



How Does Research in Sticky Cost Develop? A Review of Major Themes

Riha Dedi Priantana^{1*}, Sayuthi²
Universitas Syiah Kuala, Banda Aceh, Indonesia
*Corresponding Author: rihadedi@fe.unsyiah.ac.id

Abstract

Objective – This research aims to review the development of sticky cost research up until the last few decades. In general, sticky cost research has developed from one area, the existence of sticky costs, into two areas, namely determinants of sticky costs and the consequences of sticky costs.

Design/methodology – Literature review was conducted to describe sticky cost research. The sticky costs' existence is more intended to ascertain whether sticky costs occur or not, while determinant research is more focused on analyzing the factors that cause sticky costs. The consequence research aims to investigate the impact of sticky costs. This consequence research has touched on research issues in financial accounting, such as earnings predictions, abnormal price predictions.

Results – Sticky cost research has experienced significant development, not only related to three areas but also the issues of each one, such as cost management accounting, including other studies in the area of corporate strategy and financial issues. Sticky cost research itself is predicted to be one of the interesting research topics in accounting for the next decades.

Limitation/Suggestion - This study focuses on sticky cost research in relation with original research of sticky cost, and particularly conducted in developed countries, such as United States, England, and Australia. Forthcoming research would also consider any other countries about how sticky research is being progressed hence it may add knowledge of sticky cost research in overall.

Keywords: Sticky Cost, Existence of Sticky Cost, Determinant of Sticky Cost, Consequence of Sticky Cost.

1. Introduction

Sticky cost has been an issue of cost behavior research studies for several decades since it was first raised by Anderson et al. (2003). Anderson et al. (2003) conducted a review of the behavior patterns of sales, general and administrative costs of the company and found an asymmetrical pattern of behavior, called sticky costs. Sticky cost is defined as a pattern of cost behavior where costs increase more than decreases, despite changes in amounts that are almost equivalent (Anderson et al., 2003; Bugeja, Lu, & Shan, 2015; Cannon, 2014; Weiss, 2010). Sticky cost is the behavior of a cost whose occurrence is unique and relative. Sticky costs consider the direction of change in company activity, where a decrease or increase in sales also determines the size of the costs (Anderson et al., 2003). As a consequence, changes in costs do not occur automatically as explained by conventional cost behavior. This conventional view argues that changes in costs follow changes in the level of activity automatically (Anderson et al., 2003; Banker & Byzalov, 2014). According to Banker & Byzalov (2014), sticky cost happens is relative because it does not always occur in every situation and condition of the firm. Banker & Byzalov (2014) states that sticky costs vary between companies over time and also between industries, between countries. Therefore, research on sticky costs is interesting to investigate particularly on its occurrence.

Research on sticky costs began to emerge with a variety of settings and contexts after the publication of research results (Anderson et al., 2003). This study aims to try

to group these sticky cost studies into 3 (three) area categories, as suggested by Anderson et al. (2003) themselves regarding further sticky cost research. The first category is research that aims to re-investigate the existence of sticky costs, while the other category groups focus on efforts to identify the factors that cause sticky costs (determinant). A third category is a research group-oriented to testing the impact of the occurrence of sticky cost itself, named as consequences.

2. Sticky Cost Research

The Existence of Sticky Cost Research

The idea of the disproportional cost was firstly found by Noreen & Soderstrom, (1997). Then, Anderson et al. (2003) develop this cost's idea and divide the sticky cost research group more focused on testing the consistency of research findings. Some of these studies use various levels of unit analysis, ranging from departmental, corporate and industrial scales, even more to international level comparisons among-between countries. This group also involves various items of company costs, such as account sales, general and administrative costs, operational costs, labor costs, cost of goods sold, research and development costs, and advertising costs (Balakrishnan & Gruca, 2008; Banker, Byzalov, & Chen, 2013; Bugeja et al., 2015; Calleja, Steliaros, & Thomas, 2006; He, Teruya, & Shimizu, 2010; Subramaniam & Watson, 2016).

