

Research on Cost Stickiness in International Journals: A Bibliometric Study

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Abstract

Contemporary points of view have posited that cost behavior is asymmetrical and tends to be sticky. The purpose of this study is to determine the development of cost behavior research, especially about cost stickiness, in reputable international journals. There are 142 articles that meet the criteria which have been obtained from the Scopus database. Bibliometric analysis has been performed with the help of the VOSviewer application. The results of the analysis show that research related to cost stickiness has increased in the last decade. The cost stickiness research consists of the following clusters: 1) the health industry; 2) labor costs; 3) social, environmental and sustainability issues; 4) corporate governance; 5) specific problems in manufacturing; and 6) leadership characteristics. The topics of research on cost stickiness that are still being researched are related to the role of the environmental community, business strategy, and the role of managerial leadership. In this analysis, the authors also show that articles that treat cost stickiness as an independent variable are limited. Based on the results of this analysis, we provide suggestions regarding opportunities for research on cost stickiness in the future.

Keywords: *Asymmetrical Cost Behavior; Bibliometric; Cost Stickiness; Scopus*

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INTRODUCTION

Research over the last two decades has found fairly solid evidence that cost behavior is asymmetrical. Contrary to the viewpoint of the symmetrical cost behavior theory, recent research has found that changes in costs resulting from increases and decreases in sales, in the same percentage, are not symmetrical. This form of cost behavior asymmetry can lead to sticky, anti-sticky, or even super sticky traits. Sticky cost behavior occurs when the amount of change in costs, when there is an increase in sales, is greater than the decrease in costs when there is a decrease in sales. On the other hand, in an anti-sticky condition, the fall in

costs when sales decline exceeds the increase in costs when sales increase. In extreme conditions (i.e., super sticky), when there is a decrease in sales, costs actually increase.

Until now, textbooks on cost accounting and management have omitted any discussion of sticky behavior (Bhimani et al., 2019; Drury, 2018; Hanif, 2018). Indeed, research demonstrating sticky cost behavior has been underway since 2003 (Anderson et al., 2003). Unlike other research in the field of economics, studies related to cost stickiness have not been able to reach definitive conclusions about the causes of this behavior. Even so, some researchers who believe in the existence of cost stickiness have examined its impact on both company performance and market performance. To be recognized in cost accounting and management textbooks, researchers must conduct more intensive sticky cost research. As a result, we need to map the research on cost stickiness conducted by researchers. The purpose of this study is to determine the development of cost behavior research, especially into cost stickiness, in reputable international journals. In addition, this study is also expected to provide an overview of what the topics related to cost stickiness are that have been researched where the findings have then been published in reputable international journals.

To get an overview of the research on cost stickiness, the authors used Scopus as the database for retrieving data on articles. Data processing has been done with the help of the VOSviewer application. An analysis of the 142 articles found shows that, currently, there is a tendency for cost stickiness research to examine industries related to the state/government, as well as the role of leaders in causing cost stickiness. Aside from this, although it is limited, some recent research on cost stickiness has also looked at the effect of sticky cost behavior on the performance of companies, markets, and even the national economy.

Using a bibliometric approach, the authors obtained the following information: 1) publication structure and journal citation; 2) authorship; 3) development of cost stickiness research during the last two decades; 4) clustering in cost stickiness research; and 5) research topics that could be opportunities for further investigation. Apart from using the VOSviewer-based bibliometric analysis, the authors also investigated two types of treatment for the cost stickiness variable used by previous researchers. Using this description, students who are interested in researching cost stickiness can find out about trends in the relevant research and consider the advice the authors provide.

RESEARCH METHOD

This study uses a bibliometric approach to look at literature growth, authorship patterns, and citation patterns (Mukherjee, 2010). Bibliometric analysis is commonly used in a study when one wants to know the development of research into a topic. This is evident from the finding of 2,440 articles discussing bibliometric studies in the fields of business, management, and accounting in journals indexed in Scopus (as of 27 March 2021). To perform bibliometric analysis, the authors used the VOSviewer program commonly used by other researchers.

