

# Cost stickiness: a bibliometric analysis with future research agenda

Stephan Klaus Bubeck

Universidade Regional de Blumenau - FURB, Brasil

## **Cost stickiness: un análisis bibliométrico con agenda para futuras investigaciones**

Tras la publicación del estudio seminal de Anderson et al. (2003), han surgido varios estudios sobre el comportamiento asimétrico de los costos, también llamado *cost stickiness*. Así, el presente estudio tuvo como objetivo realizar un análisis bibliométrico de la producción científica sobre *cost stickiness*, considerando las publicaciones indexadas en la plataforma Scopus entre los años 2003 y 2023. El proceso de filtrado de la producción científica se produjo por tipo de documento, fuente, idioma, área de estudio y tema, lo que resultó en 213 artículos sobre *cost stickiness*. El análisis bibliométrico se realizó con la ayuda del software Bibliometrix. Los principales resultados indican un aumento significativo de las publicaciones sobre el tema a partir de la década de 2010, siendo Estados Unidos, China y Corea del Sur los países más productivos. Además, autores como Rajiv Banker y revistas como el *Journal of Management Accounting Research* destacan tanto en número de publicaciones como en citas. Este estudio sirve como punto de partida para los investigadores interesados en profundizar en la literatura sobre *cost stickiness*, además de proporcionar sugerencias para futuras investigaciones sobre el tema.

**Palabras clave:** bibliometría, *cost stickiness*, comportamiento asimétrico de los costos, Scopus

## **Cost stickiness: a bibliometric analysis with future research agenda**

After the publication of the seminal study by Anderson et al. (2003), several studies have emerged about asymmetric cost behavior, also called *cost stickiness*. Thus, the present study aimed to carry out a bibliometric analysis of the scientific production on *cost stickiness*, considering the



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publications indexed on the Scopus platform between the years 2003 and 2023. The process of filtering the scientific production occurred by type of document, source, language, area of study and theme, which resulted in 213 articles on cost stickiness. Bibliometric analysis was performed with the aid of the Bibliometrix software. The main results indicate a significant increase in publications on the subject from the 2010s onwards, with the United States, China and South Korea being the most productive countries. In addition, authors such as Rajiv Banker and journals such as the *Journal of Management Accounting Research* stand out both in number of publications and citations. This study serves as a starting point for researchers interested in delving deeper into the literature on cost stickiness, in addition to providing suggestions for future research on the subject.

**Keywords:** bibliometrics, cost stickiness, asymmetric cost behavior, Scopus

### **Cost stickiness: uma análise bibliométrica com agenda para pesquisas futuras**

A partir da publicação do estudo seminal de Anderson et al. (2003) surgiram diversas pesquisas acerca do comportamento assimétrico dos custos, também chamado de *cost stickiness*. Desse modo, o presente estudo teve como objetivo realizar uma análise bibliométrica da produção científica sobre *cost stickiness*, considerando as publicações indexadas na plataforma Scopus entre os anos de 2003 e 2023. O processo de filtragem da produção científica ocorreu por tipo de documento, fonte, idioma, área de estudo e tema, o qual resultou em 213 artigos sobre *cost stickiness*. A análise bibliométrica foi realizada com o auxílio do software Bibliometrix. Os principais resultados indicam um aumento significativo nas publicações sobre o tema a partir da década de 2010, com os Estados Unidos, China e Coreia do Sul sendo os países mais produtivos. Além disso, autores como Rajiv Banker e periódicos como o *Journal of Management Accounting Research* se destacam tanto em número de publicações quanto em citações. Este estudo auxilia como um ponto de partida para pesquisadores com interesse em se aprofundarem na literatura sobre *cost stickiness*, além de fornecer sugestões de pesquisas futuras sobre o tema.

**Palavras-chave:** bibliometria, *cost stickiness*, comportamento assimétrico dos custos, Scopus

## **1. INTRODUCTION**

The traditional cost allocation model considers that costs are divided into fixed and variable in relation to changes in the volume of activities (Richartz & Borgert, 2021). However, the literature provides evidence that costs do not necessarily behave in a linear manner (Anderson et al., 2003; Weiss, 2010). The study by Anderson et al. (2003) was the first to provide robust statistical evidence that costs behave asymmetrically, based on an empirical model developed by the authors. Through this research, it was

shown that costs increase more when there is an increase in sales than they reduce when sales decrease. This asymmetry was called by the authors as sticky costs.

Balakrishnan et al. (2004) identified the asymmetric behavior in the opposite way to sticky costs, which was later called anti-sticky costs by Weiss (2010), in which costs increase to a lesser extent for increases in revenue than they reduce when revenue falls in the same proportion. Thus, cost stickiness, a term used in the literature to refer to the asymmetric behavior of costs, encompasses two possibilities: sticky cost and anti-sticky cost (Ibrahim et al., 2022).

After the confirmation of the occurrence of asymmetric cost behavior by Anderson et al. (2003), several studies on cost stickiness in different contexts emerged (Aguirre-Quezada et al., 2023; Argilés-Bosch et al., 2023; Bubeck & Hein, 2024; Costa & Opore, 2022; Fabre & Borgert, 2022; Le et al., 2022; Li et al., 2021; Qing, 2023; Subramaniam & Watson, 2016). Thus, it is relevant to carry out a bibliometric analysis on the subject, to provide a global view of the development of the literature, in addition to identifying trends and gaps to be explored in future studies (Donthu et al., 2021).

In view of the above, the present study aims to carry out a bibliometric analysis of the scientific production on cost stickiness, considering the publications indexed in the Scopus platform between the years 2003 and 2023. Based on the proposed objective, this study seeks to answer the following research questions: (1) what are the main authors, countries, journals, and articles that contribute to the literature on cost stickiness? and (2) what are the main gaps in the literature on cost stickiness that can be explored in future studies?

