

CEO Overconfidence and Cost Stickiness

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ABSTRACT

Cost stickiness occurs when costs decrease less when sales fall than they increase when sales rise. Prior literature provides both economic and agency explanations of sticky costs. Our study tackles this cost behaviour from a managerial behavioural perspective. We predict and find that cost stickiness is greater when firms are managed by overconfident CEOs. The results are consistent with the notion that overconfident CEOs are more likely to exhibit an optimistic bias and tend to be overly positive about their capability of restoring sales in case of declining sales. As a result, they retain excessive selling, general and administrative resources when sales drop, leading to greater cost stickiness.

INTRODUCTION

Understanding cost behaviour is an essential task for a top management team and it is also a fundamental element of cost accounting. Management accounting techniques conventionally assume that costs vary proportionally with sales. Deviating from this traditional assumption of symmetric cost behaviour, numerous recent studies show that costs are sticky, that is, they decrease less when sales fall than they increase when sales rise (Balakrishnan, et al., 2004). For example, Anderson et al. (2003) show that selling, general and administrative (SG&A) costs increase by 0.55% per 1% increase in sales, but decrease by only 0.35% per 1% decline in sales. This phenomenon is known as asymmetrical cost behaviour, which is referred to in the literature as ‘cost stickiness’.

The classic example of cost stickiness relates to SG&A costs, such as salaries, advertising and administrative expenses. According to the literature, top managers have a large degree of discretion regarding SG&A costs. Evidence shows that cost stickiness has a negative effect on a firm’s current earnings because the drop in sales is not compensated for by a commensurate drop in costs. This study examines the relationship between cost stickiness and CEO overconfidence. What happens when a CEO overestimates the accuracy of his or her assessment of future demand? Our study is built on the assumption that an overconfident CEO is overly positive about his or her impact on restoring sales; we expect overconfident CEOs to maintain excessive SG&A resources in case of declining sales, and in turn result in greater cost stickiness.

Following prior literature, we use the prominence of the CEO’s photograph in the annual report to measure CEO overconfidence (see, e.g., Chatterjee & Hambrick 2007; Schrand & Zechman, 2012). Our examination of 1,628 firm-year observations for the fiscal years 2002-2009 reveals that cost stickiness indeed increases with CEO overconfidence.

Our study makes the following contributions. First, we contribute to the cost stickiness literature by providing a behavioural explanation of cost stickiness, namely CEO overconfidence. Second, this study will assist professionals in gaining more knowledge of firms' cost behaviour. Our results shed light on the undesired effects of CEO overconfidence on cost stickiness that negatively affects a firm's current earnings.

More specifically, our study has profound implications for practitioners. First, a firm's selection/nomination committee should take into account the effects of CEO confidence on corporate cost behaviour when they appoint a new CEO. Understanding the relationship between CEO personality traits and corporate decision making may help the committee/board select candidates who best match the business strategies. Relatedly, a firm's remuneration committee should incorporate the cost behaviour effects of CEO overconfidence into the design of top management remuneration packages. For example, increasing the proportion of performance-based pay might mitigate such cost behaviour of overconfident CEOs. Equally important, our results suggest that auditors should consider CEO overconfidence as a red flag when planning their review tasks.

THEORY AND HYPOTHESIS DEVELOPMENT

Cost stickiness

Traditional managerial accounting literature assumes that costs can be categorized into fixed and variable costs, where the latter are proportional to the volume change. In other words, the relation between variable costs and volume is symmetric for both volume increase and decrease. Anderson et al. (2003) provide the first evidence, based upon a large sample, that SG&A costs behave asymmetrically, contrary to the traditional assumption; in particular they show that

SG&A costs increase by 0.55% per 1% increase in sales while they decrease by only 0.35% per 1% decline in sales. Subramaniam and Weidenmier (2003) find that total costs increase by 0.93% per 1% increase in revenues, but decrease by 0.85% per 1% decrease in revenues. Calleja et al. (2006) show that when sales revenue increases by 1%, SG&A costs go up by 0.97%, and when sales revenue declines by 1%, SG&A costs go down by only 0.91%.