For example, Balakrishnan & Gruca (2008) tested sticky cost levels at 189 hospitals in Ontario from 1986 to 1989 and managed to find that costs directly related to patients experienced a higher level of sticky costs compared to the type of additional cost groups and departmental support costs. Subramaniam & Watson (2016) also find empirically that sales, general and administrative costs incurred a sticky cost for service companies, but this type of cost does not have sticky costs in financial companies. Moreover, Subramaniam & Watson (2016) shows the cost of goods sold has sticky behavior for financial companies, but a relatively small sticky cost for service companies.

The sticky cost research group is dominated by testing at the company level and also at the international level, one of them, Bugeja et al. (2015) and Banker & Byzalov (2014). Bugeja et al. (2015) found that the level of sticky costs in Australian companies increased with the intensity of the assets and employees of the company and decreased when income decreased in the previous period, and there was also a strong incentive for managers to avoid declining profits or losses. The empire-building behavior and the corporate governance environment of the company have affected the firm's level of sticky cost (Bugeja et al., 2015). Cost stickiness occurs in almost every country, although it varies based on differences in the characteristics of each country, such as labor protection regulations, legislation systems and governance of a country, even considering the growth of a country's gross domestic product (Banker & Byzalov, 2014; Banker et al., 2013; Calleja et al., 2006).

The concept of sticky cost itself has also been adapted to other areas, such as an audit. (Villiers, Hay, Zhang, & Authors, 2014) found that audit fees have sticky behavior because audit fees did not decrease fully adjusting to the level decreased of a predicted audit fee model, especially in the first year of the assignment. This sticky level of audit fees continues to decrease when in the second year and disappears in the four-year audit period because the client audit fees follow the audit fee model for accounting firms that do not experience audit changes (non-switching). As a summary, the results of research into the existence of sticky cost can be seen in table 1 as follow:

Table 1. Existence of Sticky Cost

No	Author(s)	Research Issue	Methods	Result
1.	Noreen and Soderstrom. 1997	Proportional cost model	Survey on 108 hospitals 1977 - 1992	The study also finds modest evidence of costs changes.

No	Author(s)	Research Issue	Methods	Result
2	Anderson, Banker and Janakiraman. 2003	Sticky cost	Survey on 64,663 for 7,629 firms.	Costs increase more than they decrease when activity rises rather than when business falls
3	Balakrishnan, R., and T. S. Gruca. 2008.	The stickiness of costs in hospitals	Survey on 189 general hospitals	Stickiness of costs is related to direct patient services rather than ancillary and support departments.
4	He, D., J. Teruya and T. Shimizu. 2010	Cost stickiness	Survey on 35,510 firm-years for 1802 firms.	Japan has lesser SGA cost stickiness than does America
5	Balakrishnan, R., E. Labro and N. S. Soderstrom. 2014	To test the mechanical stickiness model	Survey on 132,745 firm-year	Fixed costs are significant for cost stickiness
6	De Villiers, C., D. Hay and z Zhang. 2014	To examine the stickiness of audit fee	Survey on 30,298 firm-year observations representing 5,568 firms in the USA	Audit fees are sticky.

Source: Research Summary (2020)

Based on the research results on the existence of sticky cost, it shows that sticky cost is true at the level of departments, business units and companies. Besides, this cost behavior can occur in cost components, such as selling, general and administration costs, operational costs, research and development costs, and total costs.

Determinant Sticky Cost Research Group

The second group of sticky cost research is aimed at identifying the factors that cause sticky cost, named as determinant sticky cost. Based on a review of this group's study, the causes of sticky costs have been dominated by resource adjustment costs' explanations. This theory explains that the occurrence of sticky cost is more due to the consideration of the cost by the manager. Companies delay resource reductions when sales drop due to large costs when companies reduce resources.