The choice of period of analysis is justified by the publication, in 2003, of the seminal study by Anderson et al. (2003), which gave rise to a vast literature on asymmetric cost behavior. Thus, the time frame adopted in this study covers the development trajectory of this theme. Scopus was selected as the database for this study due to its wide coverage of scientific publications and the rigor of its indexing criteria, which guarantee the reliability of the data used (Baas et al., 2020). Scopus is also widely recommended for bibliometric reviews, being recognized for its comprehensiveness and quality of metadata, which enables a more accurate analysis of trends and patterns in the literature than other databases (Donthu et al., 2021; Kumar et al., 2021).

This study contributes by providing an overview of the research on cost stickiness that emerged from the seminal study by Anderson et al. (2003). For this, information such as the identification of the main authors, countries, journals and articles was presented. This study also contributes by presenting suggestions for future research that can be explored on the subject. Thus, this study helps as a starting point for

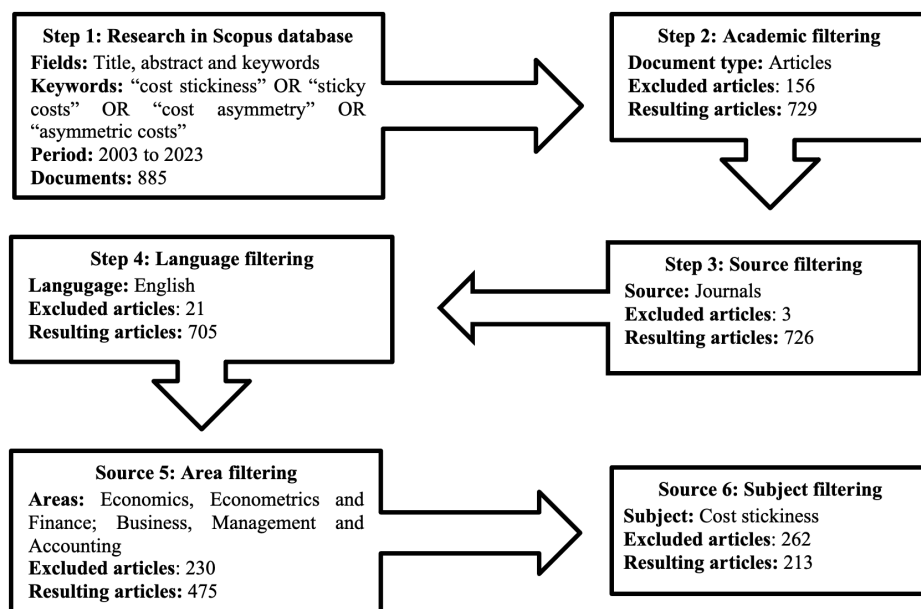
researchers who are interested in delving deeper into the literature on cost stickiness, thus stimulating the production of new works that can strengthen the understanding of the subject. In addition, mapping the literature on asymmetric cost behavior can help managers and accounting professionals better understand the factors that influence cost asymmetry, based on the most relevant articles on this subject, allowing for more informed decisions about the company's cost structure.

## 2. METHODOLOGICAL PROCEDURES

The search strategy for the articles included in the bibliometric analysis consisted of six stages, as shown in figure 1: database search, academic filtering, source filtering, language filtering, area filtering, and theme filtering. Step 1 refers to database search. As explained in the Introduction, the Scopus database was used in this study.

For the initial selection of studies, the terms “cost stickiness”, “sticky costs”, “cost asymmetry” and “asymmetric costs” were used in the search fields title, abstract and keyword. For the article search period, the interval from 2003 to 2023 was used. Thus, the initial research resulted in 885 works.

**Figure 1.** Search and filtering strategy for bibliometric analysis



*Note.* Adapted of What do we know about transfer pricing? Insights from bibliometric analysis, from S. Kumar, N. Pandey, W. M. Lim, A. N. Chatterjee, & N. Pandey, 2021, *Journal of Business Research*, 134, p. 277 (<https://doi.org/10.1016/j.jbusres.2021.05.041>).

Step 2 consists of academic filtering. Only articles were considered, as they usually report more current topics than other types of documents. Thus, other types of documents were not included, such as books and book chapters, for example. Academic filtering excluded 156 papers, resulting in 729 papers.

Step 3 refers to source filtering. It was decided to consider only articles published in journals available in the Scopus database, as these are generally submitted to a more rigorous review process than articles from other sources (Kumar et al., 2021). Thus, articles from conference proceedings were not considered in the sample, as well as other articles that have not been published in journals. By filtering the source, 3 articles were excluded, which resulted in 726 articles.

Step 4 comprises language filtering. Only articles written in English were considered, because it is impractical to work with translations with large data sets. Thus, 21 articles were excluded, resulting in 705 articles.

Step 5 is about area filtering. Due to the theme, only articles from the following areas were considered: (i) economics, econometrics and finance and (ii) business, management and accounting. Filtering by area excluded 230 articles, resulting in 475 articles.

Finally, step 6 refers to the theme filtering. Based on the reading of the title and abstract of the articles, 262 articles that were not related to the topic of cost stickiness were excluded, resulting in a final sample of 213 articles.

For operationalization purposes, the bibliographic data of the 213 scientific articles resulting from the filtering process were exported from the Scopus database in CSV format, and later imported into the RStudio Bibliometrix software. Bibliometrix was used because it is one of the most complete research tools related to bibliometrics, with an intuitive interface, in addition to a wide range of functionalities, analyses and graphs (Aria & Cuccurullo, 2017).

### 3. PRESENTATION AND DISCUSSION OF RESULTS

#### 3.1. Database overview

Table 1 presents the general information about the database of the bibliometric study on cost stickiness.

