IMPACTS OF COST STICKINESS ON PROFITABILITY: THE CASE OF LISTED COMPANIES IN VIETNAM

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Abstract

According to the traditional cost behavior, costs are categorized as fixed or variable costs. Variable costs change proportionately with changes in the activity driver. Nevertheless, empirical evidence shows that cost increase with activity increase is more rapid than cost decrease with activity decrease. This phenomenon is named as sticky cost.

In this paper, we measure the cost stickiness of each company and answer the research question that whether sticky costs affect the profitability of listed companies in Vietnam. We find that selling costs, general costs, and administration costs of listed companies in Vietnam are sticky in period 2011 – 2015, and the situation is more serious than the case of US and Brazil. Our analysis shows that the stickiness of selling and administration costs affects the earnings per share forecast. The paper suggests some recommendations for managers to avoid the negative effects of sticky cost on business performance.

Keywords: Sticky cost, selling and administration costs, cost behavior, firm profitability.

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1. Introduction

Cost management is one of the most important issues of firm performance and financial management. Cost management - the process of effectively planning and controlling the costs involved in a business - is considered as one of the more challenging tasks in business management. Effective cost management creates value for firms and leads to a firm's success.

The traditional cost behavior postulates that activity costs change proportionately with activity volume change and treats costs as fixed or variable, of which variable costs automatically change symmetrically with changes in the activity driver. Nevertheless, recent studies (Anderson et al., 2003; Weiss, 2010; Cannon, 2014; Roodzant, 2012, Via and Perego, 2013, Serdaneh, 2014) confirm an asymmetric response of costs to increase

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and decrease in activities. The authors label that as sticky cost, which is the phenomenon that cost increase with activity increase is more rapid than cost decrease wiz th activity decrease. In 2003, Anderson et al (2003) find an evidence for the first time that for 7,629 U.S. firms over 20 years, selling and administration costs (SGA) increase on average by 0.55% per one percent increase in sales but decrease by only 0.35% per one percent decrease in sales. After a decade, Roodzant (2012) finds, for 39,738 U.S. firms over 14 years, that U.S. firms exhibit significantly asymmetrical SGA cost behavior. SGA costs increase by 0.46% following a one percent increase in activity and decrease by 0.32% when there is a one percent decrease in activity.

Many subsequent studies have applied the model developed by Anderson et al. (2003) to test the cost stickiness of firms in OECD countries (Banker and Chen, 2006), in the UK, French and German (Calleja and Thomas, 2006), in Japan (He and Shimizu, 2010), in Korea (Rhee et al., 2012), in Thailand (Warganegara and Tamara, 2014), in Jordan (Abu-Serdaneh, 2014), and in Iran (Fasarani et al., 2015). However, it is not expected that all costs to be sticky in all circumstances. On the contrary, based on the economic foundations of cost stickiness, the degree of cost stickiness could vary systematically across different cost accounts, firms, industries and countries (Anderson et al., 2003).

Recent researchers also find the impact of sticky cost on firm performance. A firm with sticky costs shows a greater decline in earnings when activity level falls than others. Sticky costs result in a smaller cost adjustment when activity level declines and, therefore, lower cost savings. Lower cost savings result in greater decrease in earnings. Weiss (2010) also states that cost stickiness influences the magnitude of analyst's earning forecast errors, particularly when market condition takes a turn for the worse. Sticky cost behavior would influence analysts' coverage priorities if they recognize the relationship between cost stickiness and accuracy of earning forecast. Applying the model from Weiss (2010), Warganegara and Tamara (2014) tests the impact of sticky costs on the future performance of business in Indonesia and finds that the cost stickiness threatened the earnings per share of companies. Banker et al. (2011) suggest that managers should adjust sticky costs before revenue reduction, however in the case of revenue increase, sticky costs are useful.

To find out reasons causing sticky costs, Anderson et al. (2003) argue that firms experience these sticky costs because managers increase resources when sales rise but make a deliberate decision to maintain slack resources when there is uncertainty about future demand and they expect the drop in sales to be temporary. In this way, they seek to minimize both current and future adjustment costs (e.g., disposal costs of existing equipment and installation costs of new equipment when demand bounces back). Managers may purposely delay reductions to committed resources until they are more certain about the permanence of a decline in demand. Another justification for sticky cost behavior is based on managerial empire building and the manager's tendencies to grow the firm beyond its optimal size or to maintain unutilized recourses with the purpose of increasing utility from status, power, and prestige (Medeiros et al., 2004). Another

important drive of sticky costs is managers' incentives when their compensation is linked to profit or stock prices that are related to reported profit. Agency issues may diminish or reinforce cost stickiness (Weiss, 2010). Other factors of sticky cost behavior are associated with firm specific characteristics such as asset intensity, employee intensity and debt intensity (Anderson et al., 2003; Banker and Chen, 2006; and Via and Perego, 2013).

