)	(4.15)
b_7: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$FCF_{i,t}$	0.001	-0.003**
	(0.09)	(-2.44)
Main Terms		
b_8: log($Emp_{i,t}/Rev_{i,t}$)	0.122***	0.003***
	(7.31)	(2.67)
b_9: log($Assets_{i,t}/Rev_{i,t}$)	0.024***	0.007***
	(5.54)	(4.33)
b_{10}: $ds_{i,t}$	-0.061***	-0.014***
	(-10.14)	(-10.86)
b_{11}: GNP_t	0.009***	0.001***
	(7.46)	(2.59)
b_{12}: $FCF_{i,t}$	0.007	0.003***
	(1.41)	(2.67)
Number of Observations:	956	1,024
Adj. R-Squared:	0.274	0.335

Notes:

This table presents the results of the regression analysis of the estimated model $log\left(Advert_{i,t}^{j}/Advert_{i,t-1}^{j}\right) = b_0 + c_0^x X_{i,t}^{j} + (b_1 + c_1^x X_{i,t}^{j}) log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + (b_2 + c_2^x X_{i,t}^{j}) d_{i,t}^{j} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + \varepsilon_{i,t}$. Following Petersen's (2009) methodology, the model is estimated by using firm-clustered standard errors to control for autocorrelation and heteroscedasticity.

*, **and *** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively.

[a] Denotes *DEFENDERS*: firms with a median value of its *STRATEGY* variable ranging from 6 to 12.

[b] Denotes *PROSPECTORS*: firms with a median value of its *STRATEGY* variable ranging from 24 to 30.

$Advert_{i,t}^{j}$ = The annual advertising expenses of firm i operating in j industry in year t.

$X_{i,t}^{j}$ = A vendor of observable determinants of cost asymmetry including the following variables:

$Rev_{i,t}^{j}$ = Sales revenues of firm i operating in j industry in year t.

$d_{i,t}^{j}$ = A dummy variable which equals 1 if sales of firm i decreased in year t and 0 otherwise.

$Emp_{i,t}^{j}$ = Number of employees of firm i operating in j industry in year t.

$Assets_{i,t}^{j}$ = Total assets of firm i in j industry in year t.

$d_{si,t}^{j}$ = A dummy variable that takes the value of 1 if firm's sales revenue decreases for two consecutive periods, and 0 otherwise.

$FCF_{i,t}^{j}$ = Free cash flows of firm i operating in j industry in year t.

$GNP_{i,t}^{j}$ = The percentage growth in real Gross National Product during year t.

Table 7. Asymmetric cost behaviour of advertising expenses and strategic orientation (STRATEGY variable included)

	Coefficient Estimates (t - stat)
b_0 : constant	0.007***
	(4.33)
b_1: log($Rev_{i,t}/Rev_{i,t-1}$)	0.455***
	(17.99)
Two – Way Interaction Term	
b_2: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)	-0.283***
	(-10.59)
Three – Way Interaction Terms	
b_3: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Emp_{i,t}/Rev_{i,t}$)	0.054***
	(5.93)
b_4: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Assets_{i,t}/Rev_{i,t}$)	0.034***
	(3.76)
b_5: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$ds_{i,t}$	-0.018*
	(-1.66)
b_6: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*GNP_t	0.035***
	(4.17)
b_7: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$FCF_{i,t}$	-0.015***
	(-8.95)
b_8: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$STRATEGY_{i,t}$	-0.122***
	(-11.49)
Main Terms	
b_9: log($Emp_{i,t}/Rev_{i,t}$)	0.017**
	(-2.47)
b_{10}: log($Assets_{i,t}/Rev_{i,t}$)	0.067**
	(-2.49)
b_{11}: $ds_{i,t}$	-0.015***
	(-8.95)
b_{12}: GNP_t	0.001*
	(1.85)
b_{13}: $FCF_{i,t}$	0.004*
	(1.70)
b_{14}: $STRATEGY_{i,t}$	0.017**
	(2.72)
Number of Observations:	6,493
Adj. R-Squared:	0.614

Notes:

This table presents the results of the regression analysis of the estimated model $log\left(Advert_{i,t}^{j}/Advert_{i,t-1}^{j}\right) = b_0 + c_0^x X_{i,t}^{j} + (b_1 + c_1^x X_{i,t}^{j}) log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + (b_2 + c_2^x X_{i,t}^{j}) d_{i,t}^{j} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + \varepsilon_{i,t}$. Following Petersen's (2009) methodology, the model is estimated by using firm-clustered standard errors to control for autocorrelation and heteroscedasticity.