**Table 1.** General information about the database

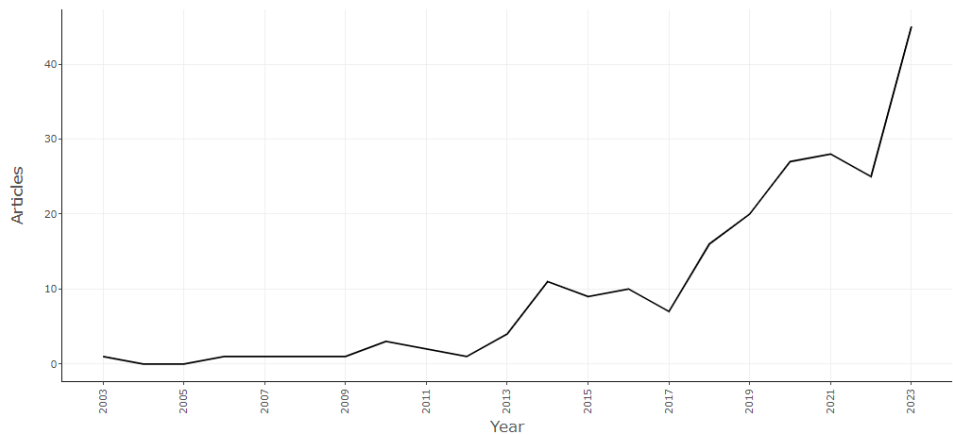
Key data insights	
Period	2003-2023
Journals	107
Articles	213
Average publications per year	4,76
Average citations per article	23,40
Author's keywords	551
Authors	
Authors	432
Authors of single-authored articles	19
Authors of multi-authored articles	413
Author collaborations	
Single-authored articles	24
Multi-authored articles	189
Articles by author	0,49
Authors per article	2,03
Collaboration index	2,19

Note. From Scopus, from Elsevier, 2024 (<https://www.scopus.com>).

In the period from 2003 to 2023, there are 213 scientific articles in the Scopus database, published in 107 different journals, with an average of 4,76 publications per year. In the period analyzed, the published articles refer to 432 authors in all, 19 of whom are authors of single-authored articles and 413 are authors of multi-authored articles. Of the 213 articles published, 24 are single-authored articles and 189 are multi-authored articles. Articles have an average of two authors per publication. The collaboration index, calculated as the total number of authors of multi-authored articles (413) divided by the total number of multi-authored articles (189), is 2,19.

Figure 2 shows the distribution of the 213 publications indexed in Scopus related to cost stickiness, in the period from 2003 to 2023. Analyzing the annual scientific production, the year with the highest number of publications was 2023, with 45 articles, comprising 21% of the total publications. In second place is the year 2021, with 28 publications, representing 13% of the total.

**Figure 2.** Annual scientific production



Source: prepared by the authors using the Bibliometrix software.

In the 2000s, there were only 5 articles on cost stickiness (2% of the total sample), among which is the seminal article by Anderson et al. (2003). There was an increase in publications on cost stickiness in the 2010s, with 83 articles, which referred to 39% of the total. The 2020s, which in this study covers the years 2020 to 2023, have 125 articles, which total 59% of the sample. Thus, there is an increasing trend of publications on cost stickiness, since the 2020s, with only four years, have more than half of the articles in the sample.

**3.2. Most relevant authors**

Table 2 shows the most relevant authors regarding publications on cost stickiness according to the number of publications. Authors who have at least four publications, which comprise a total of twelve authors, are presented. The number of single-authored articles and articles with the participation of other authors is demonstrated, as well as the number of publications in which the researcher is the first author in relation to articles prepared in collaboration with other authors.

**Table 2.** *Most relevant authors based on the number of publications*

Authors	Country	Articles	Single author	Multi-authorship	First author
Rajiv Banker	United States	8	0	8	5
Ahsan Habib	Australia	6	0	6	3
Vasilios-Christos Naoum	Greece	6	0	6	1
Mabel D'Costa	New Zealand	5	0	5	4
Sven Hartlieb	Germany	5	1	4	3
Kenneth Zheng	United States	5	0	5	0
Joseph Árgiles-Bosch	Spain	4	0	4	4
Dmitri Byzalov	United Arab Emirates	4	0	4	0
Mustafa Ciftci	United Arab Emirates	4	0	4	3
Thomas Loy	Germany	4	0	4	1
Raj Mashruwala	Canada	4	0	4	0
Daecheon Yang	South Korea	4	1	3	2

*Note.* From Scopus, from Elsevier, 2024 (<https://www.scopus.com>).

It was verified that only two articles refer to publications of single authorship, which demonstrates that research on cost stickiness is usually elaborated in authorship partnerships. In addition, it is observed that, among the twelve authors with the most publications, there is a variety of authors' countries. In terms of scientific productivity and relevance to the literature on cost stickiness, researcher Rajiv Banker stands out. In addition to being a co-author on the seminal paper by Anderson et al. (2003), Rajiv Banker has also participated in seven other papers on cost stickiness, being the first author on five of them.

Table 3 presents the ten most relevant authors according to the number of citations. In addition, the number of published articles of single authorship and multi-authored articles was identified, as well as the number of articles in which the researcher is the first author.

It is noteworthy that the three most cited authors are the authors of the seminal article by Anderson et al. (2003), which demonstrates the relevance of this study for the literature on cost stickiness. Compared to table 2, which shows the twelve authors with the most publications, only researchers Rajiv Banker, Dmitri Byzalov, Raj Mashruwala and Musataf Ciftci also appear among the ten most cited authors. Regarding the coun-



tries of the researchers, it is observed that half of the most cited authors are from the United States. It is also verified that only two authors have articles of single authorship.

