



Systematic Literature Review: Studies on Cost Stickiness Behavior under Uncertainty Conditions

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INFO ARTIKEL

Histori Artikel :

Tgl. Masuk : 01-03-2024

Tgl. Diterima : 29-03-2024

Tersedia Online : 30-03-2-24

Keywords:

Cost Stickiness, Uncertainty, Cost Behavior

ABSTRACT

The uncertainty has attracted attention and has become essential among managers, investors, and researchers because it is a consideration in decision-making, including cost decisions. Based on previous research, cost behavior tends to be sticky when activity increases or decreases. This research analysis is uncertainty associated with cost stickiness behavior. Some studies mentioned that cost accounting and management books have not yet discussed cost stickiness. The study aims to determine the association of uncertainty with cost stickiness behavior through a systematic literature review. Using existing studies in the Scopus and Google Scholar databases, researchers try to map research on cost stickiness to contribute to developing literature and future research. The analysis was conducted on 27 eligible articles based on the criteria and then mapped based on the year of research, author, research sample, observation period, theory used, variable measurement, research results, and research gap. Researchers found that the impact of uncertainty on cost stickiness still varies. Future research can discuss and expand the analysis to understand long-term uncertainties, such as global trade policy or climate change, as well as use a variety of measurements or expand the scope of research.

INTRODUCTION

Uncertainty exists for several reasons under various conditions. Economic Policy Uncertainty (EPU), for example, can be caused by the uncertainty of future government policies, how the regulatory framework will apply, and how decisions will be made. EPU is a type of uncertainty that can affect the business world. In practice, firms may face internal or external uncertainty. External uncertainty includes political uncertainty, macroeconomics, interest rates, and market volatility (Kallapur & Eldenburg, 2005; Lee et al., 2019). Internal uncertainty

occurs when a company faces with unpredictable conditions from its stakeholders, such as consumers, suppliers, and regulators.

Economic policy uncertainty has attracted public attention worldwide and has become an essential topic among managers, investors, and researchers (Lee et al., 2020; Jin & Wu, 2021), according to Baker et al. (2016). According to Kim and Harjoto (2023), demand uncertainty makes it difficult for firm managers to predict optimal investment and capital expenditure decisions that directly affect the firm's ability to produce its products, especially the choice between

investing in fixed or variable inputs. Ola et al. (2018) mentioned that political uncertainty in managers' operational decisions would cause changes in cost behavior. The uncertainty that occurs, whether internal or external, has equally attracted managers' attention and their behavior toward the company's costs and financial activities. Company decisions will be influenced by uncertainty. According to Ray et al. (2008), financial activity can affect the cost behavior of an organization. Financial activity information can help managers plan and make cost decisions by anticipating future costs more precisely. In accounting, costs are divided into fixed and variable costs, and it is also stated that costs and volume of activity have a symmetrical relationship. However, there are conditions where when sales fall, operating costs remain even if there is an increase; the increase remains the same. Malcom (1991) found that some costs remain the same when activity rises or falls. This is because some costs do not change in the same way as the amount of activity. This condition is referred to as cost stickiness. By prior research, researchers such as Anderson et al. (2003), Slamah and Abulezz (2014), Wahyumingtyas and Nugrahanti (2014), and Afifah et al. (2018), Kim and Harjoto (2023) propose that cost stickiness arises from uncertainty about future demand for products sold by the company. This leads managers to prioritize maintaining unused resources over reducing them when sales decline. Conversely, when managers choose to adjust costs based on activity volume, cost stickiness will not occur. According to Krisnadewi et al. (2022), several researchers found that the existence of cost stickiness has an impact on company performance and market performance. However, according to Bhimani et al. (2019) and Hanif (2018), accounting and cost management textbooks have yet to discuss cost stickiness. Then, in contrast to other research in economics, research related to cost stickiness has yet to reach a definite conclusion about the causes of this behavior even though, according to Anderson et al. (2003), research showing cost stickiness behavior has been

conducted since 2003. Therefore, to enrich the study and to be studied further, researchers must conduct more intensive cost-stickiness research.

The author tries to map the cost stickiness research. Using existing research in the Scopus and Google Scholar databases and limiting the scope of the study is about the interaction between uncertainty and cost stickiness behavior. The issues raised in this research are:

- External uncertainty, includes political uncertainty, demand uncertainty, and market volatility.
- Macroeconomic uncertainty, including economic crisis and
- Internal uncertainty includes unpredictable conditions from stakeholders such as consumers, suppliers, and the government as a policy maker.

This study aims to determine the development of cost behavior research, especially cost stickiness behavior, and can contribute by providing an overview of previous research on cost stickiness behavior for future research. This literature review is expected to answer the following questions:

RQ1. Is uncertainty associated with cost stickiness behavior?