Recently, due to the increasing of competition, SGA play significant roles in listed companies in Vietnam as they are increasing and much higher than other costs. To investigate sticky cost behavior in SGA in the listed companies, the first part of the paper compares the variation of SGA accompanying sales revenue increase with the variation of SGA with sales revenue decrease. The paper also analyzes the variation in degree of sticky costs to see whether the stickiness of SGA changes with the aggregation of periods and less pronounced when revenue declines in the preceding period. The second part of the paper is to measure the stickiness of each company and tests whether the phenomenon of sticky costs affects the profitability of those companies. The result shows that the stickiness of SGA affects the earnings per share. Hence, to maintain the profitability a firm manager should take into account the cost asymmetry to avoid the negative impact on the firm stability.

2. Hypothesis developmentA

By labeling the definition of sticky costs as the phenomenon that the cost increase with activity increase is more rapid than cost decrease with activity decrease (Anderson et al., 2003), the first objective of the paper is to detect whether the SGA are sticky by comparing the variation of SGA in the period when revenue increases with that in the period when revenue decreases.

H1: The increase in SGA following an increase in sales revenue is greater than the decrease in SGA following a decrease in sales revenue.

Presence of cost stickiness in one - time period only reflects the costs of maintaining unused resources when a revenue decline occurs. When the observation window includes several time periods, more complete adjustment cycles are captured. During longer time intervals, the managerial assessment about the permanence of a change in revenues become more precise and the adjustment costs become lower relative to the cost of keeping unused resources. Therefore, it is likely that cost stickiness is less pronounced when time periods are aggregated into two, three or four year periods, compared to one year period. Besides, the cost adjustment to revenue changes can occur in a lagged way.

H2: Cost stickiness declines with the aggregation of periods.

Changes in sale revenues can reflect short-term market conditions or structural shifts in demand for products and service. Managers, when observing a sales drop can wait for information which will allow them to assess the permanence of the demand fall before taking decisions on cutting resources. Such delays provoke cost stickiness since unused resources are kept during the period between the reduction in volume and the adjustment decision. A time interval between the decision of cutting resources and the effective cost reduction can also occur, since contractual commitments take time to be undone. A

consequence of the delay in taking decision and undoing contractual arrangements is that the asymmetric change observed in one - time period might be reverted in subsequent periods. In order to test this possibility, two hypotheses are established.

H3: There is a lagged adjustment of costs relative to revenue changes.

H4: Cost stickiness is reverted in subsequent periods.

According to the traditional analysis, cost and profit have a close relation, and any changes in cost will result in earnings volatility. Anderson et al. (2003) show that recognizing the influence of cost behavior affects the interpretation of SGA ratio (SGA / sales revenue). Changes in the ratio of SGA to sales revenue can be used as an indicator for cost control quality of firm management. An increase in the ratio of SGA to sales revenue indicates that firms have to spend more resources in conducting their sales activities and thus may reduce their profitability and that management is unable to adjust costs of doing business in recession. Failures to include flexibility factor in designing operating cost structure hurts firm financial performance in the long run. The increase in the ratio can also be interpreted as firms having difficulty in competing with their counterparts. Anderson et al. (2003) argue that this interpretation should be reverse during sales decreases. Managers retain more slack SGA resources when they are optimistic about future sales. An increase in SGA ratio during a revenue decreasing period constitutes a positive signal about future performance. As expected, the association between SGA ratio increase and future earnings is negative in revenue-increasing periods but positive in revenue-decreasing periods. Weiss (2010) examines how asymmetric cost behavior influences analysts' earnings forecasts. He argues that because cost stickiness magnifies the impact of sales decreases on earnings, firms that exhibit greater stickiness should have lower earnings predictability. Conversely, firms that have anti-sticky costs should have more predictable earnings. As expected, he finds that analysts' earnings forecast is affected.