Banker & Byzalov (2014) proves that asset and employee intensity affect the sticky cost of almost all companies in 20 countries, both developing countries and countries have not developed. The findings show that asset and employee intensity become a consideration in the results of sticky cost. Also, Subramaniam & Watson (2016) also supports these findings, even they reinforce the cost consideration it can be due to the industrial characteristics by which the company resides.

Using selling, general, and administrative costs (SG&A) and cost of goods sold (CGS) within the determination of sticky cost in the company, Subramaniam & Watson (2016) found that the manufacturing industry has the highest level of the sticky cost than other industries. This is under the characteristics of the manufacturing industry that is dominated by the existence of assets and employee intensity as the main capital in production. The lowest level of sticky cost is in the trading industry (merchandising industry), while the financial industry and services only show the level of moderate sticky cost.

In general, it can be concluded that the theory of the adjustment of the resource uses such as asset intensity, labor intensity, labor regulations, characteristic industry,

and demand uncertainty within the determination of the company's sticky cost (Anderson et al., 2003; Banker & Byzalov, 2014; Banker et al., 2013; Subramaniam & Watson, 2016).

Another explanation for the causes of sticky cost is also based on the consideration of current capacity utilization of the company. This explanation describes that sticky cost occurs especially when companies are operating at full capacity (Balakrishnan, Petersen, & Soderstrom, 2004; Cannon, 2014; Weiss, 2010). According to this argument, the actions of managers who maintain the capacity of the resources are unemployed when sales decline; vice versa, then, managers add new resource capacity when the sales increase based on the current period capacity utilization of the company, especially in at their full capacity, causing sticky costs (Balakrishnan et al., 2004; Cannon, 2014).

The first sticky cost researcher investigating this resource capacity group is (Balakrishnan et al., 2004). Balakrishnan et al. (2004) uses a percentage of the average change in energy hours of Kerjavdan the cost of energy salaries therapists from 49 therapy clinics, consisting of monthly costs, salary costs, number of patient visits, and found that the clinic with normal capacity utilization cannot be concluded in response to the decline of activity levels similar to the response to increased activity levels. Besides, their research suggests that clinics experiencing strained resources show less response to reduced activity levels significantly relative to responses to increased activity. This results in supporting the company's sticky cost phenomenon. So, sticky costs occur only when the company conducts business at full capacity.

Furthermore, the study of Balakrishnan et al. (2004) found that when the clinic experienced excess capacity, the company's response to a decline in activity levels was significantly greater than the response to increased activity. This is in stark contrast to the sticky cost. Balakrishnan et al. (2004) argue that The companies operating below normal capacity when sales decline, the company's managers immediately eliminate the capacity of these resources and do not consider the possibility of sales increases in the next period, causing the emergence of anti-sticky costs.

Weiss (2010) uses 2,520 companies in a quarterly and explicitly finds the measurement of sticky cost based on quarterly for each company to distinguish between periods of the period of sticky cost and anti-sticky cost. The results of Weiss's research (2010) showed that the anti-sticky phenomenon costs caused analysts to predict revenue more accurately 25% compared to the predictions of the company's revenue with the sticky cost.

More specifically, Cannon (2014) used the 504 observation quarterly from 9 airlines and found that anti-sticky costs behavior occurred when the manager reduced costs more by reducing capacity when the demand was reduced in capacity when demand grew. So, it can be concluded that the occurrence of anti-sticky costs arises when the company is in excessive capacity (Balakrishnan et al., 2004; Weiss, 2010).

The last perspective in the group that causes sticky costs is the managerial incentives' perspective. As stated by Anderson et al. (2003) that the sticky cost may be caused by the self-interest of managers. Managers are more likely to maintain these unused resources as a means of protecting their self-interests from cutting and reducing budgetary resources so that they preserve their status in the market the workforce. The managerial incentives perspective uses an explanation of agency problems because managers' deliberate decisions to avoid reducing resources become an explanation of the occurrence of sticky costs themselves (Anderson et al., 2003; Kama & Weiss, 2013).