The structure of this literature review consists of section 1, containing an introduction that discusses the background, objectives, and research questions. Section 2 discusses the theory used and the research framework. Section 3 presents the planning of the review implementation, including the data used and the design of reporting the review results. Section 4 discusses the review results regarding the mapping of articles based on research years, authors, research samples, observation periods, theories used, variable measurements, research results, and research gaps. Finally, section 5 discusses conclusions, limitations, and suggestions for future research.

Research Method

Planning the review - at this stage, the researcher took two steps to plan and

determine the literature review strategy. The two steps were to select a database that would be used to obtain articles to be reviewed in the study. Then, in the second step, researchers will select articles based on predetermined criteria. In the first step, researchers identified several databases and selected Scopus and Google Scholar. Scopus articles are selected because they are high quality and credible due to the rigorous review process at each publication outlet. Google Scholar was selected because its database covers various publication outlets in accounting, finance, and business. So, the two databases were chosen to receive the articles to be reviewed. Furthermore, the second step is establishing the criteria for selecting articles used in this study. The selection of these criteria refers to several previous SLR articles, namely Johnstone (2020), Krisnadewi et al. (2022), and Ningrum (2023); the researcher compiled inclusion and exclusion criteria to ensure that the articles selected in this study are eligible both in terms of quality and relevance to the research question. Table 1 presents the inclusion and exclusion criteria used in this study.

Conducting the review - At this stage, we searched for articles in the Scopus and Google Scholar databases with the keywords "Uncertainty" AND "Cost Stickiness Behavior". Then, we obtained 1009 articles, which consisted of 27 Scopus articles and 569 Google Scholar articles. After that, the researcher conducted screening, where the first screening was to identify 22 duplicate articles. The similarity is caused by the fact that the article is contained in two databases, Scopus and Google Scholar. Therefore, the researcher removed 11 articles and used the remaining 11 for screening to the next stage so that the remaining 585 articles continued to the second screening. The second screening stage is based on the paper's availability either in the database or on the journal's website that published the paper. Thirty-six articles were not available in the Google Scholar database, so these articles were not included in the analysis.

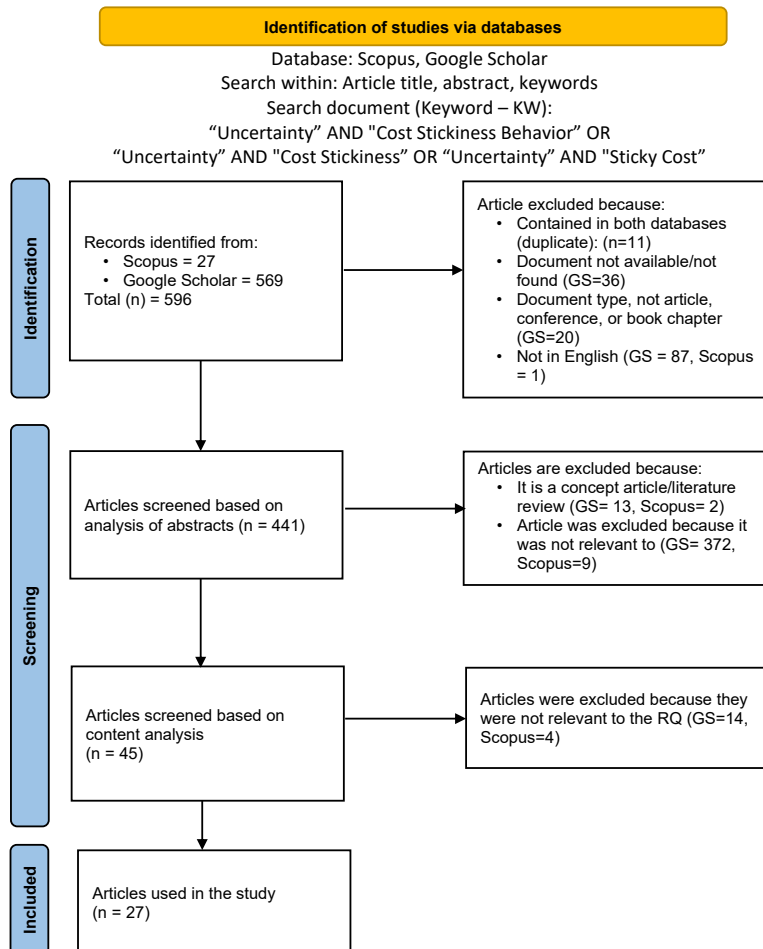
The third screening is language criteria; this research limits articles in English; 87 articles on Google Scholar and 1 article on Scopus are excluded because they use languages other than English. Furthermore, the fourth screening is related to the type of document used in the study: articles, book chapters, and conference papers. The determination of these three types of documents is based on considering the publication process of articles, book chapters, and conference papers through a blind review process to be published. Based on the screening results 20, documents on Google Scholar are not articles, book chapters, or conference papers, so the documents are excluded from the sample.