*, **and *** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively.

$Advert_{i,t}^{j}$ = The annual advertising expenses of firm i operating in j industry in year t.

$X_{i,t}^{j}$ = A vendor of observable determinants of cost asymmetry including the following variables:

$Rev_{i,t}^{j}$ = Sales revenues of firm i operating in j industry in year t.

$d_{i,t}^{j}$ = A dummy variable which equals 1 if sales of firm i in j industry in year t decreased in year t and 0 otherwise.

$Emp_{i,t}^{j}$ = Number of employees of firm i operating in j industry in year t.

$Assets_{i,t}^{j}$ = Total assets of firm i operating in j industry in year t.

$d_{si,t}^{j}$ = A dummy variable that takes the value of 1 if firm's sales revenue decreases for two consecutive periods, and 0 otherwise.

$FCF_{i,t}^{j}$ = Free cash flows of firm i operating in j industry in year t.

$STRATEGY_{i,t}$ = A variable ranging from 6 to 30 and it is used to denote a firm's strategic profile.

$GNP_{i,t}^{j}$ = The percentage growth in real Gross National Product during year t.

Table 8. Bayesian Analysis

	Full sample			Prospectors subsample			Defenders subsample		
	log(ML)	P(M)	P(M|y)	log(ML)	P(M)	P(M|y)	log(ML)	P(M)	P(M|y)
Simple model	-212.32	0.25	0.10	-198.57	0.25	0.11	-235.26	0.25	0.07
Extended model 1	-174.24	0.25	0.21	-198.15	0.25	0.18	-203.28	0.25	0.16
Extended model 2	-173.20	0.25	0.23	-197.85	0.25	0.29	-197.19	0.25	0.21
Full model	-170.24	0.25	0.44	-172.14	0.25	0.42	-194.32	0.25	0,56

Notes:

This table reports the results of Bayesian model comparison for the full sample of our study and the two subsamples of firms classified as prospectors or as defenders according to the STRATEGY variable. The specified models are the following:

Simple model: $log\left(\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}}\right) = b_0 + b_1 log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + b_2 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + \varepsilon_{i,t}$

Extended model 1:

$$log\left(\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}}\right) = b_0 + b_1 log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + b_2 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + b_3 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) log\left(\frac{Emp_{i,t}}{Rev_{i,t}}\right) + \varepsilon_{i,t}$$

Extended model 2:

$$log\left(\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}}\right) = b_0 + b_1 log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + b_2 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) +$$
$$b_3 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) log\left(\frac{Emp_{i,t}}{Rev_{i,t}}\right) + b_4 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) log\left(\frac{Assets_{i,t}}{Rev_{i,t}}\right) + \varepsilon_{i,t}$$

Full model:

$$log\left(\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}}\right) = b_0 + b_1 log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + b_2 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) +$$
$$b_3 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) log\left(\frac{Emp_{i,t}}{Rev_{i,t}}\right) + b_4 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) log\left(\frac{Assets_{i,t}}{Rev_{i,t}}\right) + b_5 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) ds +$$
$$b_6 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) GNP + b_7 d_{i,t} log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) FCF + b_8 log\left(\frac{Emp_{i,t}}{Rev_{i,t}}\right) + b_9 log\left(\frac{Assets_{i,t}}{Rev_{i,t}}\right) + b_{10} ds + b_{11} GNP +$$
$$b_{11} FCF + \varepsilon_{i,t}$$

Variable Definitions:

$SG\&A_{i,t}^{j}$ = The annual SG&A expenses of firm i operating in j industry in year t.

$Rev_{i,t}^{j}$ = Sales Revenues of firm i operating in j industry in year t.

$d_{i,t}^{j}$ = A dummy variable which equals 1 if sales of firm i in j industry in year t decreased in year t and 0 otherwise.

$Emp_{i,t}^{j}$ = Number of employees of firm i operating in j industry in year t.