Some research also attempts to investigate the causes of sticky costs using managerial incentives to achieve specific targets, such as Dierynck et al. (2012), Chen et al. (2012), Kama & Weiss (2013). Chen et al. (2012) found strong evidence that sticky costs occur due to empire-building behavior. Self-interested manager affects the

higher the occurrence of sticky costs in the behavior of costs in the company (Chen et al., 2012).

Agency cost are defined as the sum of 1) agreements, 2) monitoring cost and agreements to reduce cost incurred due conflicts of interest and 3) residual loss incurred, because it is not generally possible to resolve the interests of agents with the principal perfectly (Linda, Afrianandra, Fitria, & Yulia, 2020).

Chen et al. (2012) argue that agency cost in which manager's actions not to adjust company's resources when revenue declines, but immediately add resources when revenue increase motivated by manager's interests, such as fear of losing position, loss of image positive and loss of status and loss of benefits received. As a result, the manager makes adjustments to the resource immediately when sales decline and sticky cost can incur because of agency costs (Anderson et al., 2003; Chen et al., 2012).

Dierynck et al. (2012) examined the effect of managers' push on individual target earnings and sticky costs through the company's labor cost component to companies not listed on the stock exchange in Belgium. Dierynck et al. (2012) managed to find empirically that companies with the ability to meet break-even earnings targets, neither profit nor loss, tended to have relatively small sticky costs. This company tends to reduce resource capacity when activity increase and retain fewer resources when activity decline. Manager's consideration aims to achieve break-even earnings targets so that the pattern of cost changes becomes symmetrical. They also found that companies that experienced little loss or had large profits showed significant sticky cost behavior. This company wants to maintain a good company reputation, thereby limiting the reduction in labor, but only adjusting the number of hours worked.

Different from (Chen et al., 2012; Dierynck et al., 2012), Kama & Weiss (2013) test managers' drive to achieve more specific earnings targets by grouping them into 3 (three) categories, namely avoid decreasing earnings, avoid losses, avoid reduced earnings or losses. Kama & Weiss (2013) found that the desire to achieve certain earnings targets has encouraged managers to reduce resources excessively, especially when reducing sales rather than consider optimizing the value of the company's interests, thereby reducing the occurrence of sticky costs even though this decline is temporary. The action to accelerate the reduction of resources is motivated by the drive to achieve earnings targets because when there is no encouragement to achieve these earnings targets, managers do not reduce resources when sales decline, causing sticky costs to occur (Kama & Weiss, 2013). In summary, the results of the determinant sticky cost research can be seen in table 2 below.

Table 2. Determinant of Sticky Cost Research

No	Author(s)	Research Issue	Methods	Result
1	Balakrishnan, R., M. J. Petersen and N.S. Sodersron. 2004	Sticky cost on clinic-level	Survey on 1,898 from 49 physical therapy clinics	The level of capacity usage affects sticky cost, in which full capacity causes sticky cost, while idle capacity does not cause sticky cost.
2	Dierynck, B., W. R. Landsman and A. Renders. 2012	Managerial incentives and Cost behavior	Survey on sample 37,880 of 51,826 firm-year	Firms with small earning show symmetric cost than large-profit firms
3	Chen, H. Lu and T. Sougianns. 2012	Agency cost and sticky cost behavior	Survey on our sample covers 5,278 firm-year observations	Manager's empire-building behavior drives sticky cost
4	Kama, I and D. Weiss. 2013	Earning target and sticky cost	Survey on 97,547 firm-year observation	Earning target reduce the level of sticky cost

