

**Does sticky cost represent a distortion of cost accounting principles?  
A critical view of ten divisive issues**

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## Abstract

**Purpose:** This paper arguably discusses the theory and reasoning of sticky cost across ten divisive issues covering the determinants, measurement and utility of cost stickiness classification. The paper shows that several neglected factors in literature impact the elasticity of cost groups such as cost behavior of cost items within cost groups in the short and long term, type of activity of business firms under study, production resources and selling price considerations, and absence of strategic management accounting techniques within business firms.

**Method:** An empirical study posited that describing SG&A expenses behavior as sticky cost as a result of using financial variables, will not differ from the use of physical variables as explanatory variables of this stickiness. Financial and non-financial information for all EGX 100 is extracted from Egypt for Information Dissemination) EGID) for years 2016 to 2020. The final sample included 248 observations for 61 industrial firms. Anderson, Banker, and Janakiraman (2003) model is used in three regression equations to test the combined hypothesis of the research.

**Findings:** Result of the statistical analysis reveals that pricing changes of revenue represent the main cause of cost stickiness behavior and replacing physical variables instead of financial variables may provide different results for many studies that addressed cost stickiness behavior.

**Originality:** The paper develops suggestions of how future research should focus on aligning what is proposed by developed theories in accounting research with basics of accounting principles and the beneficial reflection of such theories in practice on business firms. The paper concludes that cost structure and control in addition to other factors impact the detection of short-term cost management decisions.

**Keywords:** SG&A expenses, sticky costs, asymmetric cost behavior, calculated risk, financial versus physical variables, decision making.

## 1. Introduction

In recent decades, the concept of sticky cost has received the attention of many researchers. Since Anderson, Banker, and Janakiraman (2003) wrote their popular article in 2003 in describing the cost of selling and general expenses as a stickiness behavior, numerous accounting articles have been published to test the stickiness behavior of other cost groups, until these studies revealed the conclusion that all cost groups of a company's cost structure are described as sticky.

The accounting literature that has dealt with the concept of sticky cost has agreed and varied. Priantana and Sayuthi (2020); Ibrahim, Ali, and Aboelkheir (2022) give a review on sticky cost from several aspects with a focus on: the existence of sticky cost, determinants of cost stickiness, and consequences of cost stickiness. Ibrahim, Ali, and Aboelkheir (2022) expand the review of sticky cost to cover: (1) the existence of sticky cost in financial and non-financial firms. (2) the historical development of cost stickiness research. (3) cost stickiness research impact. (4) frequency distributions of theories. (5) frequency distributions of cost stickiness by countries. (6) frequency distributions of cost stickiness articles by cost category.

The agreement of the accounting literature came in confirming the presence of sticky cost concept in the elements of selling, general, and administrative expenses (SG&A) (Anderson, Banker, and Janakiraman 2003, 2007), production costs (PC) (Weiss 2010; Via and Perego 2014), operating costs (OC) (Noreen and Soderstrom 1997; Calleja, Steliaros, and Thomas 2006), and other cost items that can be incurred by businesses (He et al. 2020; Tang et al. 2020). The sincerity of accounting literature results means that the production cost, good of goods sold, operating costs, cost of selling, general and administrative expenses, are all either positively or negatively sticky cost or non-sticky costs. This means that there is no variable, fixed, mixed, scalable, or other cost behaviors among the cost structure components. This is in fact supported by literature itself as showed by Ibrahim, Ali, and Aboelkheir (2022) in their review of 80 studies in literature addressing sticky cost phenomena, there were only 2 articles from the 50 articles reviewed to tackle the determinants of cost stickiness issue, that referred the phenomena of such stickiness to cost structure (behavior),

representing 4% only of pool of factors studied by literature in discovering the causes/determinants of cost stickiness.

This research work aims to examine the truth about the findings of prior accounting literature relevant to the SG&A expenses, production cost, cost of sold goods, the operating cost, and other costs whose behavior is characterized by stickiness, are they really characterized by being symmetry? In the line with this aim, this research work also aims to explore the benefit that can be obtained from classifying SG&A expenses, production cost, cost of sold goods, as well as the operating cost or other costs as a sticky cost, whether in the field of preparing budgets or in the decision-making process.

## 2. Literature Review

The accounting literature that dealt with the measurement of sticky cost are varied, since prior studies differed in the use of the indicator or the proxy by which the sticky cost is measured; First, the selling and administrative cost (SG&A) was used to express the sticky cost (Anderson, Banker, and Janakiraman 2003, 2007; Weiss 2010; Yang 2015; Venieris, Naoum, and Vlismas 2015; Ibrahim and Ezat 2017; Madadian, Aerts, and Caneghem 2018; Cheung et al. 2018; Xu and Zheng 2018; Ciftci and Salama 2018; Zhang, Li, and Wang 2019; Ma, Wang, and Zhang 2019; Liu, Liu, and Reid 2019; Haga, Höglund, and Sundvik, 2019; Chen, Kama, and Lehavy 2019; Cai, Zheng, and Zhu 2019; Stimolo and Porporato 2019; Silge and Wöhrmann 2019; Li et al. 2020; lee, Kim, and Leach-López 2020, Golden, Kohlbeck, and Rezaee 2020; Costa and Habib 2020; Ballas, Naoum, and Vlismas 2020; Lopatta, Kaspereit, Gastone 2020; He et al. 2020).