$Assets_{i,t}^{j}$ = Total assets of firm i operating in j industry in year t.

$ds_{i,t}^{j}$ = A dummy variable that takes the value of 1 if firm's sales revenue decreases for two consecutive periods, and 0 otherwise.

$FCF_{i,t}^{j}$ = Free cash flows of firm i operating in j industry in year t.

$GNP_{i,t}^{j}$ = The percentage growth in real Gross National Product during year t.

Table 9. Strategy, organization capital intensity, managerial ability and SG&A asymmetric cost behaviour

Panel A: Strategy and organization capital intensity

$STRATEGY_{i,t}$	Low *ORGANIZATION CAPITAL* Intensity	High *ORGANIZATION CAPITAL* Intensity
Mean	9.34	25.42
Median	9.12	25.05

Panel B: Panel vector autoregressive models

	Dependent Variables					
Independent Variables	Model 1 $STICKY_{i,t}$	Model 2 $STICKY_{i,t}$	Model 3 $STRATEGY_{i,t}$	Model 4 $STRATEGY_{i,t}$	Model 5 $MA-Score^{j}_{i,t}$	Model 6 $ORGANIZATIONAL\ CAPITAL^{j}_{i,t}$
$STICKY_{i,\,t-1}$	0.035	0.044	0.025	0.040	0.017	0.007
	(0.88)	(0.88)	(1.57)	(0.36)	(0.23)	(0.93)
$STRATEGY_{i,\,t-1}$	0.203***	0.225***	0.010*	0.011*	0.041	0.015
	(9.42)	(2.63)	(2.40)	(1.63)	(0.49)	(1.44)
$ORGANIZATIONAL\ CAPITAL^{j}_{i,t-1}$	0.050*		0.016			0.036**
	(1.78)		(0.97)			(2.11)
$MA-Score^{j}_{i,t-1}$		0.040*		0.032	0.008*	
		(1.33)		(0.46)	(1.34)	
Number of Observations:	12.948	12.895	12.563	12.125	11.949	11.878

Panel C: Granger causality (Wald tests)

Model 1	Excluded	(Prob > F)	Model 2	Excluded	(Prob > F)
$STICKY_{i,t}$	$STRATEGY_{i,t}$	0.001	$STICKY_{i,t}$	$STRATEGY_{i,t}$	0.021
$STICKY_{i,t}$	$ORGANIZATIONAL\ CAPITAL^{j}_{i,t}$	0.089	$STICKY_{i,t}$	$MA-Score^{j}_{i,t}$	0.085
$STICKY_{i,t}$	All	0.007	$STICKY_{i,t}$	All	0.013
$STRATEGY_{i,t}$	$STICKY_{i,t}$	0.144	$STRATEGY_{i,t}$	$STICKY_{i,t}$	0.120
$STRATEGY_{i,t}$	$ORGANIZATIONAL\ CAPITAL^{j}_{i,t}$	0.257	$STRATEGY_{i,t}$	$MA-Score^{j}_{i,t}$	0.150
$STRATEGY_{i,t}$	All	0.156	$STRATEGY_{i,t}$	All	0.143
$ORGANIZATIONAL\ CAPITAL^{j}_{i,t}$	$STICKY_{i,t}$	0.205	$MA-Score^{j}_{i,t}$	$STICKY_{i,t}$	0.117
$ORGANIZATIONAL\ CAPITAL^{j}_{i,t}$	$STRATEGY_{i,t}$	0.296	$MA-Score^{j}_{i,t}$	$STRATEGY_{i,t}$	0.113
$ORGANIZATIONAL\ CAPITAL^{j}_{i,t}$	All	0.324	$MA-Score^{j}_{i,t}$	All	0.120

Notes:

$STRATEGY_{i,t}$ = the value of the STRATEGY variable of i firm in year t calculated using the methodology proposed by Bentley et al. (2013). For more details see Appendix A. The STRATEGY variable ranges from 6 to 30

$MA - Score^{j}_{i,t-1}$= the value of the MA-score of i firm operating in j industry in year t calculated using the methodology proposed proposed by Demerjian et al. (2012). For more details see Appendix C.