Prior literature mainly provides two explanations of cost stickiness. The first stream focuses on the impact of *economic factors* on the degree of cost stickiness. The decision to cut or keep SG&A resources depends on the trade-off between managers' expectations about the persistence of the decline in demand and the magnitude of the adjustment costs associated with cutting SG&A resources in the short term and replacing such resources when demand is restored. Managers are more likely to keep excessive resources if they expect demand to be restored soon. If the fall in demand is perceived as temporary, one can expect higher cost stickiness, since the cost of adjustment might be higher than the costs of unused capacity. Managers will then decide to retain unutilized resources rather than incur adjustment costs, resulting in sticky costs (Anderson et al., 2003).

The second stream of studies focuses on the *agency problem*. Managers make self-maximizing decisions that might not be in the best interest of the shareholders. A classic example of such self-serving behaviour is 'empire building', whereby managers hold more resources under their control. Empire building contributes to the stickiness of costs because managers have incentives to avoid engaging in resource disposing activities.

CEO overconfidence

Overconfidence is a characteristic observed not only in the business world, but also in everyday life. Prior research shows that overconfident individuals assume they are better than

other individuals, even when this is not the case. Overconfidence is generally defined as having inaccurate, overly positive perceptions of one's abilities or knowledge, which is conceptualized in two ways in the psychology literature. There is the '*better-than-average*' effect, which is the tendency of individuals to think of themselves as 'above average' on positive characteristics, and *miscalibration*, whereby individuals overestimate the accuracy of their forecast (Chen et al., 2013).

In the finance and accounting literature, an overconfident manager is viewed as a manager who systematically overestimates future returns in case of favourable outcomes, and systematically underestimates the impact in case of adverse outcomes. A large number of studies document the influence of CEO overconfidence on corporate and accounting decisions. Doukas and Petmezas (2007) argue that overconfident CEOs feel that they have superior decision-making abilities. The presence of these cognitive biases encourages CEOs to emphasize their own judgment in decision making. Malmendier and Tate (2008) find that overconfident CEOs overpay for target companies and undertake value-destroying mergers. Evidence also shows that overconfident CEOs are more likely to exhibit an optimistic bias and thus are more likely to intentionally misstate earnings (Schrand and Zechman, 2012); such CEOs are more willing to issue management earnings forecasts (Libby and Rennekamp, 2012), but they use less conservative accounting (Ahmed and Duellman, 2012).

Hypothesis development

Drawing on the psychology literature on overconfidence, we hypothesize that CEO overconfidence increases the degree of cost stickiness. We argue that the two overconfidence mechanisms, namely better-than-average effect and miscalibration, affect managers' assessments of future demand. In case of a decline in sales, overconfident CEOs tend to be overly positive

about their capability for restoring sales. Hence, they are more likely to overestimate the likelihood of a sales rebound in the near future. As a result, they will retain excessive SG&A resources when sales decline, leading to greater cost stickiness. In addition, overconfident CEOs have a tendency to overestimate the accuracy of their assessments, which also increases the probability of retaining unutilized SG&A resources, again resulting in greater cost stickiness. Taken together, both behavioural mechanisms bias managers' expectations about the likelihood of a sales rebound. Thus, overconfident CEOs are more likely to retain excessive SG&A resources, bringing about greater SG&A cost stickiness. This yields the following hypothesis:

HYPOTHESIS: SG&A cost stickiness increases with CEO overconfidence.

RESEARCH DESIGN

Our sample consists of 257 UK listed firms (217 FTSE 350 and 40 SmallCap firms) and 1,628 firm-year observations. The data were retrieved from BoardEx, Compustat and Orbis. Our investigation covers the years 2002–2009. In order to minimize the effects of outliers, we winsorize the top and bottom 1% of the observations for all continuous variables.

Measurement of cost stickiness

We employ the original model developed by Anderson et al. (2003) to measure cost stickiness:

$$\Delta \ln SGA_{i,t} = \beta_0 + \beta_1 \Delta \ln Sales_{i,t} + \beta_2 DecrDum_{i,t} + \beta_3 \Delta \ln Sales_{i,t} * DecrDum_{i,t} + \epsilon_{i,t} \quad (1)$$

where i represents firm i and t for year t ; $\Delta \ln SGA_{i,t} = \ln(SGA_{i,t} / SGA_{i,t-1})$, $\Delta \ln Sales_{i,t} = \ln(Sales_{i,t} / Sales_{i,t-1})$; SGA is selling, general and administrative costs (#189 Compustat); Sales is net sales (#12 Compustat); DecrDum is an indicator equal to one if sales in t are lower than sales in $t-1$, and zero otherwise. Following Anderson et al. (2003), we rely on the log specification of

$SGA_{i,t} / SGA_{i,t-1}$ and $Sales_{i,t} / Sales_{i,t-1}$ to improve the comparability of sales across firms and to alleviate potential heteroskedasticity problems.