The authors used the Scopus database in order to retrieve data in the form of articles. The keywords used were sticky cost, or cost stickiness or asymmetric cost behavior in the title, abstract, or article keyword. We only used writing in the form of journal articles and published in English. The commands used in the article search process are as follows. TITLE-ABS-KEY (“sticky cost” OR “cost stickiness” OR “asymmetric cost behavior”) AND (LIMIT-TO (DOCTYPE, “ar”)) AND (LIMIT-TO (LANGUAGE, “English”)). The number of articles that meet these criteria is 142 as of 3 March 2021. The articles obtained from the Scopus database were then exported in CSV format to make it easier for the VOSviewer program to read each one’s metadata.

RESULTS AND DISCUSSION

The result of the first analysis was obtained from looking at the structure of the publication of articles on the topic of cost stickiness. The authors started by looking at the growth trend of cost stickiness articles from over time. According to **Table 1**, there has been a significant growth in cost stickiness research over time. The pioneering cost stickiness research was published in 2003 by Anderson et al.; however, this only underwent development starting in the 2011 period. Very significant growth occurred starting in the 2015 period, where the number of articles almost doubled (179%) from the previous period. This significant increase in cost stickiness research is most likely due to management accounting researchers becoming aware of the subject. While research in management accounting is frequently conducted using company-specific data, cost stickiness research can be conducted using publicly available report data. Banker, one of the pioneers of cost stickiness research, began actively publishing his findings at this time, inspiring other researchers to conduct cost stickiness research as well. This shows that studies on cost stickiness are still in demand by researchers and the subject continues to experience significant developments.

Table 1. Growth in Number of Cost Stickiness Articles in the Five-Year Period*

Period	Number of Articles	Average per year
Up till 2005	4	0.8
2006 - 2010	8	1.6
2011 - 2015	33	6.6
2016 - 2020	92	18.4

* There have been 5 articles published in 2021.

Next, the authors looked at the distribution of articles obtained for this study as shown in **Table 2**. The topic of cost behavior was generally discussed in the group of articles on management accounting, so a lot of articles containing research in this field were published in management accounting journals (12 articles). When considering the country of origin of the article, the United States, Korea, and China are the top contributors (43, 26, and 21, respectively). The dominance of these three countries is believed to be related to the ease with which data on cost stickiness can be accessed. For instance, in America, compustat is a well-known central financial database that is easily accessible to researchers. Additionally, some research on cost stickiness in China and Korea ties it to the country's unique corporate governance, making it an intriguing subject to study (Chung et al., 2019; Kim et al., 2019; Liu et al., 2019; Xue & Hong, 2016).

Table 2. Distribution of Cost Stickiness Articles

No.	Source	Number of articles	Number of citations
1	Journal of Management Accounting Research	12	285
2	Academy of Accounting and Financial Studies Journal	6	16
3	Accounting and Finance	5	36
4	China Journal of Accounting Studies	5	7
5	Journal of Management Control	5	31
6	Asia-Pacific Journal of Accounting and Economics	4	10
7	Information (Japan)	4	2
8	Management Accounting Research	4	131
9	Sustainability (Switzerland)	4	6
10	Applied Economics	3	12
11	Contemporary Accounting Research	3	89
12	International Journal of Accounting	3	23
13	Journal of Accounting Research	3	419
14	Journal of Accounting, Auditing and Finance	3	85

Source: VOSviewer

To see the influence of cost stickiness articles in each journal in terms of the development of research, the authors looked at the number of citations of their articles according to the journals themselves. **Table 3** shows the top ten in terms of number of journal citations of articles on cost stickiness. According to **Table 3**, the Journal of Accounting Research has the largest number of citations, even though it has only three cost stickiness articles, so the average is 140 citations per article. This is followed by the Journal of Management Accounting Research with 285 citations of 12 articles (24 citations per article on average). Next is the Journal of Accounting and Economics, Accounting Review, and Management Accounting Research.