$ORGANIZATIONAL\ CAPITAL^{j}_{i,t}$= the median value of the economic value of the Organization Capital of i firm operating in j industry in year t calculated using the methodology proposed by Lev et al. (2009). For more details see Appendix B. Low (high) Organization Capital intensity corresponds to the lowest (highest) quantile of the ORGANIZATIONAL CAPITAL distribution.

*, **and *** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively.

Table 10. Asymmetric cost behaviour of SG&A expenses, strategic orientation & market concentration

	Coefficient Estimates (t - stat)	
	DEFENDERS[a]	*PROSPECTORS*[b]
b_0 : constant	0.010***	0.021***
	(3.19)	(6.75)
b_1: log($Rev_{i,t}/Rev_{i,t-1}$)	0.247***	0.649***
	(3.22)	(108.10)
Two – Way Interaction Term		
b_2: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)	0.086***	-0.325***
	(17.63)	(-2.75)
Three – Way Interaction Terms		
b_3: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Emp_{i,t}/Rev_{i,t}$)	-0.018*	-0.130***
	(-1.73)	(-3.62)
b_4: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Assets_{i,t}/Rev_{i,t}$)	-0.067***	0.034***
	(-4.77)	(3.76)
b_5: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$ds_{i,t}$	-0.011*	-0.014*
	(-1.74)	(-1.71)
b_6: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*GNP_t	0.018***	0.036***
	(3.24)	(4.15)
b_7: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$FCF_{i,t}$	0.001	-0.003**
	(0.09)	(-2.44)
b_8: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$MC_{i,t}$	-0.035***	-0.086***
	(-4.15)	(-3.99)
Main Terms		
b_9: log($Emp_{i,t}/Rev_{i,t}$)	0.122***	0.003***
	(7.31)	(2.67)
b_{10}: log($Assets_{i,t}/Rev_{i,t}$)	0.024***	0.007***
	(5.54)	(-4.33)
b_{11}: $ds_{i,t}$	-0.061***	-0.016***
	(-10.14)	(-1.97)
b_{12}: GNP_t	0.009***	0.001***
	(7.46)	(-2.59)
b_{13}: $FCF_{i,t}$	0.007	0.003***
	(1.41)	(2.67)
b_{14}: $MC_{i,t}$	0.024***	0.052***
	(4.19)	(2.60)
Number of Observations:	1,979	2,014
Adj. R-Squared:	0.201	0.273

Notes:

This table presents the results of the regression analysis of the estimated model $log\left(SG\&A_{i,t}^{j}/SG\&A_{i,t-1}^{j}\right) = b_0 + c_0^x X_{i,t}^j + (b_1 + c_1^x X_{i,t}^j) log\left(Rev_{i,t}^j/Rev_{i,t-1}^j\right) + (b_2 + c_2^x X_{i,t}^j) d_{i,t}^j log\left(Rev_{i,t}^j/Rev_{i,t-1}^j\right) + \varepsilon_{i,t}$. Following Petersen's (2009) methodology, the model is estimated by using firm-clustered standard errors to control for autocorrelation and heteroscedasticity.

*, **and *** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively.

[a] Denotes *DEFENDERS*: firms with a median value of its *STRATEGY* variable ranging from 6 to 12.

[b] Denotes *PROSPECTORS*: firms with a median value of its *STRATEGY* variable ranging from 24 to 30.

$SG\&A_{i,t}^{j}$ = The annual SG&A expenses of firm i operating in j industry in year t.

$X_{i,t}^{j}$ is a vendor of observable determinants of cost asymmetry including the following variables:

$Rev_{i,t}^{j}$ = Sales revenues of firm i operating in j industry in year t.

$d_{i,t}^{j}$ = A dummy variable which equals 1 if sales of firm i in j industry in year t decreased in year t and 0 otherwise.

$Emp_{i,t}^{j}$ = Number of employees of firm i operating in j industry in year t.

$Assets_{i,t}^{j}$ = Total assets of firm i operating in j industry in year t.

$d_{si,t}^{j}$ = A dummy variable that takes the value of 1 if firm's sales revenue decreases for two consecutive periods, and 0 otherwise.

$FCF_{i,t}^{j}$ = Free cash flows of firm i operating in j industry in year t.

$GNP_{i,t}^{j}$= The percentage growth in real Gross National Product during year t.

