



## The Validity of the Cost Stickiness Theory in SMEs and The Decision-Making Styles of Managers: Evidence from Turkey

Hakan Yazarkan<sup>a</sup>

Sema Yiğit<sup>b</sup>

Bahadır Baş<sup>c</sup>

<sup>a</sup> University of Ordu, Faculty of Economics and Administrative Sciences, Department of Business Administration, hayazarkan@gmail.com

<sup>b</sup> University of Ordu, Faculty of Economics and Administrative Sciences, Department of Business Administration, semayigit@yahoo.com

<sup>c</sup> Head of Chamber of Certified Public Accountants of Ordu, bahadirbas@hotmail.com

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### **Abstract**

**Purpose:** Cost behaviour is the response of costs to changes in the volume of activity of businesses. In the literature, cost behaviour is discussed in two ways: symmetrical and asymmetrical. Firstly, this study aims to analyze the data on sales revenue and cost items related to sales of *Small and Medium-Sized Enterprises* (SMEs) with the help of the ABJ model in terms of cost stickiness. Another aim of the study is to determine the decision-making styles of the managers who make investment decisions in these enterprises. Thus, cost stickiness can be interpreted in terms of the manager's decision-making style in the companies that make up the sample.

**Methodology:** A balanced panel data analysis method was used to test the cost stickiness levels in the study. The decision-making styles scale was used to determine the decision-making styles of the managers.

**Findings:** The study concluded that the cost stickiness theory was valid for all variables in a one-year period, while the stickiness level of only general management expenses decreased in a two-year period. In addition, it has been determined that the managers of the enterprises adopt the rational decision-making style.

**Originality/Value:** To measure the cost stickiness level of a business, various cost and revenue figures that occur in that business over long periods are needed. Companies do not want to share this data with third parties or institutions for various reasons. For this reason, studies on cost stickiness have been carried out on large-scale enterprises that have to offer their financial statements to the public. The originality of this study is that it tests the theory of cost stickiness for small and medium-sized enterprises. In addition, it is thought that the study is important in terms of considering cost stickiness together with the decision-making style of the manager.

## **Introduction**

One of the essential tools that help businesses to achieve and maintain competitiveness is that the company's effective cost management. Companies are suggested to fulfill all their strategic goals by using the mentioned tools. For this reason, businesses try to control these cost elements while determining the costs with the cost management they carry out. At this point, examining the behaviour of costs becomes a critically important function. According to the theory of traditional cost behaviour, costs will either move symmetrically with the volume of activity (variable costs) or remain constant (fixed costs). However, many studies in recent years have revealed that this critical assumption is not always valid. It has been observed that the costs that need to increase or decrease proportionally with the volume of activity, as envisaged by this acceptance, often change asymmetrically rather than symmetrically.

Costs increase more in the increase of the activity volume compared to the decrease in the activity volume of the same magnitude, and they exhibit a sticky behaviour. This situation is expressed in the literature with the concepts of "asymmetric cost behaviour" or "cost stickiness". When the literature on cost stickiness is examined, it is striking that many studies have been carried out in various countries. However, almost all the studies (Anderson, Banker, & Janakiraman, 2003; Yk & kaya, 2011, elik & Kk, 2013; Chen, Kama, & Lehavy, 2015; Yazarkan & Yiđit, 2016) have investigated whether cost stickiness is valid in large-scale enterprises.

In this context, in this study, the cost stickiness levels of SMEs were measured to contribute to the literature. In the study, the data of 70 enterprises operating in the province of Ordu, Turkey, between 2010-2020 were tested with panel data analysis. Most of the businesses in the sample are those operating in the textile, food, and retail sectors.

In addition, cost stickiness was associated with managerial behaviour, and the decision-making styles of managers who made investment decisions in companies that collected data were determined.

In this context, in the first part of the study, the concepts of the ABJ model and cost stickiness were mentioned, and then these concepts were associated with management. In the second part of the study, the data were analyzed, and the results were evaluated.

### **Cost Stickiness and the ABJ Model**

Cost behaviour expresses the effect of changes in the volume of activity of the enterprise on how any cost element will change or how it will behave. Knowing in advance how each cost element will behave depending on the changes in the volume of activity in cost management will undoubtedly increase the accuracy of many decisions (Kartal, 2004, p. 79).

Although there are studies (Noreen & Soderstrom, 1994; Noreen & Soderstrom, 1997) that stated that costs would not change at the same rate as the change in the volume of activity, the term “Cost Stickiness” concept was used for the first time by Anderson, Banker and Janakiraman (2003) for this phenomenon.