The coefficient β_1 measures the percentage increase in SG&A costs in case of a 1% increase in sales. Since $DecrDum$ equals 1 when revenue decreases, the sum of the coefficients ($\beta_1 + \beta_3$) measures the percentage decrease in SG&A costs in case of a 1% decrease in sales. A positive and significant coefficient β_1 and a significantly negative coefficient β_3 are consistent with cost stickiness, indicating a subdued cost reaction when sales decline (Chen et al., 2013).

Measurement of CEO overconfidence

Following prior literature, we measure CEO overconfidence by the prominence of a CEO's photograph in an annual report (OC). An overconfident CEO will try to make him- or herself stand out or more visible than other executives in the annual report as a strong declaration that he or she is more important, skilled and knowledgeable. CEOs with an individual photo should arguably be more overconfident than those with a collective photo. The greater the visibility of the CEO's photographs in the annual report, the more confident the CEO is about him- or herself. Following Schrand and Zechman (2012), we rate CEO overconfidence as follows:

Table 1 Prominence of CEO's photograph

Definition	OC score
At least half a page & no other individuals	4
Less than half a page & no other individuals	3
There are other individuals with the CEO	2
No CEO photo	1

Empirical model

To test whether CEO overconfidence relates to cost stickiness, we extend the original model of Anderson et al. (2003) as follows:

$$\begin{aligned} \Delta \ln \text{SGA}_{i,t} = & \beta_0 + \beta_1 \Delta \ln \text{Sales}_{i,t} + \beta_2 \text{DecrDum}_{i,t} + \beta_3 \Delta \ln \text{Sales}_{i,t} * \text{DecrDum}_{i,t} + \beta_4 \text{OC}_{i,t} + \\ & \beta_5 \Delta \ln \text{Sales}_{i,t} * \text{OC}_{i,t} + \beta_6 \text{DecrDum}_{i,t} * \text{OC}_{i,t} + \beta_7 \Delta \ln \text{Sales}_{i,t} * \text{DecrDum}_{i,t} * \text{OC}_{i,t} + \\ & \sum \beta_j \text{CONTROL}_{j,i,t} + \sum \beta_j \Delta \ln \text{Sales}_{i,t} * \text{CONTROL}_{j,i,t} + \sum \beta_j \text{DecrDum}_{i,t} * \text{CONTROL}_{j,i,t} + \\ & \sum \beta_j \Delta \ln \text{Sales}_{i,t} * \text{DecrDum}_{i,t} * \text{CONTROL}_{j,i,t} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

β_7 represents the three-way interaction effect ($\Delta \ln \text{Sales}_{i,t} * \text{DecrDum}_{i,t} * \text{OC}_{i,t}$); a negative and significant β_7 suggests that CEO overconfidence positively affects cost stickiness. Following Chen et al. (2013), we include a number of economic and agency control variables. Employee intensity (EMPLINT) is calculated as the number of employees (#29 Compustat) divided by sales. Asset intensity (ASSETINT) is calculated as total assets (#06 Compustat) divided by sales. Free cash flow (FCF) is calculated as cash flow from operating activities (#308 Compustat) in year t less capital expenditures (#128 Compustat) scaled by current assets (#4 Compustat).

EMPIRICAL RESULTS

Table 2 provides descriptive statistics. Our sample firms have a mean value of £2,730.93 million in annual sales revenue; the median is £863.60 million. On average, the SG&A costs for these firms are £455.15 million, with a median of £136.69 million.

Table 2 Descriptive statistics

	Mean	SD	10%	50%	90%
Sales (£ mln)	2,730.93	4,975.94	128.07	863.60	7,797.70
SGA costs (£ mln)	455.15	1051.59	17.97	136.69	795.60
Sales _{i,t} /Sales _{i,t-1}	1.48	4.10	0.64	1.08	1.47
SGA _{i,t} /SGA _{i,t-1}	9.16	167.57	0.58	1.06	1.83
SGA _{i,t} /Sales _{i,t} (%)	22.21	17.03	3.96	19.05	44.66

Table 3 summarizes the sample distribution by industry based on a classification by 2-digit SIC codes. The manufacturing (34.59%) and services (21.68%) sectors are the most heavily represented industries in our sample.