Table 3. Ten Journals with The Highest Number of Citation for Cost Stickiness Articles

No.	Source	No. of articles	No. of citations	Average
1	Journal of Accounting Research	3	419	140
2	Journal of Management Accounting Research	12	285	24
3	Journal of Accounting and Economics	2	161	81
4	Accounting Review	2	155	78
5	Management Accounting Research	4	131	33
6	Contemporary Accounting Research	3	89	30
7	Journal of Accounting, Auditing and Finance	3	85	28
8	Accounting and Finance	5	36	7
9	Journal of Management Control	5	31	6
10	International Journal of Accounting	3	23	8

Source: VOSviewer

To find out which articles are most dominant in influencing cost stickiness research, **Table 4** presents a list of the ten articles with the most citations. An article by Anderson, Banker, and Janakiraman (2003), who were pioneers of cost stickiness research, is

at the top in terms of the number of citations. Although based on bibliometric analysis, it can be seen that research related to cost stickiness had existed before, but the research by Anderson et al. (2003) explicitly examines the details of the occurrence of cost stickiness and formulates the Anderson sticky model. Previous research was conducted by West (2003) and West et al. (2002), but it did not directly examine the existence of cost stickiness. However, in their research they had acknowledged its existence.

Table 4. Cost Stickiness Articles with the Highest Impact Factors

No.	Author(s) and Year	Title of Article	Citations
1	(Anderson et al., 2003)	Are selling, general, and administrative costs "sticky"?	310
2	(Weiss, 2010)	Cost behavior and analysts' earnings forecasts	121
3	(Banker et al., 2013)	Employment protection legislation, adjustment costs and cross-country differences in cost behavior	113
4	(Kama & Weiss, 2013)	Do earnings targets and managerial incentives affect sticky costs?	108
5	(Calleja et al., 2006)	A note on cost stickiness: Some international comparisons	99
6	(Banker et al., 2014)	The moderating effect of prior sales changes on asymmetric cost behavior	84
7	(Banker & Byzalov, 2014)	Asymmetric cost behavior	83
8	(Anderson et al., 2007)	Cost behavior and fundamental analysis of SG&A costs	83
9	(Balakrishnan & Gruca, 2008)	Cost stickiness and core competency: A note	77
10	(Balakrishnan et al., 2014)	Cost structure and sticky costs	59

Source: VOSviewer

In second place, there is (Weiss, 2010) who was a pioneer researcher looking at the impact of cost stickiness. Therefore, Weiss's article became an important reference point for researchers examining the effect of sticky cost on the dependent variable. Weiss proposed a sticky model different to that of Anderson et al. (2003), and it is known as Weiss's sticky model.

Next, the authors look at the researchers who were most active in developing cost stickiness studies (**Table 5**). Rajiv D. Banker, as the co-author of the research by Anderson et al. (2003), continued the research on cost stickiness by examining various things related to the topic. Banker and Byzalov (2014), specifically and in detail, reviewed the asymmetry of cost behavior in their article in 2014. In addition, Banker also examined the implications of the existence of cost behavior asymmetry in financial statement analysis (Anderson et al., 2007; Bu et al., 2015), the effect of cost behavior asymmetry related to conservatism (Banker et al., 2016), as well as the dominant factors affecting the asymmetry of cost behavior, including the magnitude of changes in sales (Banker et al., 2014), worker protection rules (Banker et al., 2013), and, most recently, macroeconomic conditions (Banker et al., 2020).

Table 5. Productivity of Cost Stickiness Research Writers

No.	Author	Articles	Citations	Average
1	Rajiv D. Banker	7	641	92
2	Dmitri Byzalov	4	328	82
3	Raj Mashruwala	4	121	30
4	Mustafa Ciftci	4	101	25
5	Dan Weiss	3	243	81

Source: VOSviewer

Finally, the results of the bibliometric analysis show the keywords that are often used by cost stickiness researchers. Bearing in mind that this research discusses cost stickiness, the results from the keywords cost stickiness, sticky cost, and asymmetric cost behavior are not shown in **Table 6**. The keyword most frequently mentioned in the articles is cost management, followed by corporate governance and agency problems. Cost stickiness researchers take the view that sticky behavior occurs as a form of cost management that is influenced by corporate governance and is also related to agency problems.