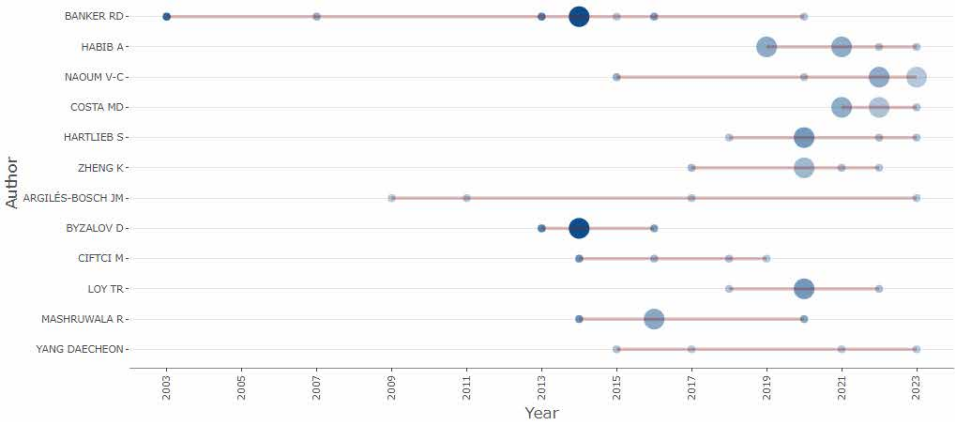
**Table 3.** *Most relevant authors based on the number of citations*

Authors	Country	Citations	Articles	Single Author	Multi-Authorship	First Author
Rajiv Banker	United States	1.488	8	0	8	5
Mark Anderson	United States	764	3	0	3	3
Surya Janakiraman	United States	749	3	1	2	0
Dmitri Byzalov	United Arab Emirates	724	4	0	4	0
Dan Weiss	Israel	500	3	1	2	0
Raj Mashruwala	Canada	306	4	0	4	0
Itay Kama	Israel	258	2	0	2	1
Lei Chen	United States	243	1	0	1	0
Ramji Balakrishnan	United States	233	2	0	2	2
Mustafa Ciftci	United Arab Emirates	227	4	0	4	3

*Note.* From Scopus, from Elsevier, 2024 (<https://www.scopus.com>).

Figure 3 shows the publication flow of the twelve authors with the most publications on cost stickiness.

**Figure 3.** *Publication flow of the most productive authors*



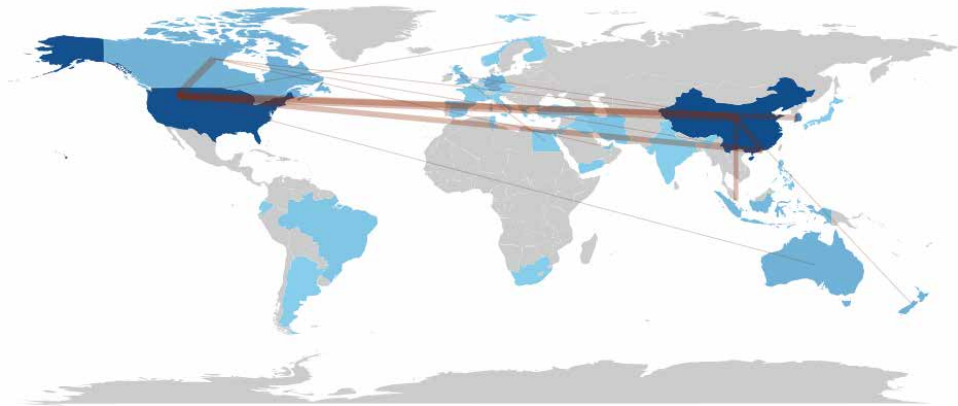
*Note.* Prepared by the authors using the Bibliometrix software.

Authors with larger circles, such as Rajiv Banker, have a greater number of publications on the subject, standing out as the most productive. In addition, authors with more intense circles of color are those whose research has had the greatest academic impact in terms of citations. Rajiv Banker, for example, has not only the highest number of publications (8), but also the highest measured impact on citations (1.488), evidencing its continued relevance in research on asymmetric cost behavior. Thus, for researchers who are interested in delving into the literature on cost stickiness, it is essential to read this researcher's studies on this topic: Anderson et al. (2003), Anderson et al. (2007), Banker et al. (2016), Banker and Byzalov (2014), Banker et al. (2013), Banker et al. (2014), Banker et al. (2020) and Bu et al. (2015).

### 3.3. World scientific production

In figure 4, which shows the world's scientific production on cost stickiness, the territories with the most intense blue tones are responsible for the largest publication records, while the lines indicate collaboration between different countries.

**Figure 4.** *Global scientific production and collaboration between countries*



*Note.* Prepared by the authors using the Bibliometrix software.

Publications on cost stickiness are widespread in different countries around the world. The largest number of publications is concentrated in China (38), South Korea (29) and the United States (24), which exhibit a more intense blue color in figure 2. Regarding the total number of citations by country, the United States appears in first place, with 706 citations. In second place is China, with 287 citations, followed by Australia (231), the United Kingdom (207), South Korea (135), Germany (122) and New Zealand (109). The largest collaboration between countries occurred between the United States and China (10), and the second was between the United States and Canada (7).

The demonstration of the most relevant countries on cost stickiness highlights research gaps by identifying countries where there is little or no research on cost stickiness. In this sense, the absence of scientific articles in Russia, in most countries on the African continent and in South America, except for Brazil, Argentina and Ecuador, is noteworthy.

3.4. Most relevant journals

Table 4 presents in Panel A the ten most relevant journals based on the number of publications on cost stickiness. In Panel B, the most relevant journals are presented based on the number of citations. The SCimago Journal Rank (SJR) is presented, which is a metric that evaluates the importance of scientific journals based on the citation of their articles. Thus, the higher the SJR, the greater the relevance of the journal.