H5: The stickiness of SGA affects the earnings per share.

3. Data and methodology

This paper employs log – linear regressions using panel data to test cost stickiness. An empirical model that enables measurement of how SGA responses to short time changes in sales revenue and diverges between periods when sales revenue increases and periods when sales revenue decreases is developed by Anderson et al. (2003).

Model (1)

$$log\ \frac{SGA_t}{SGA_{(t-1)}} = \beta_0 + \beta_1 * log\frac{Revenue_{i,t}}{Revenue_{i,(t-1)}} + \beta_2 * Dummy_{i,t} * log\frac{Revenue_{i,t}}{Revenue_{i,(t-1)}} + \varepsilon_{i,t}\ (1)$$

in which $SGA_{t,i}$ is the selling and administration costs of the i-th firm at time t; $Revenue_{t,i}$ is the net revenue of the i- th firm at time t; The interaction variable, $Dummy_{i,t}$, taking on the value of 1 when sales revenue decreases between periods (t-1) and t, and 0 otherwise. With hypothesis H1, the time period is one - year period.

In the case of reduction in sales revenue, managers may delay the adjustment of unutilized costs. Such delay leads to sticky costs. There may also be a time lag between the decision to reduce committed resources

and the realization of the change in costs. An implication of delayed decision-making and contracting lags is that the stickiness observed in one period may be reversed in subsequent periods. The ratio form and log specification improves the comparability of the variables across firms and alleviates potential heteroscedasticity. The log specification also accommodates economic interpretation of the estimated coefficients (Anderson et al., 2003). Because the value of $Dummy_{it}$ is 0 when sales revenue increases. The coefficient β_1 measures the percentage increase in SGA with 1% increase in sales revenue. Because the value of Dummyit is 1 when sales revenue decreases, the sum of the coefficients, $(\beta_1+\beta_2)$, measures the percentage increase in SGA with 1% decrease in sales revenue. If SGA are sticky, the variation of SGA with sales revenue increase should be greater than the variation for sales revenue decrease. Thus the empirical hypothesis for stickiness conditional on $\beta_1>0$ is $\beta_2<0$.

In order to test hypothesis H_2 that cost stickiness decreases with the aggregation of years per period, regressions were carried out with model (1) for aggregate periods of 2, 3 and 4 years.

In order to test hypotheses H_3 and H_4, model (1) is extended to include an additional variable designed to capture the one year lagged effect of changes in sales revenue on cost changes, which is presented as follows:

$$log\ \frac{SGA_t}{SGA_{(t-1)}} = \beta_0 + \beta_1 * log\frac{Revenue_{i,t}}{Revenue_{i,(t-1)}} + \beta_2 * Dummy_{i,t} * log\frac{Revenue_{i,t}}{Revenue_{i,(t-1)}} + \beta_3 * log\frac{Revenue_{i,(t-1)}}{Revenue_{i,(t-2)}} + \beta_4 * Dummy_{i,(t-1)} * log\frac{Revenue_{i,(t-1)}}{Revenue_{i,(t-2)}} + \varepsilon_{i,t}\ (2)$$

In model (2), the interaction variable, $Dummy_{i,\ t-1}$ takes the value of 1 when sales revenue decreases between periods (t-2) and (t-1), and 0 otherwise. Condition for acceptance of H_3 is $\beta_3>0$; of H_4 is $\beta_4>0$, with $\beta_4 < \beta_2$ in absolute value.

Model (3)

The statistic model for testing hypothesis H5 was derived to reflect the findings in Banker and Chen (2006) that the inclusion of different cost behaviors during periods in which revenue increases and when revenue decreases improves profitability forecasting. The dependent variable in the model is the future changes in earnings per share ($EPS_{i,\ t}$). The model is expressed as follows:

$$EPS_{i,t} = \beta_0 + \beta_1 Sticky_i + \beta_2 EPS_{i,t-1} + \beta_3 Lev_{i,t-1} + \beta_4 Size_{i,t-1} + \beta_5 Dummy_{i,t-1} + \varepsilon_{i,t}\ (3)$$

where $EPS_{i,\ t}$ and $EPS_{i,\ t-1}$ are earnings per share in year t and (t-1); $Lev_{i,\ t-1}$ is a ratio of total liabilities to total assets in year (t-1); $Size_{i,\ t-1}$ is the log total assets in year (t-1); $Dummy_i$ is equal to 1 if firm i has $Sticky_{i,t}$ positive, equal to 0 if otherwise.