Table 3: Sample distribution by industry (N = 1628)

Industry	SIC	N	%
Agriculture-Forestry-Fishing-Hunting	00–09	3	0.18
Mining-Construction	10–19	224	13.76
Manufacturing	20–39	563	34.59
Transport	40–49	191	11.73
Wholesale-Retail trade	50–59	291	17.88
Finance-Insurance-Real estate	60–67	3	0.18
Services	70–89	353	21.68
Total		1,628	100

Our regression results in Table 4 show that the coefficient on our variable of interest (i.e., $\Delta \ln \text{Sales}_{i,t} * \text{DecrDum}_{i,t} * \text{OC}_{i,t}$) that calibrates the three-way interaction effect is negative (i.e., -0.34) and significant ($p < 0.01$), thereby indicating that firms with overconfident CEOs are associated with greater cost stickiness. Turning to the control variables, the coefficient on $\Delta \ln \text{Sales}_{i,t} * \text{DecrDum}_{i,t} * \text{FCF}_{i,t}$ is negative (-0.41) and significant ($p < 0.05$); this suggests that firms with severer agency problem exhibit greater asymmetrical cost behaviour, which is in line the ‘empire building’ explanation.

Table 4: Cost stickiness and CEO overconfidence

Independent variable	Dependent variable	
	$\Delta \ln \text{SGA}$ (1)	$\Delta \ln \text{SGA}$ (2)
$\Delta \ln \text{Sales}$	0.95*** (17.03)	0.71*** (7.89)
DecrDum	0.17*** (2.90)	0.04 (0.47)
$\Delta \ln \text{Sales} * \text{DecrDum}$	-0.19 *** (-2.78)	-0.10 (-0.92)
OC		-0.05 * (-1.88)
$\Delta \ln \text{Sales} * \text{OC}$		0.21*** (3.58)
DecrDum * OC		-0.03 (-0.65)

Independent variable	Dependent variable	
	$\Delta \ln \text{SGA}$ (1)	$\Delta \ln \text{SGA}$ (2)
$\Delta \ln \text{Sales} * \text{DecrDum} * \text{OC}$		-0.34*** (-4.42)
EMPLINT		0.20 (0.46)
$\Delta \ln \text{Sales} * \text{EMPLINT}$		-0.94 (-0.89)
$\text{DecrDum} * \text{EMPLINT}$		0.27 (0.18)
$\Delta \ln \text{Sales} * \text{DecrDum} * \text{EMPLINT}$		0.39 (0.34)
ASSETINT		0.21 (0.69)
$\Delta \ln \text{Sales} * \text{ASSETINT}$		0.14*** (2.91)
$\text{DecrDum} * \text{ASSETINT}$		0.08** (2.19)
$\Delta \ln \text{Sales} * \text{DecrDum} * \text{ASSETINT}$		-0.02 (-0.46)
FCF		-0.04 (-0.49)
$\Delta \ln \text{Sales} * \text{FCF}$		0.39** (2.15)
$\text{DecrDum} * \text{FCF}$		-0.41** (-2.18)
$\Delta \ln \text{Sales} * \text{DecrDum} * \text{FCF}$		-0.41** (-2.18)
N	1,628	1,628
R-squared	0.32	0.34
F-statistics	250.03***	43.01***

This table contains pooled OLS regressions of cross-sectional determinants of cost stickiness. The *t*-statistics are in parentheses. ***, **, * indicate significance at 1%, 5% and 10% levels (two-tailed), respectively.

CONCLUSIONS

We propose that CEO overconfidence provides a behavioural explanation of cost stickiness that is distinct from prior economic and agency explanations. After controlling for economic and agency factors, we find that firms with overconfident CEOs have greater cost stickiness. Hence, our results show that CEO overconfidence has incremental explanatory power. Although both

empire building and overconfident managers are likely to avoid cutting SG&A resources, they differ in that empire building CEOs keep excessive resources for opportunistic reasons, whereas overconfident CEOs retain unutilized resources because they believe they are able to restore sales when sales decline. By providing a novel determinant of cost stickiness at executive level, our results provide strong support for the role of managerial personality traits in corporate decision making.

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