The authors explained the cost stickiness in their study as follows (Anderson, Banker, & Janakiraman, 2003, p. 48):

*“Costs are sticky if the magnitude of the increase in costs due to the increase in the activity volume is not equal to the decrease in the costs against the decrease in the activity volume.”*

In the relevant literature, various factors cause cost stickiness. The first of these is the action style of the managers against the decrease in demand. In a decrease in demand, managers have to choose between using the same capacity and incurring the exact transaction costs or reducing their resources and thus costs. Usually, managers delay the reduction or restructuring of business resources for a while unless they are sure about continuing the decrease in demand. This situation causes the cost stickiness for that period to be higher than for the future periods or to

observe lower cost stickiness in more extended periods (Anderson, Banker, & Janakiraman, 2003, p. 48-49).

Anderson et al. (2007) divided the factors that cause cost stickiness into three as the constancy of costs, cost control failure, and economic decisions to maintain resources (not reduce costs) throughout the downturn (Anderson, Banker, Huang, & Janakiraman, 2007, p. 7). On the other hand, fixed costs do not change in the short run and are only related to the change in the volume of activity in the long run (Argilés & García-Blandón, 2009, p. 579).

Also, recent research shows that managerial discretion in arranging resources leads to sticky costs, and these costs are less responsive to activity declines than to activity increases. It is expected that the characteristics of the culture in which the manager is in effect this discretion. In addition, reasons arising from legal regulations, business characteristics, social and human resources policies can be counted among the other reasons for cost stickiness. Anderson, Banker, and Janakiraman (2003) conducted a study on the 20-period data of 7629 businesses between 1979 and 1998 and determined that how the “selling, general and administrative (SG&A) costs” items would react to increase or decrease in the sales revenue of the businesses.

For this purpose, they developed the following ABJ model, whose dependent variable is the sum of SG&A costs, and the independent variable is sales revenue (SR).

The authors explain the reason for using these dependent variables in the model in two ways. The first is that due to many enterprises, they have worked on an extensive data set, and these are the most relevant variables for the database they use (Compustat Database).

The second reason is that sales volume directly affects many SG&A components, and therefore, SR and SG&A costs are closely related (Anderson, Banker, & Janakiraman, 2003, p. 48). The ABJ model developed by taking these variables into account is as follows:

$$\log \left[ \frac{SG\&A_{i,t}}{SG\&A_{i,t-1}} \right] = \beta_0 + \beta_1 * \log \left[ \frac{SR_{i,t}}{SR_{i,t-1}} \right] + \beta_2 * Decrease\_Dummy_{i,t} * \log \left[ \frac{SR_{i,t}}{SR_{i,t-1}} \right] + \varepsilon_{i,t}$$

Due to the logarithmic nature of the model, it is easy to estimate the change in SG&A costs and SR as a percentage. Therefore, the  $\beta_1$  coefficient measures the average percentage increase in SG&A costs against a 1% increase in SR, while the sum of  $\beta_1$  and  $\beta_2$  measures the average percentage decrease in SG&A costs in case of a 1% decrease in SR. If SG&A costs are sticky, the increase in SG&A costs when SR increases should be greater than the decrease in SG&A costs when SR decreases by the same level. Therefore, empirically, the model would be expected to result in a positive value for  $\beta_1$  and a negative value for  $\beta_2$ . Most of the studies testing the cost stickiness theory have been based on this model. For this reason, this study investigated whether cost stickiness is valid for SMEs using the ABJ Model.

### Cost Stickiness and Management

Although many factors affect cost stickiness, one of these factors is the manager because the behaviours that cause stickiness are ultimately realized due to a manager's decision.

### Factors Affecting the Manager's Decision-Making Process in the Context of Cost Stickiness

While making a decision, the manager decides under the influence of some characteristics. Whether the manager is optimistic or pessimistic will significantly differ in approach, especially when adjusting resources according to demand changes. Optimistic managers are reluctant to reduce resources and more willing to increase resources, resulting in higher cost stickiness (Chen, Kama, & Lehavy, 2015, pp. 6-7). On the other hand, pessimistic managers tend to add only enough resources to meet the current demand when demand increases, but they tend to cut resources immediately in case of a decrease in demand. Therefore, the optimistic approach

leads to more cost stickiness (Rouxelin, Wongsunwai, & Yehuda, 2015, p. 2). The self-confidence of the manager also affects the expectation of future demand. Overconfident managers underestimate the decrease in sales while overemphasizing the increase. Therefore, they may be reluctant to cut costs when sales fall. It again results in more cost stickiness (Chen, Gores, & Nasev, 2013, p. 11).

Another factor affecting the expectations of managers about the future is the macroeconomic conditions in the country. During periods of economic contraction, demand decline is more likely to continue than during periods of economic growth. Conversely, during periods of economic growth, managers are less willing to cut back on resources. It results in more cost stickiness (Rouxelin, Wongsunwai, & Yehuda, 2015, p. 12).