The next step is to select articles based on the abstract. Based on the analysis of the abstract, 13 articles on Google Scholar and 2 articles on Scopus are literature reviews. In addition, 372 articles from Google Scholar and 9 from Scopus are irrelevant to the research question, so these articles are excluded from the analysis, leaving 45 articles.

The last screening is an analysis of the article content. Based on the screening results, 18 articles were excluded because they did not specifically examine the impact of uncertainty and its interaction with cost stickiness, which was irrelevant to the research question posed.

After passing all the screening stages that have been carried out, 27 final articles remain to be used in this study. After obtaining 27 articles that are considered eligible based on predetermined criteria, the next step is for researchers to extract data by reading articles and tabulating data in Microsoft Excel. The extracted data includes the year of research, author, research sample, observation period, theory used, research variables, research results, and research gaps. The following is the article selection process:

| Table 1 Inclusion and Exclusion Criteria | |
|---|--|
| Search Engine / Database (DB) | Scopus, Google Scholar |
| Keyword (KW) | "Uncertainty" AND "Cost Stickiness Behavior" OR "Uncertainty" AND "Cost Stickiness" OR "Uncertainty" AND "Sticky Cost" |
| Exclusion Criteria (EC) | EC1 - Keywords do not appear in article, title, abstract, keywords EC2 - Documents are not in English EC3 - Document type book, thesis, review, conference review, note EC4 - A concept paper or literature review EC5 - Not relevant to the research question |
| Inclusion Criteria (IC) | IN1 - Keywords appear in article, title, abstract, keywords IN2 - Documents are in English IN3 - Article, book chapter, and conference paper document types IN4 - It is empirical research IN5 - Relevant to the research question |



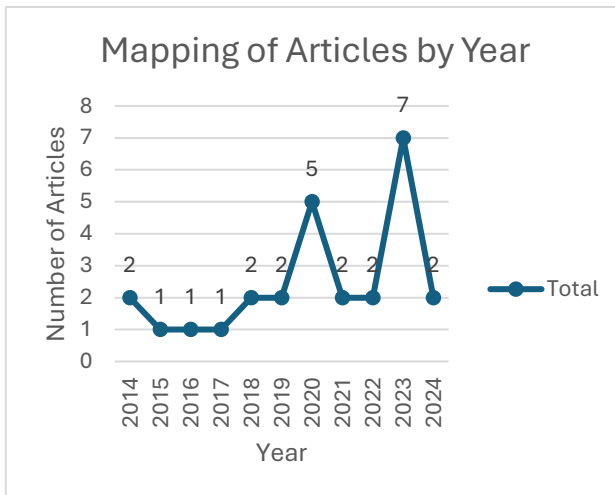
Review Report

After extracting, the researcher will conduct an in-depth review of the 27 articles used as research samples. The next step is to report the research results by mapping the articles based on (a) the year of research, (b) the author, (c) the sample, (d) the observation period, (e) the theory used, (f) research variables, (g) results and (h) research gap.

RESULT AND DISCUSSION

Article Mapping Based on Publication Year

In this section, we present the profile of the articles that make up the research sample based on the year of publication.



Source: author, 2024

In the figure above, it can be concluded that the number of publications regarding the interaction of uncertainty and cost stickiness behavior increased in 2020, reaching five articles per year; this is because 2020 is the year after the covid-19 pandemic, so it is likely that many studies will discuss uncertainty that year, besides that the number rises higher in 2023 which is in line with the development of science in accounting where many researchers are starting to pay attention to cost stickiness behavior, it is likely that in 2024 the number will continue to grow, considering that researchers

conducted research on cost stickiness at the beginning of 2024 so that there were only two studies on the interaction of uncertainty and cost stickiness behavior detected in 2024.

Article Mapping by Author

Based on the researchers' analysis of the articles, one pair of studies with the same author who written by Restuti et al. (2022) and Restuti et al.(2023). These two studies are still used as samples because the two studies have different backgrounds, objects, and samples. The first study investigates the relationship between managerial ability and cost stickiness behavior in ASEAN countries. This study also uses managerial ability as a moderating variable when testing the relationship between uncertainty and cost stickiness. This study uses a sample of non-financial firms in five ASEAN member states: Indonesia, Malaysia, Philippines, Thailand, and Vietnam. Singapore is not included in the analysis because it is the only developed country in Southeast Asia. The study uses data from 2013 to 2019 and involves panel data regression analysis with 19,612 firm-year observations. Companies in ASEAN generally have concentrated ownership, and many are family-owned. The second study focuses on how environmental uncertainty affects cost stickiness behavior and how the effect of environmental uncertainty on cost stickiness differs in the context of different firm strategies. In addition, this study also highlights the importance of managerial ability in managing environmental uncertainty and its impact on cost stickiness in Southeast Asian countries.