$MC_{i,t}^{j}$= Market concentration of firm i, increase in MC indicates decrease in competition. Market concentration is measured calculating the Herfindahl–Hirschman Index of the firms in the data sample at a 3-digic SIC classification.

Table 11. Asymmetric cost behaviour of SG&A expenses and market concentration

	Coefficient Estimates (t - stat)	
	Low Market Concentration[a]	High Market Concentration[b]
b_0 : constant	0.003*	0.012
	(1.89)	(1.40)
b_1: log($Rev_{i,t}/Rev_{i,t-1}$)	0.308***	0.600***
	(6.04)	(90.73)
Two – Way Interaction Term		
b_2: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)	-0.082***	-0.199***
	(-12.81)	(-7.74)
Three – Way Interaction Terms		
b_3: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Emp_{i,t}/Rev_{i,t}$)	-0.057***	-0.035***
	(-3.01)	(-2.82)
b_4: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Assets_{i,t}/Rev_{i,t}$)	-0.026***	-0.003**
	(-6.88)	(-2.44)
b_5: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$ds_{i,t}$	-0.011*	-0.014*
	(-1.74)	(-1.71)
b_6: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*GNP_t	0.052***	0.011***
	(12.71)	(11.55)
b_7: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$FCF_{i,t}$	0.001	-0.003**
	(0.09)	(-2.44)
b_8: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$STRATEGY_{i,t}$	-0.014***	-0.146***
	(-10.86)	(-4.75)
Main Terms		
b_9: log($Emp_{i,t}/Rev_{i,t}$)	0.122***	-0.003
	(7.31)	(-0.48)
b_{10}: log($Assets_{i,t}/Rev_{i,t}$)	0.024***	0.007***
	(5.54)	(-4.33)
b_{11}: $ds_{i,t}$	-0.019***	-0.070**
	(-3.31)	(-2.28)
b_{12}: GNP_t	0.009***	0.001***
	(7.46)	(-2.59)
b_{13}: $FCF_{i,t}$	-0.011*	0.003***
	(-1.86)	(2.67)
b_{14}: $STRATEGY_{i,t}$	0.004*	0.052***
	(1.71)	(2.60)
Number of Observations:	1,211	1,348
Adj. R-Squared:	0.284	0.218

Notes:

This table presents the results of the regression analysis of the estimated model $log\left(SG\&A_{i,t}^{j}/SG\&A_{i,t-1}^{j}\right) = b_0 + c_0^x X_{i,t}^{j} + (b_1 + c_1^x X_{i,t}^{j}) log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + (b_2 + c_2^x X_{i,t}^{j}) d_{i,t}^{j} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + \varepsilon_{i,t}$. Following Petersen's (2009) methodology, the model is estimated by using firm-clustered standard errors to control for autocorrelation and heteroscedasticity.

*, **and *** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively.

[a]Denotes the lowest quintile of the distribution of the median values of the market concentration of the firms in the data sample. Market concentration is measured calculating the Herfindahl–Hirschman Index of the firms in the data sample at a 3-digic SIC classification.

[b]Denotes the highest quintile of the distribution of the median values of the market concentration of the firms in the data sample. Market concentration is measured calculating the Herfindahl–Hirschman Index of the firms in the data sample at a 3-digic SIC classification.

$SG\&A_{i,t}^{j}$ = The annual SG&A expenses of firm i operating in j industry in year t.

$X_{i,t}^{j}$ is a vendor of observable determinants of cost asymmetry including the following variables:

$Rev_{i,t}^{j}$ = Sales revenues of firm i operating in j industry in year t.

$d_{i,t}^{j}$ = A dummy variable which equals 1 if sales of firm i in j industry in year t decreased in year t and 0 otherwise.

$Emp_{i,t}^{j}$ = Number of employees of firm i operating in j industry in year t.

$Assets_{i,t}^{j}$ = Total assets of firm i operating in j industry in year t.

$d^{j}_{si,t}$ = A dummy variable that takes the value of 1 if firm's sales revenue decreases for two consecutive periods, and 0 otherwise.

$FCF^{j}_{i,t}$= Free cash flows of firm i operating in j industry in year t.

$GNP^{j}_{i,t}$= The percentage growth in real Gross National Product during year t.