The main independent variable $Sticky_i$ is measured in Banker and Chen (2006) as follows:

$$Sticky_i = \left(\frac{SGA}{Sale}\right) i, \Im - \left(\frac{SGA}{Sale}\right) i, \mathbb{T}$$

Where I is the closest year to 2015 when the sale decreases from the previous year; T: is the closest year to 2015 when the sale increases from the previous year.

If $Sticky_i$ is positive, the SGA cost is sticky. Otherwise, the SGA cost is anti-sticky.

4. Data and estimation results

To test the hypotheses, we employ the data of 2,350 listed companies in HOSE, HNX,

UPCOM and OTC in Vietnam from 2010 to 2015, data is extracted from StoxPlus[3]. We screened the data for missing observations and deleted observations before estimation if SGA exceed sales revenue and if earnings per share are negative. Table I provides descriptive information about the data for the period 2010 - 2015.

Table 1. Data and descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Revenue*	6,216	1,450	1,230	0	406,000
SGA*	6,227	90	9,970	0	1,100
ESP	6,115	6,251	374,948	0.	293,000,000
Sticky	6,204	-0.025	0.783	-11.671	18.2911
Lev	6,141	53.743	32.036	0.048	762.040
Log(Size)	6,141	26.641	1.456	20.688	34.265

Source: StoxPlus and Stata 12 estimation

Note: (*) Revenues and SGA are measured in billion VND; EPS is measured in VND.

Model (1) was estimated for one year periods and for aggregate periods of 2, 3, and 4 years, whereas model (2) was estimated for one-year periods only. The results are presented in Table II.

Table 2. Coefficient estimates of model (1) and (2)

Coefficient	Model (1)				Model (2)
	t= 1 year	t=2 years	t=3 years	t=4 years	t=1 year
β_0	0.0473 (0.000)	0.1322 (0.000)	0.1142 (0.000)	0.1822 (0.000)	0.0068 (0.6642)
β_1	0.3176 (0.000)	0.3535 (0.000)	0.4391 (0.000)	0.3106 (0.0072)	0.2790 (0.000)
β_2	-0.1499 (0.0052)	-0.2645 (0.001)	-0.3310 (0.0006)	- 0,2393 (0.0985)	-0.1598 (0.0510)
β_3					0.0635 (0.0236)

[3] StoxPlus, an associate company of Nikkei Inc. and Quick Corp., is a financial and business information corporation in Vietnam.

Coefficient	Model (1)				Model (2)
	t= 1 year	t=2 years	t=3 years	t=4 years	t=1 year
β_4					-0.0594 (0.1001)
$\beta_1 + \beta_2$	0.1677	0.089	0.1081	0.0713	0.1192
N	7,523	5,720	4,067	2,558	5,658
r2	0.1160	0.1094	0.1741	0.1327	0.0568

Note: The numbers in parentheses are p-value.

Source: Stoxplus and Stata 12 estimation

Results from model (1) for one-year periods, show that when sales revenue increases by 1%, costs will increase by 0.317%. In Anderson et al. (2003), β_1 is 0.545%. In Medeiros et al. (2004), β_1 is 0.593%. The estimated value β_2 is -0.1499, providing strong support to hypothesis H1 of cost stickiness. The combined value ($\beta_1 + \beta_2$) is 0.1677, showing that costs fell by 0.16% in response to a 1% drop in sales revenue. The fact that both β_1 and ($\beta_1 + \beta_2$) are significantly smaller than 1 shows that cost changes are not proportional to sales revenue changes, despite the relevance of this cost driver. With this result, the cost stickiness hypothesis H1, accepted in Anderson et al. (2003), is also accepted in this study. Comparing the value of ($\beta_1 + \beta_2$) from our study with those of Anderson et al. (2003), we can see that this coefficients' sum is always lower for Vietnamese firms and that the difference increases as the number of years per period increases. This is an indication that firms' cost stickiness is higher in Vietnam relative to the case of the U.S. (Anderson et al., 2003) and Brazil (Medeiros et al., 2004).