Article Mapping Based on Research Sample Location

Based on the results of the analysis, 34% of the sample articles are

researched with cross-country samples; this is due to several reasons, such as Zonatto et al. (2018) using research in various countries as a sample to provide greater insight into how different economic factors and business environments can affect corporate cost behavior in various contexts. This is similar to Habib and Hasan (2019) research, where the reason for taking companies from various countries as research samples is to obtain diversity in data and experience that can provide broader and more representative insights. Using a sample that includes companies from various countries, research can produce more general findings that can be widely applied globally. Jin and Wu (2021) argue that cross-country research allows researchers to observe cross-country variations in economic policy uncertainty (EPU). In contrast to some previous studies, Restuti (2023) used six Southeast Asian countries as samples because these countries have similar characteristics in ownership (dominated by family ownership) and similar cultural characteristics. Southeast Asian countries arguably show cultural similarities, such as low levels of uncertainty avoidance, low masculinity, and low long-term orientation, which are associated with higher levels of cost resilience. As for other studies using samples of the same countries. The following distribution of articles by country has been presented in Figure 3:

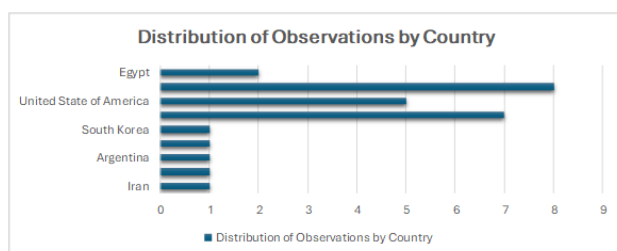


Figure 3. Distribution of Observation by Country

In addition to examining the distribution by country, researchers also found that some sample articles only used non-financial companies as their research samples, such as Stimolo et al. (2019), Chen et al. (2019), Restuti et al. (2022), Jian (2023), Lu et al. (2023) and Jia et al. (2024). In their research, Restuti et al. (2022) used non-financial companies because they focus on certain cost behaviors related to operational and indirect costs, such as selling, general, and administrative costs (SG&A costs). In addition, these costs are closely related to the procurement and development of organizational capital, such as information technology. Therefore, by limiting the analysis to non-financial companies, these studies can focus more on cost aspects relevant to their research topic.

Jian et al. (2023) also focused on non-financial firms because their research focuses on the impact of political uncertainty and officer characteristics on firm cost rigidity. According to Jian et al. (2023), non-financial firms tend to have different cost structures and responses to political changes than financial firms. By limiting the sample to non-financial companies, this study can be more in-depth in analyzing the impact of the variables studied. In addition, Chen et al. (2019) excluded financial institutions and public utilities from their observations due to the financial reporting of financial institutions and public utilities governed by specific regulations in their respective industries. Therefore, Chen et al. (2019) decided to exclude financial institutions and public utilities in their research sample for consistency and clarity of data. Abdelhamid (2021) also excluded banking, financial services, and real property industry sectors due to the specialized nature of these sectors.

These sectors generally have different characteristics regarding strict regulations, complex risks, and unique business patterns. The different characteristics of these sectors may affect the analysis results regarding cost and risk behavior in different contexts. In addition, Lu et al. (2023) specialized in their research in manufacturing companies because the manufacturing sector often has a significant inventory level in its operations. In the manufacturing sector, inventory management is crucial as efficient inventory can affect the company's overall performance.

Article Mapping Based on Observation Period

Based on the observation period, research on uncertainty and cost stickiness behavior has observations of more than equal to 7 years. The average number of observations in research is 57,874 observation data. Of all sample articles, 56% have observations above 57,874 observation data in their research, 26% below 57,874 observations, and 18% do not specifically mention the amount of data observed and only mention the number of companies. Figure 4 below shows the distribution of articles based on the number of observations they made:

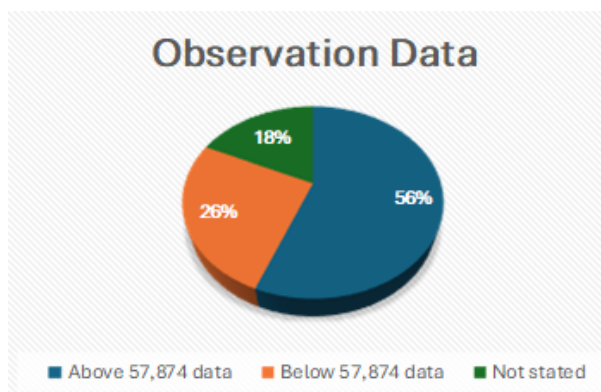


Figure 4. Observation Data

Mapping Articles Based on the Theory Used

Based on the analysis of the theories used, several theories related to uncertainty and cost stickiness behaviour include cost asymmetry, adjustment cost, real options, and institutional theories. Research by Zonatto et al. (2018), Lee et al. (2020), Pan et al. (2021), and Restuti et al. (2022) use cost asymmetry theory, which states that costs respond asymmetrically to changes in activity because managers make deliberate decisions in adjusting resources. In addition, Jin et al. (2021) and Jian et al. (2023) use the adjustment cost theory, which states that companies with high funding costs and significant funding constraints will need help obtaining new resources and cutting expenses when faced with political uncertainty. Some studies use real options theory, namely Chen et al. (2019) and Restuti et al. (2023), which state that Real options theory allows managers to integrate flexibility and adaptation in their investment strategies or even delay their decisions amid uncertainty. In context of cost stickiness, companies must decide to increase resources (make investments) or delay investment and release resources when sales fall. These are choices in responding to uncertainty.

Mapping of Articles Based on Variables and Measurement of Variables Used Based on the results of the analysis, there are variations in measuring uncertainty, including:

- Some researchers, such as Jin and Wu (2021), Lu et al. (2023) and Kim and Harjoto (2023), use the Economic Policy Uncertainty (EPU) index developed by Baker et al. (2016) to measure uncertainty. This index covers various aspects of economic policy uncertainty, such as fiscal policy, monetary policy, and national security.

This study uses an aggregate approach to measure the economic uncertainty companies face. Jin and Wu (2021) calculated this index based on the monthly volume of news articles discussing EPU in 10 leading newspapers in the United States. The results of their analysis were then used as an index with an average of 100 each month from 1985 to 2009. In addition, the study also created 11 categorical EPU indices covering monetary policy, fiscal policy, taxes, government spending, health care, national security, entitlement programs, regulation, financial regulation, trade policy, and sovereign debt and currency crises.

- Several other studies use regional or national changes in officials and changes in company leaders to measure uncertainty, such as research by Ola et al. (2018), Lee et al. (2020), Pan et al. (2022) and Jian et al. (2023). For example, in the research of Jian et al. (2023), uncertainty is measured through regional political uncertainty, represented by changes in provincial leadership in China. The study used official changes in the office of the governor or provincial party secretary as a surrogate variable for regional political uncertainty. Political uncertainty is measured by two indicators: *Uncertain_If* and *Uncertain_Num*. *Uncertain_If* takes the value of 1 if the provincial governor or provincial party secretary experienced a change between the fourth quarter of the previous year and the third quarter of the current year; if the change occurred during the fourth quarter, it is assumed that the impact of the official change will be most pronounced in the following year. *Uncertain_Num* is the total number of changes in provincial party secretaries and governors in one year. In addition, research by Lee et al. (2020) also measures uncertainty with

dummy variables, using general election years worldwide as empirical proxies. This dummy variable is set to 1 for election years and 0 for other years. This assumes that the timing of elections is beyond the company's control and that the election period causes uncertainty.

- In addition, several other studies measure uncertainty with different measures, such as Restuti et al. (2022), which measures uncertainty variables through three dimensions, namely munificence, dynamism, and complexity; Chen and Xu (2023), who measure managers' perceptions; and Abdelhamid (2021), who measures the standard deviation of company sales during the sample period. Restuti et al. (2022) measures uncertainty variables through three dimensions, namely munificence, dynamism, and complexity. Munificence is measured using sales growth and operating income growth. Sales growth (operating income) is the antilog of the natural logarithm regression coefficient of the regression of total sales (operating income) on the variable index for a year over five years (Xue et al., 2011). The degree of dynamism is operationalized by measuring the volatility of sales and operating income. The antilog standard error of the natural logarithm of total sales (operating income) against the index variable over five years is the metric used to quantify sales (operating income) volatility (Xue et al., 2011). The degree of complexity is quantified using the Herfindahl index of business and geographic segments (Bushman et al., 2004). The multi-item measures of each dimension are then converted into single-item measures by taking a weighted average, weighted by the factor loading values in the underlying principal component analysis (Xue et al., 2011). Furthermore, Chen and Xu

(2023) measured uncertainty based on the occurrence of uncertainty-related words in the Management Discussion and Analysis (MD&A) section of the company's 10-K annual report. These uncertainty-related words cover customer demand, competition, market conditions, liquidity, price, revenue, production, and investment. This measure analyses cross-sectoral variation in the relationship between uncertainty and cost behavior. Finally, Abdelhamid (2021) measures uncertainty using the standard deviation of firm sales over the sample period following the measure developed by Banker, Byzalov, and Plehn-Dujowich (2014); demand uncertainty is measured by the standard deviation of ln-change in revenue ($\Delta \ln REVi, t$) for all valid observations of the firm.