Table 12. Asymmetric cost behaviour of SG&A expenses and strategic orientation and market concentration

	Coefficient Estimates (t - stat)
b_0 : constant	0.019***
	(6.64)
b_1: log($Rev_{i,t}/Rev_{i,t-1}$)	0.806***
	(40.31)
Two – Way Interaction Term	
b_2: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)	-0.303***
	(-7.26)
Three – Way Interaction Terms	
b_3: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Emp_{i,t}/Rev_{i,t}$)	0.054***
	(-5.93)
b_4: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*log($Assets_{i,t}/Rev_{i,t}$)	0.037***
	(6.40)
b_5: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$ds_{i,t}$	-0.018*
	(-1.66)
b_6: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*GNP_t	0.035***
	(4.17)
b_7: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$FCF_{i,t}$	-0.013***
	(-11.68)
b_8: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$STRATEGY_{i,t}$	-0.194***
	(-5.37)
b_9: $d_{i,t}$ *log($Rev_{i,t}/Rev_{i,t-1}$)*$MC_{i,t}$	-0.075**
	(-2.28)
Main Terms	
b_{10}: log($Emp_{i,t}/Rev_{i,t}$)	0.003***
	(2.67)
b_{11}: log($Assets_{i,t}/Rev_{i,t}$)	0.007***
	(-4.33)
b_{12}: $ds_{i,t}$	-0.015***
	(-8.95)
b_{13}: GNP_t	0.001*
	(1.85)
b_{14}: $FCF_{i,t}$	0.003***
	(2.67)
b_{15}: $STRATEGY_{i,t}$	-0.056***
	(-7.63)
b_{16}: $MC_{i,t}$	0.041**
	(2.56)
Number of Observations:	6,186
Adj. R-Squared:	0.597

Notes:

This table presents the results of the regression analysis of the estimated model $log\left(SG\&A_{i,t}^{j}/SG\&A_{i,t-1}^{j}\right) = b_0 + c_0^x X_{i,t}^{j} + (b_1 + c_1^x X_{i,t}^{j}) log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + (b_2 + c_2^x X_{i,t}^{j}) d_{i,t}^{j} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + \varepsilon_{i,t}$. Following Petersen's (2009) methodology, the model is estimated by using firm-clustered standard errors to control for autocorrelation and heteroscedasticity.

*, **and *** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively.

$SG\&A_{i,t}^{j}$ = The annual SG&A expenses of firm i operating in j industry in year t.

$X_{i,t}^{j}$ is a vendor of observable determinants of cost asymmetry including the following variables:

$Rev_{i,t}^{j}$ = Sales revenues of firm i operating in j industry in year t.

$d_{i,t}^{j}$ = A dummy variable which equals 1 if sales of firm i in j industry in year t decreased in year t and 0 otherwise.

$Emp_{i,t}^{j}$ = Number of employees of firm i operating in j industry in year t.

$Assets_{i,t}^{j}$ = Total assets of firm i operating in j industry in year t.

$d_{si,t}^{j}$ = A dummy variable that takes the value of 1 if firm's sales revenue decreases for two consecutive periods, and 0 otherwise.

$FCF_{i,t}^{j}$ = Free cash flows of firm i operating in j industry in year t.

$GNP_{i,t}^{j}$ = The percentage growth in real Gross National Product during year t.

$MC_{i,t}^{j}$ = Market concentration of firm i, increase in MC indicates decrease in competition. Market concentration is measured calculating the Herfindahl–Hirschman Index of the firms in the data sample at a 3-digic SIC classification.

Table 13. SG&A Cost Stickiness and Strategy under Optimistic and Pessimistic Scenario

	Coefficient Estimates (t - stat)
b_0 : constant	0.016***
	(6.66)
b_1^{OPT}: I_{t-1} * log($Rev_{i,t}/Rev_{i,t-1}$)	0.491***
	(4.85)
b_2^{OPT}: I_{t-1} * $d_{i,t}$ * log($Rev_{i,t}/Rev_{i,t-1}$)	-0.186***
	(-7.57)
b_3^{OPT}: I_{t-1}*$d_{i,t}$*log($Rev_{i,t}/Rev_{i,t-1}$) * $STRATEGY_{i,t}$	-0.146***
	(-4.75)
b_1^{PES}: $d_{i,t-1}$ * log($Rev_{i,t}/Rev_{i,t-1}$)	0.284***
	(3.53)
b_2^{PES}: $d_{i,t-1}$ * $d_{i,t}$ * log($Rev_{i,t}/Rev_{i,t-1}$)	0.066**
	(2.27)
b_3^{PES}: $d_{i,t-1}$*$d_{i,t}$*log($Rev_{i,t}/Rev_{i,t-1}$)* $STRATEGY_{i,t}$	-0.034***
	(-2.97)
Number of Observations:	8.594
Adj. R-Squared:	0.296