Table 4. Most relevant journals

Panel A - Most relevant journals by number of publications				
Journal	Country	SJR	Articles	Citations
<i>Journal of Management Accounting Research</i>	United States	0,73	15	649
<i>Accounting and Finance</i>	United States	0,82	10	155
<i>Finance Research Letters</i>	Netherlands	1,90	9	113
<i>Journal of Management Control</i>	Germany	0,83	7	92
<i>Academy of Accounting and Financial Studies Journal</i>	United States	-	6	19
<i>China Journal of Accounting Studies</i>	United Kingdom	0,23	6	30
<i>Applied Economics</i>	United Kingdom	0,59	5	42
<i>Asia-Pacific Journal of Accounting and Economics</i>	United Kingdom	0,32	5	53
<i>Contemporary Accounting Research</i>	United States	3,09	5	250
<i>European Accounting Review</i>	United Kingdom	1,26	5	101
Total			73	1.504
Panel B - Most relevant journals by number of citations				
Journal	Country	SJR	Citations	Articles
<i>Journal of Accounting Research</i>	United Kingdom	6,63	877	3
<i>Journal of Management Accounting Research</i>	United States	0,73	649	15

<i>The Accounting Review</i>	United States	4,64	525	3
<i>Management Accounting Research</i>	United States	1,28	378	5
<i>Journal of Accounting and Economics</i>	Netherlands	8,34	345	2
<i>Contemporary Accounting Research</i>	United States	3,09	250	5
<i>Journal of Accounting, Auditing and Finance</i>	United States	0,85	168	3
<i>Accounting and Finance</i>	United States	0,82	155	10
<i>Journal of Corporate Finance</i>	Netherlands	3,18	141	4
<i>Finance Research Letters</i>	Netherlands	1,90	113	9
<b>Total</b>			<b>3.601</b>	<b>59</b>

Note. From Scopus, from Elsevier, 2024 (<https://www.scopus.com>).

The 213 articles on cost stickiness from the Scopus database were published in 107 different journals. Among these, the *Journal of Management Accounting Research* is the one with the largest number of publications (15). In addition, this journal was the second in number of citations (649). The scope of this journal is to publish works that promote the theory and practice of management accounting (American Accounting Association, 2024).

In first place in the number of citations was the *Journal of Accounting Research*, with 977 citations referring to 3 articles, one of which refers to the study by Anderson et al. (2003). The scope of this journal comprises research in all areas of accounting and related fields that use tools from basic disciplines such as economics, statistics, psychology, and sociology (Wiley, 2025).

*Journal of Management Accounting Research*, *Accounting and Finance*, *Finance Research Letters* and *Contemporary Accounting Research* have a relevant number of both publications and citations, demonstrating that the articles published in these journals generally have high academic relevance to the literature on cost stickiness. On the other hand, the *Academy of Accounting and Financial Studies Journal*, despite being the fifth journal with the most publications (6), has only 19 citations, in addition to being the only journal in table 4 that does not have SJR, which may demonstrate that the publications of this journal may not have the academic quality at the level of the journals mentioned above.

3.5. Most relevant articles

Table 5 shows the ten most relevant articles in the sample selected for this study, based on the number of citations, with their authors and corresponding journals. The SJR of the journals of the most cited articles is also presented.

Table 5. Most relevant articles by number of citations

Title	Authors	Journal	SJR	Citations
“Are selling, general and administrative costs “sticky”?”	Anderson et al. (2003)	<i>Journal of Accounting Research</i>	6,63	614
“Employment protection legislation, adjustment costs and cross-country differences in cost behavior”	Banker et al. (2013)	<i>Journal of Accounting and Economics</i>	8,34	243
“Cost behavior and analysts’ earnings forecasts”	Weiss (2010)	<i>The Accounting Review</i>	4,64	240
“Do earnings targets and managerial incentives affect sticky costs?”	Kama and Weiss (2013)	<i>Journal of Accounting Research</i>	6,63	226
“Do managerial incentives drive cost behavior? Evidence about the role of the zero earnings benchmark for labor cost behavior in private Belgian firms”	Dierynck et al. (2012)	<i>The Accounting Review</i>	4,64	209
“Asymmetric cost behavior”	Banker and Byzalov (2014)	<i>Journal of Management Accounting Research</i>	0,73	205
“The moderating effect of prior sales changes on asymmetric cost behavior”	Banker et al. (2014)	<i>Journal of Management Accounting Research</i>	0,73	174
“A note on cost stickiness: Some international comparisons”	Calleja et al. (2006)	<i>Management Accounting Research</i>	1,28	163
“Cost behavior and fundamental analysis of SG&A costs”	Anderson et al. (2007)	<i>Journal of Accounting, Auditing &amp; Finance</i>	0,85	133
“Cost stickiness and core competency: A note”	Balakrishnan and Gruca (2008)	<i>Contemporary Accounting Research</i>	3,09	129
Total				2.336

Note. From Scopus, from Elsevier, 2024 (<https://www.scopus.com>).

The most cited article on cost stickiness is “Are sales, general and administrative costs “sticky”?” of Anderson et al. (2003), being the first to present robust statistical evidence about the asymmetric behavior of costs, through an empirical model developed by the authors. Based on a sample of 7.629 companies of USA from 1979 to 1998, Anderson et al. (2003) examined the asymmetric behavior of selling, general and administrative expense accounts, exploring different determinants that could affect it, such as economic growth, asset intensity and employee intensity.

The results of the study by Anderson et al. (2003) indicated that, on average, costs increase by 0,55% in response to a 1% increase in net sales revenue, but that it decreases by only 0,35% in relation to a decrease in the same proportion in sales. This asymmetric behavior in which costs increase more for increases in sales than they reduce in relation to decreases in sales was called sticky costs by the authors. Equation 1 presents the model proposed by Anderson et al. (2003) for the identification of asymmetric cost behavior, which is widely used in the literature on cost stickiness in different contexts (Ibrahim et al., 2022).