Table 6. Frequency of Keywords in Cost Stickiness Articles

No.	Keywords	Occurrences	Keywords	No.
1	cost management	7	Humans	8
2	corporate governance	6	Sustainability	9
3	agency problem	6	resource allocation	10
4	firm size	5	cost variability	11
5	manufacturing	4	cost anti-stickiness	12
6	adjustment costs	4	resource adjustment costs	13
7	earnings management	4	optimism	14

Source: VOSviewer

To see the clustering of research on cost stickiness in the last two decades in reputable international journals, VOSviewer presents 11 groups. Based on the observation of keywords in the eleven groups, six main clusters were obtained. The first cluster reviews sticky behavior in the health industry with keywords including ambulatory care facilities, hospitals, health care costs, health economics, occupational health, outpatient departments, patient referrals, referral and consultation (Balakrishnan & Gruca, 2008; West, 2003; West et al., 2002). The second cluster focuses on the sticky behavior of labor costs, in particular with regard to worker protection rules and how these costs behave in companies affiliated with government and politics (Banker et al., 2013; Gu et al., 2020; Kim et al., 2020; Zanella et al., 2015). The keywords in this cluster include employment, employment protection legislation, labor adjustment costs, government, political connection, social stability, reliance on skilled labor, and state-owned enterprises. The third cluster examines sticky cost behavior related to social, environmental and sustainability issues and also reviews the cost behavior of small medium companies (Argilés Bosch & Blandón, 2011; Argilés & García-Blandón, 2009; Habib & Hasan, 2019; Özkaya, 2020; Panwar et al., 2015; Via & Perego, 2014).

The fourth cluster is cost stickiness research related to corporate governance and associated with agency problems, including earnings management, institutional monitoring, empire building, and also related to market pressure, namely stock prices (Chae & Ryu, 2016;

Costa & Habib, 2020; Namitha & Shijin, 2016; Paik & Koo, 2017; Riegler & Weiskirchner-Merten, 2020; Tang et al., 2020). The fifth cluster reviews sticky cost research in the manufacturing businesses including agile manufacturing, inventory control and management, and lean manufacturing (Azeez et al., 2017; Kroes & Manikas, 2018). Finally, the sixth cluster examines the occurrence of sticky costs due to leadership/manager/CEO characteristics related to optimism and overconfidence (Banker et al., 2014; Bu et al., 2015; Ciftci & Zoubi, 2019; Hur et al., 2019; Krisnadewi & Soewarno, 2021; Lai et al., 2021; Li et al., 2020; Lopatta et al., 2020; Yang, 2015).

To determine the trend of cost stickiness research from over time, **Figure 1** shows the results of the VOSviewer overlay analysis. According to this figure, at the beginning of the cost stickiness research (dark blue color), it was carried out in the area of health services, namely reviewing cost management strategies that aim to save costs but are limited by the existence of cost stickiness (Balakrishnan & Gruca, 2008; West, 2003; West et al., 2002). Recent cost stickiness research (in green and yellow) shows areas related to research in the government sector (Bradbury & Scott, 2018; Cohen et al., 2017; Wu et al., 2020), state-owned enterprises (Jiang et al., 2016; Z. Li et al., 2020; Prabowo et al., 2018; Zhong & Gao, 2017) and cost stickiness research in the area of business strategy (Ballas et al., 2020; Lu et al., 2020; Xu & Zheng, 2020). In addition, the latest cost stickiness research also examines the role of CEOs in causing cost stickiness (Khedmati et al., 2019; Lai et al., 2021; Lee et al., 2019; Li et al., 2020; Lopatta et al., 2020).