No	Author(s)	Research Issue	Methods	Result
5	Banker, R.D., D. Byzalov and L.T Chen. 2013	The economic incentive of sticky cost	Survey on 128,333 observations for 15,833 sample	The higher of Employment Protection Legislation level, the more level of sticky cost
6	Banker, R.D and D. Byzalov. 2014	Examining of asymmetric cost at international level	Total survey on 315,967 firm-year observation from 2,412 firm-year observation in Indonesia to 133,590 for the US	Asymmetric cost behavior is determined by the level of asset intensity, employee intensity, and empire-building behavior.
7	Cannon, J.N. 2014	Sticky cost in airline expense	Survey on 504 from nine airlines	Capacity expense drive sticky cost behavior in the airline industry
8	Banker, R. D., D. Byzalov, M. Ciftci, and R. Mashruwala. 2014.	Two-period specification of sticky cost of Anderson, Banker and Janakiraman model	Survey on 156,689 firm-year observations for 18,066	Two-period cost response to sales decreases reduces the level of sticky cost.
9	Bugeja, M., M. Lu and Y. Shan. 2015	The phenomenon of sticky cost in Australia	Survey on 171 095 firm years.	Type of industry might cause the level of sticky cost. Manufacturing, services and other industries have sticky level, meanwhile resources, construction and retail industries don't have sticky cost behavior.
10	Subramaniam, C., and M. Weidenmier. 2016.	Industry classification on sticky cost behavior	Survey on 82,118 observations for 9,592 firms.	Cost classification determines the sticky cost. Selling, general and administration cost has sticky cost for service firms, not in financial ones. CGS is also sticky cost for financial firm, and only marginally for service firm.

Source: Research Summary (2020)

According to this second group, the research results of sticky cost determination can be distinguished based on the theories of causes of sticky cost. First, the theory of adjustment of resources. This theory is widely used to describe asset intensity, labor intensity, labor regulations, characteristic industry, and demand uncertainty (Anderson et al., 2003; Banker & Byzalov, 2014; Subramaniam & Watson, 2016). Second, resource capacity usage. Explanation of this theory is aimed at detecting when the occurrence of sticky cost based on capacity characteristics that occur in the company, even the theory can predict the phenomenon of anti-sticky cost (Balakrishnan et al., 2004; Cannon, 2014; Weiss, 2010). Third, a sticky cost can be explained based on the managerial incentives' perspective (Anderson et al., 2003; Chen et al., 2012; Dierynck et al., 2012; Kama & Weiss, 2013). Based on the explanation determinant this sticky cost can be concluded that the effect of sticky cost can be driven by a positive perspective of the company's manager, and can also be caused by negative encouragement from the manager itself.

Consequences Sticky Cost Research Group

The third group of sticky costs is related to research that identifies the consequences of the presence of sticky costs. The research group on the effects of sticky cost linkages is still dominated by financial accounting topics, particularly research that examines on the sticky costs' effect on earnings, such as earning predictions, analysts' forecasts of earnings, earning management, earning surprises, to the issue of conservatism in accounting. This research area group examines the link between management accounting and financial accounting through sticky cost research topics (Banker, Basu, Byzalov, & Chen, 2016; Banker & Chen, 2006; Ciftci, Mashruwala, & Weiss, 2016; Kim & Prather-Kinsey, 2010; Weiss, 2010). It was found that it was infrequent to test the direct impact of sticky costs on company performance in this area of sticky costs' consequences. In summary, the results of the study of sticky cost consequences can be seen in table 3 below.

No	Author(s)	Research Issue	Methods	Result
1	Banker, R.D dan L.Chen. 2006	Variability and Stickiness Cost on selling and earning	Survey on 39,367 firm-year from 8,771 firms	Cost variability and cost stickiness model provide a better prediction of the market's earnings expectations on equity than do any models in income and cash flow statements.
2	Weiss, D. 2010	A measure of sticky cost for firm-level.	Survey of 44,931 for 2,520 firms	Firms with more sticky cost and less earning forecast accuracy do have less analyst coverage and less weak respond to surprises of earning
3	Kim, M and J.Prather-Kinsey. 2010	Analysts' earnings forecast errors	Survey on 1,467 analysts about 3,220 sales.	Analysts' earnings forecast error positively relates with the growth of sales because of fixed-cost intensity.
4	Banker, R.D, S. Basu, D. Byzalov and J.Y. Chen. 2015	The confounding effect of sticky cost in the conservatism concept	Survey on 55,448 firm-year observations	Conditional conservatism should recognise the impact of sticky costs.
	Ciftci, M., R. Mashruwala and D. Weiss. 2016	The prediction of expense in the forecasts of earnings.	Survey on 107,577 quarter observations	Systematic errors expenses bring about error of earnings forecast in unfavorable rather than in favorable.