*Equation 1*

$$\log \left\{ \frac{Costs_{i,t}}{Costs_{i,t-1}} \right\} = \beta_0 + \beta_1 \log \left\{ \frac{NSR_{i,t}}{NSR_{i,t-1}} \right\} + \beta_2 dNSR * \log \left\{ \frac{NSR_{i,t}}{NSR_{i,t-1}} \right\} + \varepsilon_{i,t}$$

Where:

log = logarithm;

NSR = Net sales revenue;

dNSR = Dichotomous variable of decreased NSR;

$\varepsilon$  = Regression error.

In the model of Anderson et al. (2003), the dichotomous variable assumes the value of 1 when the NSR of company *i* in period *t* is lower than the NSR of period *t*-1 and 0 (zero), otherwise. When the dichotomous variable is 0 because of increases in NSR, the  $\beta_1$  coefficient measures the percentage increase in costs compared to the increase in NSR of 1%. When the dichotomous variable is 1 because of reductions in NSR, the sum of the coefficients  $\beta_1$  and  $\beta_2$  demonstrates the percentage of reduction in costs in relation to the 1% decrease in NSR.

For costs to present asymmetric sticky cost behavior, the increase in costs in relation to a 1% increase in NSR must be greater than the reduction in costs in relation to the 1% reduction in NSR, that is, the coefficient  $\beta_1$  must be greater than the sum of the coefficients  $\beta_1$  and  $\beta_2$ . Costs will be considered with anti-sticky asymmetric behavior when the reduction in costs relative to the 1% reduction in NSR is greater than the

increase in costs relative to the 1% increase in NSR, i.e. the sum of the  $\beta_1$  and  $\beta_2$  coefficients must be greater than the  $\beta_1$  coefficient.

The second most cited article is “Employment protection legislation, adjustment costs and cross-country differences in cost behavior” of Banker et al. (2013). This study examined the relationship between sticky cost behavior and employment protection legislation (EPL) in 19 OECD countries from 1990 to 2008. In this sense, the research tests the central hypothesis of sticky cost economics: that managers make deliberate choices to hold resources (such as labor) in periods of declining sales to avoid adjustment costs, such as layoffs. The results show that the greater the strictness of EPL, the greater the stickiness of cost behavior, which supports the economic theory of sticky costs. The study contributes to the literature by demonstrating that national institutional factors, such as labor legislation, significantly influence the cost behavior.

In the third place, the article “Cost behavior and analysts’ earnings forecast”, of Weiss (2010), investigated how analyst earnings forecast accuracy, analysts’ selection of covered firms, and market reaction to earnings announcements are affected by firms’ cost behavior in companies of USA from the period of 1986 to 2005. Weiss (2010) finds that firms with sticky costs have less accurate earnings forecasts, lower analyst coverage, and weaker market responses to earnings surprises. This is because sticky costs reduce adjustments in spending when sales fall, increasing earnings variability and making forecasting more difficult.

Weiss (2010) proposes a new metric for cost stickiness, as demonstrated in equation 2. This model calculates the degree of stickiness based on the difference between the ratio of cost variation over sales variation in periods of decline and increase in revenues. The metric, called STICKY, is built based on the last four quarters, choosing the most recent quarters with an increase and a decrease in sales. A negative value of STICKY indicates sticky cost behavior, while a positive value indicates anti-sticky cost behavior.

Equation 2

$$STICKY_{i,t} = \log \left\{ \frac{\Delta COST}{\Delta NSR} \right\}_{i,t (dec)} - \log \left\{ \frac{\Delta COST}{\Delta NSR} \right\}_{i,t (inc)}$$

Where:

log = logarithm;

NSR = Net sales revenue;

dec = the most recent of the last four quarters with a decrease in NSR;

inc = the most recent of the last four quarters with an increase in NSR.

While the model of Anderson et al. (2003) requires long time series to perform reliable regressions, the model of Weiss (2010) is more practical for companies with fewer historical observations, as it uses only the most recent quarters with increase and decrease in sales. Both models are complementary and have been widely used in literature of cost stickiness.

Fourthly, the article “Do earnings targets and managerial incentives affect sticky costs?” by Kama and Weiss (2013) investigates how managerial incentives to achieve profit targets influence the asymmetric cost behavior. The authors show that managers can deliberately and opportunistically adjust resources to achieve profit targets. The results indicate that such incentives significantly reduce cost stickiness, as managers accelerate resource cuts even in the face of temporary declines in sales. The study reinforces the importance of considering the underlying reasons for managerial decisions, highlighting that cost behavior is influenced by agency problems and that asymmetry can be either increased or reduced, depending on the manager’s objectives. Thus, the research contributes to the literature by integrating management accounting (cost structure) with financial accounting (earnings management) themes.

The fifth most cited article is “Do managerial incentives drive cost behavior? Evidence about the role of the zero earnings benchmark for labor cost behavior in private Belgian firms” by Dierynck et al. (2012). The authors investigate whether managerial incentives to achieve the zero-profit target influence the behavior of labor costs in private Belgian firms from 1995 to 2006. The study is based on the premise that, in environments where avoiding losses brings concrete benefits, such as bonus payments, managers have incentives to adjust costs in a more symmetrical manner. The authors show that firms reporting profits close to zero tend to have less asymmetry in labor costs, cutting costs more quickly when sales fall and increasing them more cautiously when sales rise. The study contributes to the literature by providing evidence that outcome-specific incentives directly influence cost behavior, especially in relation to labor costs.