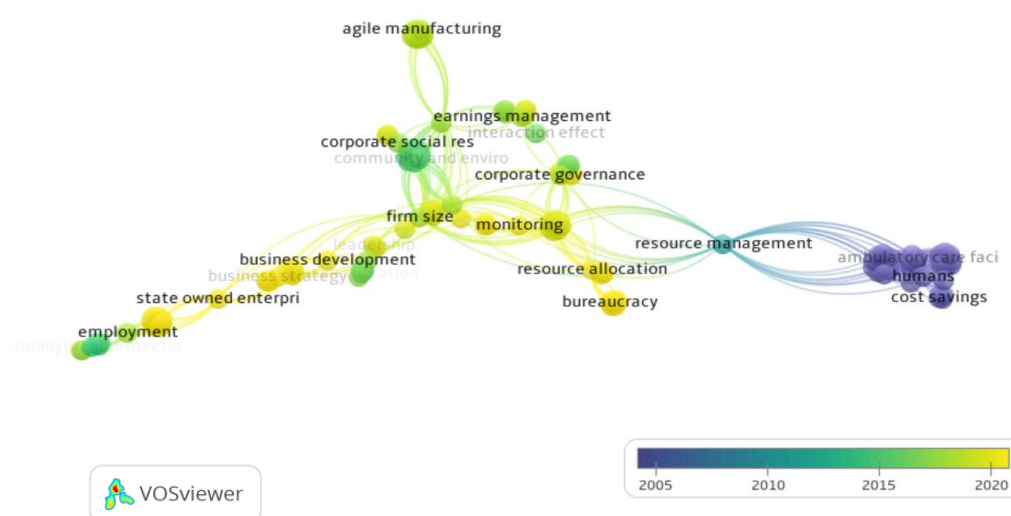


Figure 1. Development of Cost Stickiness Research Over Time

To find what research opportunities there are on the topic of cost stickiness, VOSviewer displays them based on color density. Topics that have low density indicate that there are still few topics discussed, so those topics become opportunities for research in the future. These topics include the role of the environmental community, business strategy, and the role of managers (leadership) as interaction variables which are still opportunity for investigation. In addition, based on the search for the articles used in this study, there are opportunities for future researchers to investigate certain types of costs in certain types of industries. Previous research has mostly tended to examine the manufacturing industry, while

only a small proportion has examined the costs behavior in certain industrial sectors. For example, in the retail industry (Krisnadewi & Soewarno, 2020), agriculture (Argilés & García-Blandón, 2009), banking (Lee et al., 2020), pharmaceuticals (Yoon & Moon, 2015), transportation (Cannon, 2014), food and beverage (Pervan & Pervan, 2012), petroleum (Osmundsen et al., 2010), and hospitals (Balakrishnan and Gruca, 2008).

The authors manually traced the treatment of the cost stickiness variable in previous studies. There are two groups of cost stickiness research related to the types of variables. First, cost stickiness as the dependent variable. In this research group, the researchers tested the factors that influence the occurrence of cost stickiness. Second, cost stickiness as an independent variable, where the researchers want to examine the impact caused by the existence of cost stickiness. In the first group, researchers tend to use the sticky cost model proposed by (Anderson et al., 2003). The basic formula used is as follows.

$$\ln \left[\frac{SGA_{i,t}}{SGA_{i,t-1}} \right] = \beta_0 + \beta_1 \ln \left[\frac{Sales_{i,t}}{Sales_{i,t-1}} \right] + \beta_2 * DD_{i,t} * \ln \left[\frac{Sales_{i,t}}{Sales_{i,t-1}} \right] + \varepsilon_{i,t} \quad (1)$$

Or it can be written as follows (Banker & Byzalov, 2014):

$$\Delta \ln SGA_{i,t} = \beta_0 + \beta_1 \Delta \ln Sales_{i,t} + \beta_2 DD_{i,t} * \Delta \ln Sales_{i,t} + \varepsilon_{i,t} \quad (2)$$

Note:

SGA = Sales, Administration and General Costs

DD = Decrease dummy = dummy change in sales from period t-1 to period t; DD = 1 when there is a decrease in sales; DD = 0 when there is an increase in sales or when sales are fixed.

i = company; t = period of year

β = coefficient

ε = error

Δ = delta = change

In the second group, the researchers used the formula proposed by (Weiss, 2010) as follows:

$$STICKY_{i,t} = \log \left(\frac{\Delta Cost}{\Delta Sale} \right)_{i,\underline{\tau}} - \log \left(\frac{\Delta Cost}{\Delta Sale} \right)_{i,\bar{\tau}} \quad \underline{\tau}, \bar{\tau} \in \{t, \dots, t-3\} \quad (3)$$

Note:

The time period used in the Weiss model is on a quarterly basis. The value of $\underline{\tau}$ shows the last quarter of the four quarters that experienced a decline in sales, while $\bar{\tau}$ shows the opposite, namely an increase in sales. Cost changes are calculated using the formula for sales minus profit before extraordinary items.