The sales volume in the previous period also affects the expectations of the managers. If the last period's sales are high, the manager will be optimistic about the sales in the future; otherwise, he will show a pessimistic approach. As stated earlier, optimism will increase the desire to acquire additional resources if sales increase and the desire to retain unused resources when sales decrease. Pessimism will have the opposite effect (Banker, Byzalov, Ciftci, & Mashruwala, 2014, p. 1).

The total benefits that managers receive (tangible returns such as salaries and bonuses and intangible returns such as social status) are often directly proportional to business size, measured by total assets, sales, or market share. Therefore, managers may tend to control more assets by excessively increasing firm size or holding unused resources. In this way, the managers may establish their empires. (Bing, 1998, p. 321).

Another factor is the manager's tenure. People who have held leadership positions for a long time will have more time to form coalitions and increase their power. It will be easier for them to put their interests first by influencing the board of directors or other stakeholders.

The possible length of time managers plans to stay in business in the future also influences the behaviour of empire building. For example, a manager who will retire or quit soon will not try too hard to control resources (Chen, Lu, & Sougiannis, 2012, p. 256-257).

The manager, rewarded according to short-term performance criteria, will immediately try to adjust the resources according to the demand in case of a decrease in demand. Thus, they will be able to get rid of unused resources and show more short-term financial success. In this case, the manager will act parallel with the activity changes, thus reducing the cost stickiness. Managers rewarded for long-term performance, on the other hand, will care less about short-term results, so they will not react to changes in activity by quickly adjusting resources. These managers delay making resource adjustments until their choices become such that they undermine their long-term rewards. It causes cost stickiness (Weijden, 2013, p. 17).

The higher the equity-based pay ratio (equity option, various stock programs) in the total remuneration of executives, the higher the likelihood of cost stickiness. With equity-based payment, the manager's success is matched with the long-term success of the business, and it promises a long-term reward to the manager. In such a situation, the manager's interests are in line with the interests of the shareholders (Brüggen & Zehnder, 2014, p. 188). In addition to these factors affecting the manager's decision-making process, decision-making styles are also likely to affect cost stickiness.

### **Decision-Making Style**

*Decision making* is defined as the act of choosing an alternative from a set of alternatives (Griffin, 2013, p. 240). Various researchers (Harren, 1979; Scott & Bruce, 1995; Allinson & Hayes, 1996; Epstein, Pacini, Denes-Raj, & Heier, 1996) have identified different categories of decision styles. Scott and Bruce (1995) used the career development and professional behaviour literature to develop a scale of decision-making styles. In their study to develop a scale, researchers

defined *decision-making style* as the learned, habitual response pattern an individual display when faced with a decision situation (Scott & Bruce, 1995, p. 820). They derived four decision-making styles from previous research and theories: rational, intuitive, avoidant, and dependent. The spontaneous decision-making style emerged from factor analysis and was added to decision-making styles as a fifth style.

These decision-making styles and their main features are as follows: (Scott & Bruce, 1995, pp. 820-823):

- The rational decision-making style is characterized by, with extensive exploration and rational evaluation of alternatives,
- The intuitive decision-making style is characterized by relying on intuition and emotions.
- The dependent decision-making style is characterized by seeking advice and direction from others.
- The avoidant decision-making style is characterized by attempts to avoid making decisions.
- The spontaneous decision-making style is characterized by a sense of urgency and a desire to complete the decision-making process as soon as possible.

### **Methodology of the Research**

This section explains the purpose, scope, method, model, hypotheses, and findings of the empirical research on SMEs in the Ordu region.

### **Purpose of The Research**

As far as research has been done, no study has been found in the literature that tests whether the financial statement figures of SMEs support the theory of cost stickiness.

It is thought that the probable reason for this is that small-scale enterprises do not have to present their financial statements to the public, so it is not easy to access the financial statements of these enterprises.



In this context, the primary purpose of this study is to analyze the data on sales revenue and cost items related to sales of SMEs with the help of the ABJ model in terms of cost stickiness. In addition, it is also among the aims of the study to reveal whether the detected cost stickiness continues in the years after it emerged, and if it continues, how the stickiness level changes. Another aim of the study is to determine the decision-making styles of the managers who make investment decisions in these enterprises. As a result, the cost stickiness in the enterprises in the sample can be interpreted in terms of the managers' decision-making style.

### **Scope and Method of the Research**

In line with the research purpose, the data were obtained from SMEs operating in the province of Ordu and keeping accounts on the balance sheet basis. In selecting the enterprises to be included in the research, the criterion of operating uninterruptedly between the years 2010-2020 was considered. As a result, the data of 70 enterprises suitable for the desired qualifications were reached, research was carried out on these data. By the study's aims, a questionnaire including the scale of decision-making styles was applied to the senior managers of each business.