In sixth place, the article “Asymmetric cost behavior” by Banker and Byzalov (2014) provides a comprehensive synthesis of the literature on asymmetric cost behavior. The authors argue that costs are a consequence of managerial decisions and resource adjustment costs, which generate different patterns of behavior: fixed, variable, sticky, and anti-sticky costs. The article also revisits empirical models, responds to methodological criticisms of previous studies, and presents new global evidence using Global Compustat data, demonstrating that asymmetric cost behavior is a recurrent phenomenon in several countries and contexts.



The seventh most cited article is “The moderating effect of prior sales changes on asymmetric cost behavior” by Banker et al. (2014), which analyzed USA companies from the period of 1979 to 2009. This study introduces the idea that the direction of change in sales in the previous period directly influences the behavior of costs in the current period. The authors demonstrate that, while costs tend to be sticky after a prior increase in sales, they become anti-sticky after a prior decrease in sales. This conditional asymmetry is explained by two main mechanisms: (i) the number of idle resources remaining from previous periods and (ii) managerial expectations about future sales, which influence managers’ willingness to retain or adjust resources. The paper proposes a new two-period empirical model that separates these two forces, providing a richer understanding of cost behavior. The empirical results show that when prior sales increase, Sales, General and Administrative (SG&A) costs show significant sticky cost behavior, but in the case of prior sales decrease, SG&A costs show significant anti-sticky behavior. The study contributes significantly to the literature by showing that the traditional sticky cost model, such as that of Anderson et al. (2003), can mask important patterns when it does not consider the influence of sales history.

In eighth place, the article “A note on cost stickiness: Some international comparisons”, by Calleja et al. (2006), investigates the asymmetric behavior of operating costs in companies listed in the United States, United Kingdom, France and Germany, in the period from 1988 to 2004. The study reveals that the stickiness is significantly greater in French and German companies. The authors attribute this to differences in corporate governance systems: while in the United States and the United Kingdom there is greater pressure from shareholders and the capital market, in France and Germany systems oriented to multiple stakeholders predominate, with greater employment protection and less pressure for short-term performance. Furthermore, the results indicate that stickiness tends to decrease over longer time horizons or when there are severe declines in revenues, and that firm-specific factors (such as asset, employee and working capital intensity) and industry-specific factors also influence this behavior. The study contributes by showing that cost behavior is not universal, but depends on the institutional, industry and structural context of the companies.

In ninth place, the article “Cost behavior and fundamental analysis of SG&A costs” by Anderson et al. (2007) investigates how asymmetric cost behavior influences the traditional interpretation of the ratio of SG&A expenses to revenue in fundamental analyses. American companies were analyzed from 1983 to 2002. Common practice assumes that SG&A should vary proportionally to revenue, so that an increase in the SG&A/sales ratio is seen as a signal of managerial inefficiency and future reduction

in profits. However, the authors demonstrate that both fixity and stickiness of costs can increase this ratio even without indicating inefficiency, especially when revenues fall. Using an earnings forecasting model, they show that an increase in the SG&A/sales ratio in periods of declining revenues is positively associated with future profits, suggesting that this signal may reflect optimistic expectations of managers regarding demand recovery.

Finally, the tenth most cited article, “Cost stickiness and core competency: A note”, by Balakrishnan and Gruca (2008), investigates whether cost stickiness varies within the same organization. Using data from hospitals in Ontario (Canada) from the period of 1986 to 1989, the authors apply the model by Anderson et al. (2003) to measure the stickiness of operating costs and demonstrate that costs related to direct patient care (the core of the hospital mission) present a significantly higher degree of stickiness than those related to auxiliary or support services. This difference is attributed to higher adjustment costs (layoffs, replacements, training) and greater uncertainty involved in core activities. The study is a pioneer in showing that cost asymmetry varies not only between firms, but also within firms, depending on the strategic nature of the activities, contributing to the understanding of the relationship between cost behavior, organizational competencies and management decisions.

Among the ten articles with the highest number of citations, four are from the 2000s and six from the 2010s. In general, these studies have contributed to the expansion of the literature on cost stickiness, addressing the asymmetric behavior of costs in different contexts, such as EPL (Banker et al., 2013), analysts’ earnings forecasts (Weiss, 2010), and managerial incentives (Dierynck et al., 2012; Kama & Weiss, 2013).

### **3.6. Future research agenda on cost stickiness**

The literature on cost stickiness has expanded considerably since the seminal study by Anderson et al. (2003). However, several gaps remain, offering opportunities for future studies. Thus, this section presents suggestions for future research that can deepen the understanding of the cost stickiness phenomenon.

- (1) Digitalization and the increasing use of technologies such as artificial intelligence (AI), automation, and big data are reshaping business processes and supply chains. There is a lack of studies exploring how digital transformation, including process automation, impacts the ability to react to market fluctuations in terms of costs. In this way, future research can investigate the impact of using AI tools on companies’ ability to adjust their operating costs. Studies can focus on companies that have adopted process automa-