It can also be seen from Table II that cost stickiness falls with the aggregation of years per period, which is accepted in Anderson et al. (2003), is rejected for model (1) in our study with common intercept. In our study, β_2 increases in absolute value, showing that the cost stickiness gets worse as aggregation of years per period increases, whereas β_2 in model (1) decreases in absolute value as the number of years per period increases, as having seen in Anderson et al. (2003).

Model (2), which includes revenue changes lagged by one period, was used to test hypothesis H3 that cost stickiness is reverse in subsequent periods. In estimating model (2) with common intercept, we find that β_1 is 0.279, which is smaller than that obtained for model (1). Coefficient β_2 is - 0.1598, confirming cost stickiness in model (2). Nevertheless, in model (2), β_3 is 0.0635, which is significant leading to the acceptance of H3. A significant and negative β_4 confirms the sticky costs in the period subsequent to a sales revenue drop, which leads to the rejection of H4. This result does not support that the cost stickiness of selling and administration costs in listed companies in Vietnam is more serious than in the U.S.

Table 3. Coefficient estimates of model (3)

Coefficient	Model (3)	Model (3a) with Sticky > 0	Model (3b) with Sticky < 0
β_0	-25,228,349	-87980.820	-382,101.470
β_1	-16,809,560	-441,978	-247,408
	(0.000)	(0.551)	(0.000)
β_2	-6.039	-3.091	0.185
	(0.000)	(0.749)	(0.000)
β_3	30,509.642	1,214.773	546.287
	(0.000)	(0.598)	(0.000)
β_4	374,536.530	3,385.770	11,525.760
	(0.000)	(0.796)	(0.000)
β_5	24,207,872		
	(0.000)		
N	3,949	2,150	1,799
AR(2)	0.285	0.856	0.176
Hansen Test	0.872	0.997	0.058

Source: StoxPlus and Stata 12 estimation

Note: The numbers in parentheses are p-value.

Model (3) in Table III presents the results of the regression estimation. The estimated coefficient on the cost stickiness β_1 is positive and significant at 1% level. The finding that cost stickiness provides negative signal regarding future profitability support hypothesis H5 that an increase in the ratio of SGA to sales revenue is related to a decrease in future firm profitability.

To affirm the result, we split the sample into two firm groups with positive Stickyi in model (3a) and negative Stickyi in model (3b). We expect that in the case of positive stickiness, Stickyi will negatively affect the probability of firms. The coefficient β_1 in model (3a) is, however, insignificant. We aslo expect that in the case of negative Stickyi, it will positively affect the probability but the coefficient β_1 in model (3b) is negative and significant, which is against the theory. To explain the results, we may do further study. We should collect more data, extend the time periods of observations, and focus on the industry differences in our analysis.

5. Conclusions

The results in this paper show that for Vietnamese listed companies, SGA cost stickiness exists and it is stickier compared to that in the U.S. and Brazil as described in Anderson et al. (2003) and Medeiros et al. (2004). It implies that our managers have

late responses to the changes of the market reduction. The managers may not realize the sticky cost phenomenon, or because of managers' assessment of temporary decline in demand, they delay to cut off the unutilized resources in weak demand situations. The empirical results also document that sticky cost phenomenon in Vietnam has certain impact on the firm probability. This finding is in alignment with the case of Indonesia in the study of Warganegara and Tamara (2014). To limit the effects of cost stickiness in the context of demand reduction, we recommend the followings.

Firstly, firm managers should evaluate the demand of market annually and make the decisions on how to adjust the cost structures. If there is a short-term reduction, the managers may consider the adjustment cost and the loss of cost stickiness before making a decision to change the cost structure. In the circumstance of long-term reduction of market demand, managers need to reallocate the resources, and those contracts should be flexible and adjustable in order to cut off the adjustment costs.

Secondly, firms need to build up a flexible cost structure in order to explore market advantages during market growth and restrain effects of revenue reduction. The paper suggests two ways: (1) Transforming a certain portion of fixed costs to variable costs by creating a contingent labor pool, outsourcing of activities, or deploying software as a service; (2) Increasing productivity via economies of scale or extended working hours.

Thirdly, firms should apply modern management methods such as JIT (Just-In-Time) to minimize the inventory costs or ABC method (Activity-Based Costing) to eliminate non-valuable activities and allocate costs more precisely.

Lastly, together with the above mentioned solutions, firms should choose a flexible selling mechanism with the combination between internal selling staff and outsourced selling forces to maximize the efficiency and effectiveness.

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