In generating the data set for stickiness, the financial statements obtained from the managers of the appropriate enterprises were taken as the basis. Thus, a panel data set covering 770 observations and 3080 financial statement figures for the 11 years of 70 enterprises was used in the research. In the study, panel data analysis, which is the most appropriate analysis method for the data set, was chosen.

In addition, the fact that the time series is equal for all 70 enterprises shows that the data set is balanced panel data. For this reason, the balanced panel data analysis method and fixed or random-effects model were used in the panel data definition.

### **Research Hypotheses**

The hypothesis that costs will exhibit an asymmetrical behaviour against increases and decreases in sales, unlike traditional cost behaviour, was first tested on SG&A

costs. Later studies tried to measure whether this hypothesis is also valid for cost variables such as cost of sales, total operating costs, etc., which are related to production.

More precisely, some studies on cost stickiness apply the ABJ model in its original form, focusing only on the sticky behaviour of SG&A costs, while some studies adapt ABJ's approach to other cost categories or use more comprehensive cost definitions. These analyzes reveal whether other cost types are also affected by cost asymmetry. Adapting sticky cost analysis for additional costs is also essential to eliminate potential distortions due to allocating costs to different categories.

Many studies show that cost stickiness is not limited to SG&A costs but also applies to different cost variables in various contexts. Based on these approaches, the first of the main hypotheses of the research are as follows:

*H<sub>1</sub>*: The response of SMEs costs related to sales to increases and decreases in sales revenue is different. So the costs associated with sales are sticky.

The sub-hypotheses created by adapting the cost variables related to the sales revenue of the enterprises to the *H<sub>1</sub>* hypothesis are as follows;

*H<sub>1a</sub>*: The response of the cost of sales (CS) variable to an increase in the sales revenues of the enterprises is greater than the response to a decrease of the same magnitude in the sales revenues. So, the cost of sales is sticky.

*H<sub>1b</sub>*: The response of marketing, sales, and distribution (MS&D) expenses to an increase in sales revenues of enterprises is greater than the response of the same magnitude to a decrease in sales revenues. So marketing, selling and distribution expenses are sticky.

*H<sub>1c</sub>*: The response of enterprises to an increase in sales revenues of general administration (GA) expenses is greater than the response of the same magnitude to a decrease in sales revenues. So overall administrative costs are sticky.

Anderson, Banker, & Janakiraman (2003) mainly focus on proving that costs are sticky, and they try to measure whether this stickiness in costs continues at the same level in the periods after the decrease in sales. They aimed to determine how managers respond to a decrease in sales. When there is a decrease in sales revenue, managers often do not act immediately, thinking it is temporary. In other words, they wait for a certain period to reduce their resources and costs.

When they are confident that the decline in demand will continue, they begin to reduce their resources. For this reason, the authors predicted that the level of cost stickiness would be lower in the years following the decrease in sales revenue compared to the first year.

Anderson, Banker, & Janakiraman (2003, pp. 55-56) find less cost stickiness when basic accounting data is measured for one year. A more extended observation period should be associated with more excellent knowledge of the continuation and causes of the decline in demand and lead to more appropriate adjustment decisions. The second primary hypothesis of the study developed from this point of view is as follows;

*H<sub>2</sub>*: In the year following the period of decrease in sales, the level of cost stickiness decreases.

When the *H<sub>2</sub>* hypothesis was adapted to the cost variables that the study focused on, the following sub-hypotheses emerged:

*H<sub>2a</sub>*: In the years following the period of decrease in sales, the stickiness level of the CS item gradually decreases.

*H<sub>2b</sub>*: In the years following the decline in sales, the stickiness level of MS&D expenses gradually decreases.

*H<sub>2c</sub>*: In the years following the decline in sales, the stickiness level GA expenses gradually decreases.

### **The Models and Scale Used in the Study, the Variables Considered**

The ABJ model used by Anderson, Banker, & Janakiraman (2003, p. 52) in the first empirical study that brought the concept of cost stickiness to the literature was introduced in the theoretical part of the study. In the related research, the authors stated that this model is suitable for measuring the response of SG&A costs to a change in sales revenue and the difference between periods when sales increase and decrease. Hence, in many later studies, the ABJ model was tested on different cost components and businesses in different countries. In this study, the ABJ model was used to test the hypotheses described above. The model was adapted to the cost variables included in the research hypotheses. As a result, the three main models created from three separate dependent variables are as follows;

$$\text{Model 1: } \log \left[ \frac{CS_{i,t}}{CS_{i,t-1}} \right] = \beta_0 + \beta_1 * \log \left[ \frac{SR_{i,t}}{SR_{i,t-1}} \right] + \beta_2 * \text{Decrease\_Dummy}_{i,t} * \log \left[ \frac{SR_{i,t}}{SR_{i,t-1}} \right] + \varepsilon_{i,t}$$