Measurement of Cost Stickiness Behavior Variable

Cost stickiness refers to the tendency of costs to stay the same proportionally with changes in business activity. Based on the analysis results, almost all sample articles in this study used the research of Anderson et al. (2003) as their reference in measuring cost stickiness. Anderson et al. (2003) generally measured cost stickiness with a rational model and hypothesis to find cost stickiness empirically. Through their research, they stated, "If the traditional fixed- and variable-cost model is valid, upward and downward changes in costs will be equal." They examined SG&A (Selling, General, and Administrative) with a sample of 7,629 US companies from 1979-1998. The results show that when the sales level increases by 1%, SG&A costs increase by 0.55%, but if sales decrease by the same amount, SG&A costs decrease by only 0.35%, which is clear evidence that the cost response to the same level of activity change is different.

After that, many studies on cost stickiness began to refer to the research of Anderson et al. (2003) as in the research of Banker, Byzalov, and Plehn-Dujowich (2014), the model used to measure cost stickiness is a log-linear regression model that relates cost changes to changes in sales simultaneously. This model considers the percentage change in costs for each percentage change in sales, which reflects the degree of reluctance of companies to adjust their costs and changes in sales levels. The regression model used in the study is

$$\Delta \ln \text{COST}_{it} = \beta_0 + \beta_1 \Delta \ln \text{SALES}_{it} + \gamma' \text{controls}_{it} + \varepsilon_{it}$$

Where:

- $\Delta \ln \text{COST}_{it}$ is the log change of costs for the company i in year t .
- $\Delta \ln \text{SALES}_{it}$ is the log change of sales revenue for the company i from year t
- controls_{it} is the control variable.
- β_1 is a coefficient that measures the percentage change in costs for 1 percent change in sales revenue, which describes the level of cost stickiness.

Jin (2021) uses a regression model that considers the response of firm costs to changes in sales ($\Delta \ln \text{SALE}$). Cost stickiness is measured as the difference in the sensitivity of costs to a decrease in sales ($\text{DEC} * \Delta \ln \text{SALE}$) compared to an increase in sales ($\Delta \ln \text{SALE}$). The DEC coefficient in the regression model indicates the extent to which a firm's costs tend to be "sticky" or do not adjust proportionally to changes in sales. In addition, Choi (2020) uses the following regression formula to measure cost stickiness, which is used to evaluate the effects of listing status and the level of cost stickiness in private and public

companies in the context of his research:

$$\Delta SG\&A_{it} = \beta_0 + \beta_1 \Delta Sales_{it} + \beta_2 DecDummy_{it} \times \Delta Sales_{it}$$

where:

- $\Delta SG\&A_{it}$ is the change in selling, general, and administrative (SG&A) expenses from the previous year to the current year.

- $\Delta Sales_{it}$ is the change in sales from the previous year to the current year.

- $DecDummy_{it}$ is a dummy variable that indicates whether the company has a fiscal year ending in December.

β_0 , β_1 and β_2 are regression coefficients that will be estimated to measure the effect of sales changes and listing status on cost stickiness.

In other studies, Jin and Wu (2021) also adopted and expanded the formula developed by Anderson et al. (2003) with the following model:

$$\Delta \ln XOPR_{i,t} = \alpha_0 + \alpha_{1,i,t} \Delta \ln SALE_{i,t} + \alpha_{2,i,t} DEC_{i,t} * \Delta \ln SALE_{i,t} + u_{i,t}$$

Where:

- $\Delta \ln XOPR_{i,t}$ is the log change in operating expenses for the company i in year t .

- $\Delta \ln SALE_{i,t}$ is the log change in sales.

- $DEC_{i,t}$ is a dummy variable that takes the value 1 if sales have decreased in year t and 0 if sales have increased.

- α_0 , $\alpha_{1,i,t}$, and $\alpha_{2,i,t}$ are regression coefficients.

- $u_{i,t}$ is the random error in the model.