Source: Research Summary (2020)

Banker & Chen (2006) was the first researcher to try to connect sticky cost and the prediction of earning a year ahead at the company's level using the data panel. The results of their research found that predictive models based on variability and cost stickiness (CVCS) predict the return one next year 30% more accurately than the return prediction model using profit and loss statements. This suggests that financial analysts have the advantage of the information in forecasting next year's return compared to other models that use the items in the income statement and statements of cash flows.

Weiss (2010) uses a 44.931 observation panel based on quarterly data to test the sticky cost and predict the analysis of the company's earning. In a different manner to research by Banker & Chen (2006), the study found that companies with high costs

sticky have less accurate earning predictions, have lower analyst coverage. In addition, the study found a weaker market response for-profit surprises (earnings surprises) for companies with costs sticky behavior. Weiss's Findings (2010) shows that cost behavior can constitute investor confidence in the company's value.

Ciftci et al. (2016) Continued research on the consequences of sticky cost on predictive analysis of earning by using comparisons between unfavorable conditions compared to favorable conditions of sales shock in equal quantities. Ciftci et al. (2016) found that the average approximate error of income when actual sales exceeded that estimate by 1.5 per cent to 2 per cent, i.e. 2.69 times with the opposite signs. These results indicate that a systematic error in predicting costs caused a substantial income error when sales changed to worse with unfavorable scenarios.

Specifically, Banker et al., (2016) tested a sticky cost against the estimation of conservatism using the regression modes of (Basu, 1997). The study provided evidence that conditional conservatism in the model Basu. The degree of variation in conservatism in industries and companies changed drastically when incorporating variations in cost stickiness. The research also provides evidence that cost stickiness distorts conclusions about triggers of conservatism standards such as book-to-market ratios, leverage, and size, managerial holdings that correlate with conservatism.

3. Conclusion, Limitation, and Suggestion

In conclusion, this research aims to review the development of sticky cost research up until the last few decades. In general, sticky cost research has developed from one area, the existence of sticky costs, into two areas, namely determinants of sticky costs and the consequences of sticky costs. The important issue of sticky cost is the manager's actions to maintain unused resources in the company in a decline in sales and to increase resources when the increase in sales is a form of recognition of the manager's participation in the unfavorable process explicitly (Anderson et al., 2003; Banker & Byzalov, 2014; Banker, Byzalov, Ciftci, & Mashruwala, 2014; Cannon, 2014).

The various motives and considerations underlying managers have led to various studies on sticky costs (Balakrishnan et al., 2004; Cannon, 2014; Chen et al., 2012; Dierynck et al., 2012; Kama & Weiss, 2013). Furthermore, Anderson et al. (2003) mention the motives that drive the manager's actions based on consideration of resource adjustment costs, as well as consideration of personal interests (self-interest). The emergence of sticky cost itself has provided another alternative explanation differing from conventional cost behavior.

This current research has reviewed mostly in the articles published in developed countries, such as French, German, The United State of America, United Kingdom's ones, Japanese and Australia. Therefore, future research might highlight the sticky cost phenomenon in other developing countries as the comparison, in term of the existence of sticky costs, determinants of sticky costs and the consequences of sticky costs.

Future research in sticky cost may also encourage other issues, such as characteristics and the existence of sticky costs, the causes of sticky costs and the consequences of sticky costs. Besides, the use of various theoretical background explanations and different important research methods is applied to sticky costs in the hope of increasing knowledge about, such as multiple specific situations which include the company level, industry level, country level and even the level of comparison between countries.

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