$$\text{Model 2: } \log \left[ \frac{MS\&D_{i,t}}{MS\&D_{i,t-1}} \right] = \beta_0 + \beta_1 * \log \left[ \frac{SR_{i,t}}{SR_{i,t-1}} \right] + \beta_2 * \text{Decrease\_Dummy}_{i,t} * \log \left[ \frac{SR_{i,t}}{SR_{i,t-1}} \right] + \varepsilon_{i,t}$$

$$\text{Model 3: } \log \left[ \frac{GA_{i,t}}{GA_{i,t-1}} \right] = \beta_0 + \beta_1 * \log \left[ \frac{SR_{i,t}}{SR_{i,t-1}} \right] + \beta_2 * \text{Decrease\_Dummy}_{i,t} * \log \left[ \frac{SR_{i,t}}{SR_{i,t-1}} \right] + \varepsilon_{i,t}$$

As can be seen, the point where the main models of the study obtained by writing the ABJ model separately for different cost components differ from each other is the dependent variables. Accordingly, Model 1 aims to measure the stickiness levels of CS, Model 2 MS&D expenses, and Model GA expenses. The independent variable is expressed as SR in all models by the basic logic of cost stickiness theory.

The main models of the research provide a basis for testing the stickiness of different cost variables. Proportional and logarithm-based models make it easier to make variable comparisons between businesses and partially resolve the possible heteroscedasticity problem. The estimations cover a wide range of sectors, and there are significant differences between firm sizes within the same industry. Logarithm-based models also provide an economic interpretation of the prediction coefficients. Because when the SR increases and the Decrease\_Dummy variable is 0, the  $\beta_1$

coefficient measures the percentage increase in the relevant cost variable against a 1% increase in SR. Likewise, when the SR decreases and the Decrease\_Dummy variable is 1, the sum of the coefficients  $(\beta_1 + \beta_2)$  measures the percentage decrease in the relevant cost variable against the 1% decrease in the SR.

If costs are sticky, the change in costs should be greater when revenue increases than when revenue decreases. Thus, if  $\beta_1 > 0$  in the hypothesis to be tested for stickiness, it will be expected to be  $\beta_2 < 0$  (Anderson, Banker, & Janakiraman, 2003, pp. 52-53). The first three models, which are the main models of the research, were created only by considering the logarithmic transformations of the differences between the current year and the previous year. In other words, these models test the sub-hypotheses of the H<sub>1</sub> hypothesis, that is, whether there is a yearly stickiness with a decrease in SR in terms of the relevant cost variables.

However, as explained in detail in the section where the research hypotheses are introduced, in a year when sales decline for various reasons, resources and costs may not be adjusted immediately. It remains to be seen whether this decline will continue in the following years. From this point of view, to test the sub-hypotheses of the H<sub>2</sub> hypothesis of the research, the following models were created by considering the logarithmic transformations of the differences of the related variables two years ago.

$$\text{Model 4: } \log \left[ \frac{CS_{i,t}}{CS_{i,t-2}} \right] = \beta_0 + \beta_1 * \log \left[ \frac{SR_{i,t}}{SR_{i,t-2}} \right] + \beta_2 * \text{Decrease\_Dummy}_{i,t} * \log \left[ \frac{SR_{i,t}}{SR_{i,t-2}} \right] + \varepsilon_{i,t}$$

$$\text{Model 5: } \log \left[ \frac{MS\&D_{i,t}}{MS\&D_{i,t-2}} \right] = \beta_0 + \beta_1 * \log \left[ \frac{SR_{i,t}}{SR_{i,t-2}} \right] + \beta_2 * \text{Decrease\_Dummy}_{i,t} * \log \left[ \frac{SR_{i,t}}{SR_{i,t-2}} \right] + \varepsilon_{i,t}$$

$$\text{Model 6: } \log \left[ \frac{GA_{i,t}}{GA_{i,t-2}} \right] = \beta_0 + \beta_1 * \log \left[ \frac{SR_{i,t}}{SR_{i,t-2}} \right] + \beta_2 * \text{Decrease\_Dummy}_{i,t} * \log \left[ \frac{SR_{i,t}}{SR_{i,t-2}} \right] + \varepsilon_{i,t}$$

### The scale of Decision-Making Styles

The decision-making styles scale was developed by Scott and Bruce (1995) and consisted of 5 dimensions: rational, intuitive, dependent, avoidant, and spontaneous.

The total number of items on the scale is 25, in a 5-point Likert type. The scale of decision-making styles was applied to the owners or partners of 70 businesses whose data were collected because top management made the investment decisions.