Article Mapping Based on Research Results

Table 2 presents the sample articles used in this study, along with country data, observation period, the position of the uncertainty variable in the research model, and a summary of the association between uncertainty and cost stickiness. Almost 60% of the sample articles found evidence that uncertainty positively influences cost stickiness. The studies with positive results have diverse sample settings,

such as the United States, China, and Egypt, and some studies have cross-country settings. In addition, 37% of the sample articles found evidence that uncertainty negatively influences cost stickiness, and the rest stated that uncertainty does not affect cost stickiness. The author analyzes that studies with settings in the United States show positive results, except in the research of Lu et al. (2023), where the study results provide evidence of a negative relationship between uncertainty and cost stickiness. The reason for the difference may be due to the research of Lu et al. (2023) having a reasonably long observation period compared to other observation periods both in the same setting and different settings; the length of observation carried out is 37 years of observation starting from 1984-2021. The reason given by Lu et al. (2023) for the negative effect of uncertainty on cost stickiness is that economic uncertainty makes managers pessimistic about future demand, which in turn reduces stickiness inventory. This happens because managers tend to be more responsive to changes in demand and more flexible in managing their inventory during periods of policy uncertainty. The reason for the positive influence of uncertainty on cost stickiness with the United States setting, for example, is the research of Lee et al. (2023), who found positive evidence and stated that in situations of uncertainty, managers tend to choose to postpone mandated resource reduction decisions until they have a better understanding of the sustainability of the demand decline. This causes cost stickiness to increase during the election period (uncertainty period) compared to the non-election period.

| No | Author | Country | Observation Period | Position of Uncertainty Variable | | | Its Impact on Cost Stickiness Behavior | | |
|----|-------------------------------------|--------------------------|--------------------|----------------------------------|------------|-----------|--|----------|-----|
| | | | | Independent | Moderation | Mediation | Positive | Negative | N/A |
| 1 | Lu et al. (2023) | United States of America | 1984-2021 | ✓ | | | | ✓ | |
| 2 | Restuti et al. (2022) | Cross Country | 2013-2019 | ✓ | | | ✓ | | |
| 3 | Jin and Wu (2021) | Cross Country | 1992-2012 | | | | | | |
| | * high government expenditure group | | | ✓ | | | | ✓ | |
| | * low government expenditure group | | | ✓ | | | ✓ | | |
| 4 | Li et al. (2020) | China | 2013-2019 | ✓ | | | ✓ | | |
| 5 | Abdelhamid (2021) | Egypt | 2004-2017 | | ✓ | | ✓ | | |
| 6 | Jian et al. (2023) | China | 2008-2019 | ✓ | | | | ✓ | |
| 7 | Pan et al. (2023) | China | 2000-2015 | ✓ | | | ✓ | | |
| 8 | Lee et al. (2023) | United States of America | 1995-2012 | ✓ | | | ✓ | | |
| 9 | Ola et al. (2018) | Iran | 2009-2016 | ✓ | | | ✓ | | |
| 10 | Restuti et al. (2023) | Cross Country | 2013-2019 | ✓ | | | ✓ | | |
| 11 | Zhu et al. (2019) | China | 1999-2007 | | ✓ | | | ✓ | |
| 12 | Zonatto et al (2018) | Cross Country | 2004-2013 | ✓ | | | | | ✓ |
| 13 | Jeon et al. (2024) | United States of America | 2006-2018 | | ✓ | | ✓ | | |
| 14 | Chen and Xu (2023) | United States of America | 1996-2017 | ✓ | | | ✓ | | |
| 15 | Kim and Harjoto (2023) | United States of America | 2003-2019 | ✓ | | | ✓ | | |
| 16 | Yang and Hu (2020) | China | 2008-2018 | | ✓ | | ✓ | | |

| No | Author | Country | Observation Period | Position of Uncertainty Variable | | | Its Impact on Cost Stickiness Behavior | | |
|----|---|----------------------|--------------------|----------------------------------|------------|-----------|--|----------|-----|
| | | | | Independent | Moderation | Mediation | Positive | Negative | N/A |
| 17 | Kitching et al. (2016) | Cross Country | 1990-2013 | | ✓ | | | ✓ | |
| 18 | Choi et al. (2020) | South Korea | 2001-2014. | | | ✓ | | ✓ | |
| 19 | Kim and Zhou (2023) | Cross Country | 1992-2017 | | ✓ | | ✓ | | |
| 20 | Long et al. (2023) | China | 2009-2018 | | ✓ | | ✓ | | |
| 21 | Slamah and Abulezz et al. (2014) | Egypt | 2001-2007 | ✓ | | | ✓ | | |
| 22 | Banker, Byzalov and Dujowich (2014) | Cross Country | 1979-2008 | ✓ | | | ✓ | | |
| 23 | Jia et al. (2024) | China | 2007-2019 | ✓ | | | | ✓ | |
| 24 | Stimolo and Porporato (2019) | Argentina | 2004-2012 | ✓ | | | | ✓ | |
| 25 | Hassanein and Younis (2020) | United Kingdom | 2001-2015 | ✓ | | | | ✓ | |
| 26 | Zanella et al. (2015) | United Arab Emirates | 2002-2011 | ✓ | | | | | ✓ |
| 27 | Xu and Sim (2017) | China | 2010-2014 | ✓ | | | | ✓ | |