Notes:

This table presents the results of the regression analysis of the estimated model $log\left(SGA_{i,t}^{j}/SGA_{i,t-1}^{j}\right) = b_0 + b_1^{OPT} I_{t-1}\ log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_2^{OPT} I_{t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_3^{OPT} I_{t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) STRATEGY_{i,t} + b_1^{PES}\, d_{i,t-1} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_2^{PES} d_{i,t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_3^{PES} d_{i,t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) STRATEGY_{i,t} + \varepsilon_{i,t}$

Following Petersen's (2009) methodology, the model is estimated by using firm-clustered standard errors to control for autocorrelation and heteroscedasticity.

*, **and *** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively.

[a] Denotes *DEFENDERS*: firms with a median value of its *STRATEGY* variable ranging from 6 to 12.

[b] Denotes *PROSPECTORS*: firms with a median value of its *STRATEGY* variable ranging from 24 to 30.

Variable Definitions:

$SG\&A_{i,t}$ = The annual SG&A expenses of firm i in year t.

$Rev_{i,t}$ = Sales Revenues of firm i in year t.

$I_{i,t}$ = A dummy variable which equals 1 if sales of firm i increased in year t and 0 otherwise.

$I_{i,t-1}$ = A dummy variable which equals 1 if sales of firm i increased in year t-1 and 0 otherwise.

$d_{i,t}$ = A dummy variable which equals 1 if sales of firm i decreased in year t and 0 otherwise.

$d_{i,t-1}$ = A dummy variable which equals 1 if sales of firm i decreased in year t-1 and 0 otherwise.

$STRATEGY_{i,t}$ = A variable ranging from 6 to 30 and it is used to denote a firm's strategic profile.

Table 14. SG&A Cost Stickiness, Strategy and Market Concentration under Low and High Market Concentration

	Coefficient Estimates (*t* - stat)	
	Low Market Concentration[a]	High Market Concentration[b]
b_0 : constant	0.014**	0.034***
	(2.49)	(10.97)
b_1^{OPT}: I_{t-1} * log($Rev_{i,t}/Rev_{i,t-1}$)	0.252***	0.515***
	(65.54)	(200.8)
b_2^{OPT}: I_{t-1} * $d_{i,t}$ * log($Rev_{i,t}/Rev_{i,t-1}$)	-0.016***	-0.306**
	(-8.33)	(-2.29)
b_3^{OPT}: I_{t-1}*$d_{i,t}$*log($Rev_{i,t}/Rev_{i,t-1}$) * $STRATEGY_{i,t}$	-0.011**	-0.122***
	(-2.55)	(-11.49)
b_1^{PES}: $d_{i,t-1}$ * log($Rev_{i,t}/Rev_{i,t-1}$)	0.196***	0.209***
	(8.83)	(7.73)
b_2^{PES}: $d_{i,t-1}$ * $d_{i,t}$ * log($Rev_{i,t}/Rev_{i,t-1}$)	0.031***	-0.024***
	(4.02)	(-6.20)
b_3^{PES}: $d_{i,t-1}$*$d_{i,t}$*log($Rev_{i,t}/Rev_{i,t-1}$)* $STRATEGY_{i,t}$	-0.011*	-0.022***
	(-1.86)	(-7.13)
Number of Observations:	1,692	1,714
Adj. R-Squared:	0.520	0.547

Notes:

This table presents the results of the regression analysis of the estimated model $log\left(SGA_{i,t}^{j}/SGA_{i,t-1}^{j}\right) = b_0 + b_1^{OPT} I_{t-1}\ log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_2^{OPT} I_{t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_3^{OPT} I_{t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) STRATEGY_{i,t} + b_1^{PES}\, d_{i,t-1} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_2^{PES} d_{i,t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_3^{PES} d_{i,t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) STRATEGY_{i,t} + \varepsilon_{i,t}$

Following Petersen's (2009) methodology, the model is estimated by using firm-clustered standard errors to control for autocorrelation and heteroscedasticity.