### Reliability Analysis of Scales

The scale consists of 5 dimensions and a total of 25 items. Reliability analysis was performed for each dimension in the scale. As a result of the reliability analysis, it was determined that one item each in the dimensions of intuitive decision making (item 2), dependent decision making, avoidant decision making (item 1) and spontaneous decision making (item 5) decreased the Cronbach Alpha Coefficient of the dimensions. At this stage, the relevant items were excluded from the analysis. The total number of items regarding the dimensions of the scale and the Cronbach alpha coefficients are seen in Table 1.

**Table 1.** Reliability Analysis Results of Decision-Making Scale Dimensions

Dimensions of Scale	Item Number	Cronbach Alpha Coefficient
Rational	5	0,694
Intuitive	4	0,797
Dependent	4	0,561
Avoidant	4	0,668
Spontaneous	4	0,674

Alpha coefficients between 0.40 and 0.60 indicate low reliability, values between 0.60 and 0.80 indicate reliability, and values between 0.80 and 1 indicate a high level of reliability (İslamoğlu & Alnıaçık, 2016, s. 292). According to the findings in Table 1, it was determined that the dependent decision-making dimension was at a low level of reliability, while all other dimensions were at a reliable level. Therefore, a validity analysis of the dependent decision-making dimension was not performed. The primary level confirmatory factor analysis results of the dimensions of Rational Decision Making, Intuitive Decision Making, Avoidant Decision Making, and Spontaneous Decision Making are shown in Table 2.

**Table 2.** Validity Analysis Results of Decision-Making Scale Dimensions

Dimensions	X <sup>2</sup> /df	RMSEA	NFI	CFI	GFI
Rational	,837	,010	,946	1,00	,983
Intuitive	1,340	,068	,978	,994	,983
Avoidant	1,070	,031	,975	,998	,986
Spontaneous	,585	,011	,967	1,00	,988

According to the findings from Table 2, it was determined that the GFI values of all dimensions were acceptable and had good fit values.

### Method

Before the analysis results, it is helpful to give information about what was done during the analysis process. In this context, it is primarily stated that expressing the variables in the research models on a logarithmic basis will increase the comparability between businesses and eliminate the potential variable variance problem.

It facilitates the economic explanation of the model results. Decrease Dummy variable is “0” if there is an equal or increase in sales compared to the previous year, valid for all models; In case of a decrease in sales compared with the year-earlier, it took the value “1”.

All models in the study were estimated using the Least Squares Method. After defining the dependent and independent variables of the model, “Unit Root Tests” were applied for each variable in each sector for which log transformation was made. Accepted unit root tests are Levin, Lin & Chu; Pesaran and Shin W-Stat; ADF-Fisher Chi-Square and PP-Fisher Chi-Square.

As a result of the unit root tests, the null hypothesis “There is a unit root in the panel data” was rejected in all variables. Thus, it has been statistically proven that the panel data to be used does not contain unit-roots.

After the unit root tests, the models with log transformation were analyzed in the Eviews package program. After estimating each model with the Least Squares

Method, it was determined which approach (Fixed effects - Random effects) was suitable for the model using Hausman test statistics.

In Hausman test statistics, the null hypothesis proposes the Random Effects Approach, while the alternative hypothesis proposes the Fixed Effects Approach. According to the Hausman test results conducted for each model, it was decided that the model would be solved according to the Fixed Effects or Random Effects approach.

### Results

After analyzing the relevant models and creating the coefficients, the significance levels of the variables (prob.), the significance of the model (F-Statistics), the autocorrelation measurement values (Durbin-Watson stat.) are presented in the relevant result tables.

The model results testing the primary hypothesis of the research are shown in Table 3.

**Table 3.** Model Results One Year Period

Coefficient Estimates			
(t-statistic)			
	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
	<b>(CS)</b>	<b>(MS&amp;D)</b>	<b>(GA)</b>
$\beta_0$	0.032584 (1.815209)	0.118628 (3.562801)	0.093148 (2.694703)
$\beta_1$	0.807921 (33.67573)	0.286363 (6.377492)	0.292537 (6.332129)
$\beta_2$	-0.017182 (-0.528096)	-0.084736 (-1.344148)	-0.025190 (-0.402057)
Statistics and Economic Measures			
F	901.4892	1.767046	33.00391



Prob (F)	0.000	0.000	0.000
Durbin-Watson	2.673345	2.494370	2.505766

First, as seen in Table 3, it can be said that all models are statistically significant. In addition, the cost behaviour of all cost variables included in the analysis is asymmetrical. In other words, the cost stickiness theory is valid for SMEs covered in the study. However, it would be helpful to express the estimation results of each model separately.