In the first research group, it was found that the factors causing cost stickiness could come from the characteristics and incentives of managers. These include managerial incentives to avoid loss and earnings decrease (Chen & Lee, 2019; Kama & Weiss, 2013), managerial optimism (Krisnadewi & Soewarno, 2021), manager overconfidence (Hur et al., 2019; Lai et al., 2021; Yang, 2015), risk preferences (Li et al., 2021; Li et al., 2020), manager incentives for earning management (Xue & Hong, 2016), manager incentives for empire building and other opportunistic actions (Brüggen & Oliver, 2014; Nagasawa & Nagasawa, 2021). The second factor causing cost stickiness is pressure from external parties. This includes political uncertainty (Lee et al., 2020), social community (Hartlieb et al., 2020), competitive pressures (Cheung et al., 2018; Krisnadewi & Soewarno, 2020; Lee et al., 2020; Li & Zheng, 2017), pressure from tax regulations (Xu & Zheng, 2020), regulations on worker

protection and minimum wages (Banker et al., 2013; Jiang et al., 2016), regulations related to certain industries, such as rebate rules (Yoon & Moon, 2015), regulatory change in the insurance industry (Belina et al., 2019), CSR (Habib & Hasan, 2019). The next factor is related to corporate governance, including the structure of CEO management (Lee et al., 2019), and company ownership (Chae & Ryu, 2016; Chung et al., 2019; Gu et al., 2020). The next factor is related to the internal conditions of the company. For example, company strategy (Ballas et al., 2020; Zhong et al., 2020), trade credit (Costa & Habib, 2020), total investment in R&D (Ko et al., 2020), operating leases (Cook et al., 2019), retirement plans (Kuiate & Noland, 2019), use of assets (Mohammadi & Taherkhani, 2017; Venieris et al., 2015; Zhang et al., 2019), and internal control (Chae & Chung, 2015; Kim et al., 2019).

Unlike the first group, the second group, namely research that examines cost stickiness as an independent variable, presents major opportunities for research in the future. According to the search, only 12 articles reviewed this. Previous research examined the effect of cost stickiness on company policy, for example, dividend policy (He et al., 2020), R&D investment (Sun et al., 2019), earnings management (Da Silva et al., 2019). Furthermore, the effect of cost stickiness on financial reporting (Hashed, 2020; Salehi et al., 2018), on company and market performance (Lopatta et al., 2020; Tang et al., 2020; Weiss, 2010), and finally, the effect on auditing price (J. H. Kim, 2019b) and audit report lag (J. H. Kim, 2019a).

CONCLUSION

This paper aims to find out about the development of cost stickiness research in reputable international journals. Using the Scopus database, the results show that the interest in researching cost stickiness is increasing, so the opportunities for research into this topic are still numerous. The most active author of articles on cost stickiness is Rajiv D. Banker, while articles that are always referred to are the pioneering writings of Anderson et al. 2003. Apart from these, there is also a 2010 article by Weiss. Judging from the treatment of the cost stickiness variable, there are two main groups identified by this research. The first group of studies examines the factors that cause the occurrence of cost stickiness. Second, there are studies that examine the impact of cost stickiness, which was pioneered by Weiss. Judging from the limited number of articles, the opportunities for research on the topic tackled by the second group appear to be greater than the first. Even so, researchers' interest in exploring the causes of cost stickiness is still high. The causes of cost stickiness, which have still only been researched to a limited extent, are related to the role of the environmental community, business strategy, and the role of managers (leadership).

This paper has limitations because it only uses the Scopus database in order to retrieve data about articles. The lack of access to other databases, such as the Web of Science, is the main reason for this limitation. Future researchers could consider using another database if they want to find out about the development of cost stickiness research more comprehensively. The results of this paper are expected to provide assistance to researchers, especially students, in recognizing the patterns of research into cost stickiness that have existed for the last two decades.

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