- tion systems and analyze whether there is a smaller or greater asymmetry in costs, compared to companies that have not adopted these technologies.
- (2) The existing literature focuses mainly on internal factors, such as corporate governance and managerial decisions. Few studies, such as those by Banker et al. (2020) and Tarkom and Yang (2023), have investigated the relationship between external economic factors and asymmetric cost behavior. This area offers ample opportunities to explore how companies in different regions and industries adjust their costs. Thus, it is suggested that future studies analyze how periods of high inflation affect the asymmetric behavior of costs in companies in different sectors. A comparative study between countries with different levels of inflation can also reveal insights into the variations of cost management strategies in different macroeconomic contexts.
  - (3) With the increase in awareness of environmental and social issues, many companies are adopting Environmental, Social and Governance (ESG) strategies. However, the literature has not yet sufficiently explored whether these firms, when attempting to adhere to sustainable practices, exhibit different cost behaviors compared to firms that do not follow such practices. In the sample of this study, only the article by Chen et al. (2023) worked on the relationship between ESG and cost asymmetry. Thus, future studies can analyze whether companies with high ESG scores demonstrate asymmetric behavior in their costs, especially in areas such as research and development (R&D), marketing, and administrative costs, since they may be less likely to cut costs that directly impact their sustainable reputation.
  - (4) Comparisons across sectors with different levels of capital and innovation intensity can provide new insights into how industry characteristics impact cost flexibility. In this sense, future research can compare the cost asymmetry between high-tech sectors (such as software and information technology) and capital-intensive sectors (such as energy or construction), analyzing whether the specific characteristics of each sector influence the way managers adjust their costs.
  - (5) The existing literature generally focuses on established companies, but startups and fast-growing companies have unique cost structures. Uncertainty and the need for flexibility can make the asymmetric cost behavior different in these companies. Startups face unique funding and growth challenges, which can impact their cost decisions. In this way, future research can analyze the asymmetric cost behavior in startups, especially in technology and biotechnology sectors, where rapid growth and venture

funding are common. It would be interesting to investigate whether these firms adjust their costs more quickly than mature firms, given their capital needs and pressure for innovation.

- (6) The impact of gender diversity on asymmetric cost behavior is still underexplored but relevant, especially as more companies adopt inclusive practices. Among the articles in the sample of this study, the only one that analyzed this relationship was the one by Le et al. (2022). Thus, it is suggested that future studies examine whether companies with greater gender diversity in leadership teams have different patterns of cost asymmetry, especially in periods of crisis or growth.
- (7) The literature still lacks comparative studies between public and private sector entities, highlighting how public policies influence the behavior of cost stickiness. Future research can analyze how different government resource allocation policies affect cost behavior in public sector companies. In this sense, it is interesting to investigate whether public organizations are less flexible in their cost adjustments due to bureaucracy and more rigid processes.
- (8) In the studies by Hartlieb and Loy (2022) and Filip et al. (2023), the effect of smoothing the results on the asymmetric cost behavior was analyzed. However, there is a lack of studies that analyze the opposite relationship, i.e., whether the smoothing of the results influences the asymmetric behavior of costs. Thus, it is suggested that future research investigate how the smoothing of results impacts cost stickiness behavior in different emerging and developed markets, and how different regulations and economic cultures influence this relationship.
- (9) The covid-19 pandemic has subjected firms to liquidity pressure and financing difficulties (Wang et al., 2023). In this sense, in the study by Wang et al. (2023) the availability of bank credit in response to the pandemic was examined, analyzing the asymmetric behavior of interest expenses. However, the impact of the covid-19 pandemic on the asymmetric cost behavior still has room for more comprehensive analyses. In this way, future studies can investigate how the pandemic affected asymmetric behavior in different cost categories, such as cost of goods sold and selling, general, and administrative expenses. In addition, it is also suggested to analyze this relationship in companies in sectors hard hit by the pandemic, such as tourism and aviation, compared to less impacted sectors.
- (10) Governance in family businesses is still an unexplored area in the context of cost stickiness, despite the importance of these companies in global

economies. Thus, future research can explore how corporate governance in family businesses influences asymmetric cost behavior. This relationship can also be analyzed during periods of leadership transition or family succession, which can introduce changes in cost management decisions.

In general, future research suggestions point to several opportunities for deepening and expanding knowledge about the asymmetric behavior of costs. The integration of new technologies such as AI and automation, the impact of external economic factors such as inflation and macroeconomic shocks, as well as the influence of ESG practices, are promising areas for future investigations. Additionally, analyzing specific contexts, such as family businesses, startups, and capital-intensive industries, will be able to provide valuable insights into how different organizational structures and market pressures affect cost flexibility.

#### 4. FINAL CONSIDERATIONS

The present study aimed to perform a bibliometric analysis of the scientific production on cost stickiness, considering the publications indexed in the Scopus platform between the years 2003 and 2023. The results reveal a growing academic interest in the subject, especially from the 2010s onwards. The analysis highlighted authors and journals of great relevance, such as Rajiv Banker and the *Journal of Management Accounting Research*, respectively. Academic production is largely concentrated in countries such as the United States, China, and South Korea, with international collaboration increasingly evident, especially between the United States and China. It was also observed that there are still significant gaps in regions such as South America and Africa, which highlights the need for further investigation in these contexts.

This study offers an overview of the scientific production cost stickiness, presenting the main authors, countries, journals and articles on the subject. In addition, suggestions for future research were presented, such as the impact of digital transformation, ESG practices, and external economic factors on asymmetric cost behavior. Thus, this study contributes to academics and researchers who are interested in delving into the literature on cost stickiness, which can stimulate the production of new academic papers on the subject. Also, the study can help managers and accounting professionals better understand the factors that influence cost asymmetry.

The limitations presented in this study are typical of a bibliometric search. One limitation refers to the temporality of the studies, since older articles are more likely to be cited than more recent articles. Thus, a relevant article on the subject, but which was recently published, is less likely to be among the most cited. Besides,

the use of metrics such as number of citations may introduce bias, as it may be influenced by factors such as journal visibility, open access, language of publication or self-citations. Such limitations should be considered when interpreting the results, and future studies may explore complementary approaches, such as systematic reviews and meta-analysis.

### Author contributions:

**Bubeck, S. K.:** Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing – original draft, Writing, review, and editing, Visualization, Supervision, Project administration.

Stephan Klaus Bubeck (Bubeck, S. K.)

### Conflict of interest statement

Authors declare that, throughout the research process, there has not been any sort of personal, professional, or economic interest that may have influenced the researchers' judgement and/or actions during the elaboration and publication of this article.

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Contact: sbubeck@furb.br