Model 1 is estimated by the change in CS and SR for a one-year period. The predictive value of the  $\beta_1$  coefficient, 0.807 (t-statistic = 33,675), means that for every 1% increase in SR, there is an approximately 0.81% increase in CS. The estimated value of the  $\beta_2$  coefficient, which is -0.017 (t-statistic = -0.528), shows that the magnitude of the CS's response to an increase in SR is not the same as the magnitude of its response to a decrease in sales revenue. It is strong evidence of the cost stickiness hypothesis. The total value of the  $\beta_1$  and  $\beta_2$  coefficients, which measure CS's response to decreases in SR, is 0.790 and means that for every 1% decrease in SR, there is a 0.79% decrease in CS. As can be seen, the response of the CS of SMEs to increases and decreases in SR is not linear, contrary to the traditional cost behaviour assumption. Therefore, for the businesses included in this analysis, CS is sticky, and the  $H_{1a}$  hypothesis is accepted. However, when the stickiness level of CS is considered, it is seen that it is about 0.02%.

Model 2 is estimated by the change in MS&D expenses and SR for a one-year period. Accordingly, for every 1% increase in SR, there is a 0.28% increase in MS&D expenses, while for every 1% decrease in SR, there is a 0.20% ( $\beta_1 + \beta_2$ ) decrease in MS&D expenses. From this point of view, it can be said that MS&D expenses are sticky. In other words, the  $H_{1b}$  hypothesis was accepted for the businesses included in the analysis. The stickiness level is 0.08%.

Finally, Model 3 is estimated by the change in GA expenses and SR for a one-year period. Accordingly, it is observed that for every 1% increase in SR, there is an increase of 0.29% in the GA expenses, while for every 1% decrease in the SR, there is a 0.26% ( $\beta_1 + \beta_2$ ) decrease in the GA expenses. Therefore, it can be said that GA expenses are sticky. In other words, the  $H_{1c}$  hypothesis was accepted. The stickiness level of GA expenses was determined as 0.03%.

As mentioned before, the second primary model of the research was developed to determine the level of cost stickiness in the periods following the year when SR decreased. The study tested whether this situation is valid for SMEs by going back to two periods from the year SR decreased, and the results are presented in Table 4.

**Table 4. Model Results of Two-Year Period**

Coefficient Estimates			
(t-statistic)			
	<b>Model 4</b>	<b>Model 5</b>	<b>Model 6</b>
	<b>(CS)</b>	<b>(MS&amp;D)</b>	<b>(GA)</b>
$\beta_0$	0.062964 (2.732578)	0.260506 (5.642933)	0.148062 (3.232167)
$\beta_1$	0.813940 (34.87098)	0.347092 (7.422055)	0.398661 (9.064201)
$\beta_2$	-0.041996 (-0.891138)	-0.290881 (-3.080749)	-0.020613 (-0.237673)
Statistics and Economic Measures			
F	35.80418	3.514237	66.40195
Prob (F)	0.000	0.000	0.000
Durbin-Watson	1.705797	1.433387	1.342250

Table 4 only shows the estimation results for two periods (two-year period) before the decrease in SR. Table 3, on the other hand, is for the estimation results over a

one-year period. Therefore, only by evaluating the results of these two tables together will meaningfully result regarding the H<sub>2</sub> hypothesis be revealed.

When Table 3 and Table 4 are evaluated together, it is seen that cost stickiness levels have increased in terms of successive periods for cost variables other than GA expenses. In other words, expenses other than GA expenses do not match with the literature. However, it is helpful to explain the evaluations separately for each model.

First, when the Model 1 coefficients in Table 3 and the Model 4 coefficients in Table 4 are examined together, it is seen that the  $\beta_1$  value increased from 0.807 to 0.813, while the  $\beta_2$  value decreased from -0.017 to -0.041 for the combined period increase.

While  $\beta_1$  approaches 1 as expected,  $\beta_2$  moves away from 0 as expected. It shows that the longer the combined periods, the greater the stickiness. In other words, the stickiness level of CS gradually increases in the periods following the decrease in SR. Therefore, the H<sub>2a</sub> hypothesis was rejected.

When the coefficients Model 2 and Model 5 are evaluated together, it is seen that the  $\beta_1$  value increased from 0.286 to 0.347 for the combined period increase, while the  $\beta_2$  value decreased from -0.084 to -0.290. It indicates that the stickiness increases as the combined periods get longer. In other words, the stickiness level of MS&D expenses gradually increases in the periods following the decrease SR, so the H<sub>2b</sub> hypothesis is rejected.

By the coefficients Model 3 and Model 6 are evaluated together, it is seen that the  $\beta_1$  value increased from 0.292 to 0.398, and the  $\beta_2$  value increased from -0.025 to -0.020 for the combined period increase. In particular, the  $\beta_2$  approach to 0 indicates that the stickiness decreases as the combined periods get longer. From this point of view, it can be said that the stickiness level of GA expenses gradually decreased in the periods following the decrease in SR. Therefore, the H<sub>2c</sub> hypothesis was accepted.