*, ** and *** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively.

[a]Denotes the lowest quintile of the distribution of the median values of the economic value of market concentration of the firms in the data sample. Market concentration is measured calculating the Herfindahl–Hirschman Index of the firms in the data sample at a 3-digic SIC classification.

[b]Denotes the highest quintile of the distribution of the median values of the economic value of market concentration of the firms in the data sample. Market concentration is measured calculating the Herfindahl–Hirschman Index of the firms in the data sample at a 3-digic SIC classification.

Variable Definitions:

$SG\&A_{i,t}$ = The annual SG&A expenses of firm i in year t.

$Rev_{i,t}$ = Sales Revenues of firm i in year t.

$I_{i,t}$ = A dummy variable which equals 1 if sales of firm i increased in year t and 0 otherwise.

$I_{i,t-1}$ = A dummy variable which equals 1 if sales of firm i increased in year t-1 and 0 otherwise.

$d_{i,t}$ = A dummy variable which equals 1 if sales of firm i decreased in year t and 0 otherwise.

$d_{i,t-1}$ = A dummy variable which equals 1 if sales of firm i decreased in year t-1 and 0 otherwise.

$STRATEGY_{i,t}$ = A variable ranging from 6 to 30 and it is used to denote a firm's strategic profile.

Table 15. SG&A Cost Stickiness and Strategy under Optimistic and Pessimistic Scenario (defenders versus prospectors)

	Coefficient Estimates (t - stat)	
	DEFENDERS[a]	PROSPECTORS[b]
b_0 : constant	0.011***	0.015***
	(8.12)	(2.63)
b_1^{OPT}: I_{t-1} * log($Rev_{i,t}/Rev_{i,t-1}$)	0.420***	0.547***
	(9.10)	(15.55)
b_2^{OPT}: I_{t-1} * $d_{i,t}$ * log($Rev_{i,t}/Rev_{i,t-1}$)	0.037***	-0.253***
	(6.40)	(-6.49)
b_1^{PES}: $d_{i,t-1}$ * log($Rev_{i,t}/Rev_{i,t-1}$)	0.226***	0.308***
	(8.86)	(6.04)
b_2^{PES}: $d_{i,t-1}$ * $d_{i,t}$ * log($Rev_{i,t}/Rev_{i,t-1}$)	0.076***	-0.036***
	(5.04)	(-7.38)
Number of Observations:	2,650	2,947
Adj. R-Squared:	0.180	0.227

Notes:

This table presents the results of the regression analysis of the estimated model $log\left(SGA_{i,t}^{j}/SGA_{i,t-1}^{j}\right) = b_0 + b_1^{OPT} I_{t-1}\ log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_2^{OPT} I_{t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_1^{PES}\, d_{i,t-1} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + b_2^{PES} d_{i,t-1}\, d_{i,t} log\left(Rev_{i,t}^{j}/Rev_{i,t-1}^{j}\right) + \varepsilon_{i,t}$. Following Petersen's (2009) methodology, the model is estimated by using firm-clustered standard errors to control for autocorrelation and heteroscedasticity.

*, ** and *** represent significance levels of 10 percent, 5 percent, and 1 percent, respectively.

[a] Denotes *DEFENDERS*: firms with a median value of its *STRATEGY* variable ranging from 6 to 12.

[b] Denotes *PROSPECTORS*: firms with a median value of its *STRATEGY* variable ranging from 24 to 30.

Variable Definitions:

$SG\&A_{i,t}$ = The annual SG&A expenses of firm i in year t.

$Rev_{i,t}$ = Sales Revenues of firm i in year t.

$I_{i,t}$ = A dummy variable which equals 1 if sales of firm i increased in year t and 0 otherwise.

$I_{i,t-1}$ = A dummy variable which equals 1 if sales of firm i increased in year t-1 and 0 otherwise.

$d_{i,t}$ = A dummy variable which equals 1 if sales of firm i decreased in year t and 0 otherwise.

$d_{i,t-1}$ = A dummy variable which equals 1 if sales of firm i decreased in year t-1 and 0 otherwise.