In addition, researchers observe that research conducted in companies in China also shows mixed results, such as research by Pan et al. (2023), which states that uncertainty on cost stickiness has a positive influence with the justification that as the level of political uncertainty increases, companies tend to postpone the adjustment of promised resources until they are more confident about the certainty of a decrease in demand. Therefore, cost stickiness appears when uncertainty increases and reverses when uncertainty is resolved. Meanwhile, research by Jia et al. (2024) mentioned that uncertainty on cost stickiness negatively influences the reason that high uncertainty, including trade policy effect uncertainty (TPEU), can lead to reduced cost stickiness in the company. This is due to increased uncertainty around business decisions that encourage managers to respond more to changing market conditions and uncertain business environments. Despite having the same country setting, there are differences in research results shown by Pan et al. (2023)

and Jia et al. (2024); this may be due to the different measures of uncertainty they use. Pan et al. (2023) measured political uncertainty, while Jia et al. (2024) measured uncertainty with trade policy effect uncertainty.

Researchers also found the results of researchers who stated that uncertainty does not affect cost stickiness. The research was conducted by Zanella et al. (2015) and Zonatto et al. (2018). In his research, Zanella et al. (2015) states that the interaction between sales growth and previous sales decline is not statistically significant. This shows that the factors tested in the hypothesis, namely changes in the GDP growth rate and the ratio of total assets to sales, have no significant effect on cost constancy in the context studied. As for Zonatto et al. (2018), the results showed no asymmetric behaviour in costs during the period of economic recession and financial crisis; the decrease in costs was not higher than their increase in response to a 1% change in demand, which indicates that costs did not have asymmetry in their behavior during the period. No cost stickiness was observed during the recession period.

Discussion on Research Gaps

Based on the results of mapping articles based on the year of research, author, research sample, observation period, theory used, variable measurement, and results of research that has been done, the following are research gaps that can be used as recommendations for future research:

1. Based on the overall research, the impact of uncertainty on cost stickiness still varies. Hence, future research may be conducted on these variables again.
2. Based on the analysis of variables, in contrast to cost stickiness

behaviour, most of which refer to Anderson et al. (2023), the type and size of uncertainty are still very diverse; this refers to internal or external uncertainty. Some types of uncertainty identified from this study include macroeconomic uncertainty, demand uncertainty, political uncertainty, and trade policy effect uncertainty, so future research can consider the diversity of uncertainty and examine it either partially or simultaneously. Researchers can also extend the analysis to understand how long-term uncertainties, such as global trade policy or climate change, affect firms' cost behavior. In addition to uncertainty, future research should consider additional contextual variables that may affect cost stickiness behavior, such as industry structure, firm size, or market characteristics in the region under study.

3. Based on the scope of the observation, future researchers can also examine the effect of uncertainty on cost stickiness by comparing the impact of uncertainty on cost stickiness at the local government level with the national or international level. This can provide a deeper understanding of how local, national and international factors affect the relationship between uncertainty and cost stickiness.

4. Furthermore, a suggestion for future research is to add control variables. To strengthen the analysis of future research, several factors, such as law, adjustment costs related to employee dismissal, public trust index, internal company factors such as organizational structure, corporate culture, and internal policies, and consideration of other relevant additional control factors, can be controlled.

5. Finally, future research can expand using different samples and

methodologies. Cross-country research in sample articles is still limited, but it can be considered for future research to allow for a diversified use of samples. Researchers can also consider using more diverse research methods, such as in-depth interviews, surveys, or direct observation, to understand company cost behavior better.

CONCLUSION

Based on the analysis of the result, the findings regarding the effect of uncertainty on cost stickiness have provided an overview of how costs behave under uncertainty conditions. This research is expected to be a reading source for decision-making in business practice. Some previous researchers mentioned that in contrast to other economic research, accounting and cost management textbooks have yet to discuss cost stickiness, and research related to cost stickiness has yet to reach a definitive conclusion. Therefore, it is hoped that this study can contribute to helping future research to enrich future studies on cost stickiness. Based on the results of the analysis that has been conducted, research on this subject can develop the discussion and expand the analysis to understand how long-term uncertainties, such as global trade policy or climate change, by using a variety of measurements or expanding the scope of research. In addition, this study also has limitations because it only uses two databases for article sampling and does not include non-English studies, which may have some relevant research on the effect of uncertainty on cost stickiness but not written in English.

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