Finally, it will be helpful to summarize the research findings to give the results of the hypothesis. The accepted and rejected hypotheses are presented in Table 5.

Table 5. Hypothesis Results

Hypotheses	Accepted/ Rejected
<i>H<sub>1a</sub></i> : The cost of sales is sticky.	Accepted
<i>H<sub>1b</sub></i> : Marketing, selling, and distribution expenses are sticky.	Accepted
<i>H<sub>1c</sub></i> : General administrative expenses are sticky.	Accepted
<i>H<sub>2a</sub></i> : In the years following the decrease in sales, the stickiness level of the cost of sales items gradually decreases.	Rejected
<i>H<sub>2b</sub></i> : In the years following the decline in sales, the stickiness level of marketing, sales, and distribution expenses gradually decreases.	Rejected
<i>H<sub>2c</sub></i> : In the years following the decline in sales, the stickiness level of general management expenses gradually decreases.	Accepted

The mean values, standard deviation values, minimum and maximum values of the decision-making dimensions are presented in Table 6.

Table 6. Findings of the Dimensions of the Decision-Making Scales

Variable	$\bar{X}$	S	Min.	Max.
Rational	4,40	,46	2	5
Intuitive	3,66	,89	1	5
Avoidant	2,21	,78	1	5
Spontaneous	1,70	,60	1	4

As shown in Table 6, the decision-making styles of the managers who made the investment decisions of the 70 businesses are more in line with the rational decision-making style.

Rational decision making is a logical process that includes the steps of: recognition and definition of rational decision-making decision situation; identification of suitable alternatives; evaluate each alternative in terms of its feasibility, satisfaction, and consequences; selection of the best alternative; implementing the chosen alternative and monitoring and evaluating the results of the selected alternative (Griffin, 2013, p. 244).

## **Conclusions**

Since the past, cost behaviour has been one of the most critical topics in cost accounting and cost management. The concept of cost behaviour is a concept used to express the direction and magnitude of the response of any cost element to an increase or decrease in the volume of activity, which is expressed as SR for any reason. Until the late 1990s, the concept of traditional cost behaviour was effective in explaining how costs would respond to changes in sales revenue. Accordingly, if SR increases or decreases by 1 unit, costs also increase or decrease by 1 unit. That is, the relationship between them is symmetrical. However, in the late 1990s and early 2000s, some researchers argued that costs were more likely to respond to an increase in the volume of activity (sales revenue) than to a decrease. This type of cost behaviour is referred to as “sticky” or “asymmetrical”. There are various opinions in the literature about the reasons of asymmetric cost behaviour can be derived from the reasons like managerial discretion of the managers, the business policy, the legal regulations, the unique characteristics of the business, the social and human resources policies, the long-term contracts, and the used capacity of the business. This study tests whether the theory of cost stickiness is valid for SMEs. The analyses were carried out on the data of 70 enterprises operating in Ordu between the years 2010-2020. In the research, the stickiness levels of CS, MS&D expenses and GA expenses were determined based on the ABJ model. In addition, the models were repeated for the period (two-year period) following the period of decrease in SR.

If all research results are evaluated, it is possible to say that the cost stickiness theory is valid for all variables in a one-year period. This result is compatible with the literature. In the two-year period, it was observed that the stickiness level of only GA expenses decreased, while the level of stickiness increased in CM and MS&D expenses items, contrary to the literature. It is thought that this is because small-sized enterprises can not benefit cost management techniques sufficiently, and there is a tendency to reduce the tax base by inflating the costs due to the very high tax rates in businesses in general. In addition, the effect of inflation on costs and the

constant increase in costs such as energy, personnel and rent in Turkey are among the reasons for this situation.

In addition, as a result of the questionnaire applied to determine the decision-making styles of the owners of the enterprises considered in the study, it was seen that the rational decision-making style was dominant. In other words, business managers act logically and rationally by the conditions in their decisions. It can be thought that the rational decision making of the managers is one of the reasons why the stickiness level of GA expenses tends to decrease in the two-year period.

It is a natural result of rational decision-making that managers do not immediately save on costs in the first period when sales decrease but wait for another period and prefer cost reduction if the decrease in sales continues. Also, it is thought that the stickiness level in CS and MS&D expenses did not decrease because the items that make up these expenses are not as open to cost savings as GA expenses. In addition, as a result of rational decision-making, managers may have avoided making a positive contribution to this decrease by reducing their marketing activities in periods when sales decreased. However, this trend of sticking in costs can be examined explicitly with business-based case studies in future studies to make a more precise and detailed determination.

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