Second, the cost of goods sold (COGS) was used to express the sticky cost (Weiss 2010; Via and Perego 2014; Banker, Byzalov, and Plehn-Dujowich 2014; Loy and Hartlieb 2018; Yang 2015; Ibrahim and Ezat 2017; Ibrahim 2018; Han, Rezaee, and Tuo 2019; Costa and Habib 2020). Third, the operating cost (OC) was also used to express the sticky cost (Noreen and Soderstrom 1997; Calleja, Steliaros, and Thomas 2006; Balakrishnan and Cruca 2008; Banker, Byzalov, and Chen 2013; Kama and Weiss 2013; Shust and Weiss 2014; Via and perego 2014; Bugeja Lu, and Shan 2015; Zanella, Oyelere, and Hossain, 2015; Holz hacker, Krishnan, and Mahlendorf 2015; Kitching, Mashruwala, and Pevzner 2016; Xu and Sim

2017; Li and Zheng 2017; Bradbury and Scott 2018; Cook, Kieschnick, and Moussawi 2018; Loy and Hartlieb 2018; Li and Zheng 2018; Habib and Hasan 2019; Hartlieb, Loy, and Eierle, 2019; Lee, Pittman, and Saffar 2019; Yang 2019; Golden, Kothbeck, and Rezaee 2020; Golden, Mashruwala, and Pevzner 2020; Wu et al. 2020; He et al. 2020).

Fourth, the operating lease cost (OLC) was used to express the sticky cost (Cook, Kieschnick, and Moussawi 2018; Gray 2020). Fifth, the overhead cost (OH) was used to express the sticky cost (Noreen and Soderstrom 1994, 1997). Last but not least the total costs (TC) were used as sticky cost indicator (Ibrahim and Ezat 2017; Chung, Hur, and Liu 2019; Ciftci and Salama 2018; Rouxelin, Wongsunwai, and Yehuda, 2018; He et al. 2020; Tang et al. 2020).

Accounting literature that tried to find a relationship between sticky cost as a dependent variable or as an endogenous variable and the variable(s) affecting sticky cost as an independent variable or as an exogenous, were numerous. In other words, numerous research studies tried to set the indicators, proxies, factors, or determinants that cause or form sticky costs. The literature that addressed the relationship between the sticky cost and other independent or exogenous variables carries a connotation that is difficult to believe. This connotation is that the sticky cost is the magic stick for solving all past, present, or future cost accounting problems by knowing sticky cost behavior.

### **3. Ten divisive issues of cost stickiness need further investigation**

Despite the numerous accounting literature that addressed the importance of analyzing cost behavior from the perspective of determining the extent of the cost stickiness of a group of cost items that agree in a specific characteristic or group of characteristics; Such as SG&A expenses, cost of goods sold, operating cost, or other items of cost, yet research studies which critically reviewed and analyzed the importance and impact of classifying these groups of cost as being sticky are very few. The literature that dealt with the existence of cost stickiness built its reasoning on a set of characteristics that may distort the results of such reasoning.

### **First: Investigating the behavior of cost item versus the behavior of cost pool**

The analysis dealt with the relationship between a group of combined cost elements and did not deal with the study of each cost element within the group under analysis, as Anderson, Banker, and Janakiraman (2003) analyzed the extent of the stickiness of SG&A expenses, using total SG&A as a total amount neglecting most of the common cost classifications. Prior studies used total SG&A ignoring behavioral cost classification, where costs are classified into variable or fixed cost although such classification represents the core of managerial decision making which is the main output of management accounting information system. Cost items within SG&A differ in their behavior, where this cost includes a set of fixed items; such as the rent of sales building and stores of finished products, and depreciation related to assets used in selling, general and administrative activities, as well as a group of variable items; Such as the salesmen's commission, the cost of sales packaging, and the costs of transporting finished products from the production areas to the warehouses or sale areas. This group also includes the step cost as the cost of the salesmen's supervisors, moreover, this group includes other types of cost such as the mixed cost and others. Moreover, classifying costs as sticky, anti-sticky, or un-sticky can't be utilized in any rational decision making such as make or buy, product mix, outsourcing, or add/drop production line decisions.

Many authors (Horngren, Datar, and Rajan (2012); Atkinson et al. (2012)) stated that, in the traditional model of cost behavior that pervades in the accounting literature, costs are described as fixed or variable with respect to changes in production or sales volume. In this model, variable costs change proportionately with changes in the activity volume. Neither traditional nor strategic cost accounting tested cost behavior of a group of cost, such as SG&A costs, operational costs, cost of goods sold, as a variable or fixed costs, as in the case of cost stickiness. Moreover, Anderson, Banker, and Janakiraman (2003, p 47) stated that "understanding cost behavior is an essential element of cost and management accounting", however, which type of cost the management has to understand its behavior? Does the management have to understand cost behavior for each item of cost or each group of cost classification; variable and fixed cost for example, or total cost for each group as recorded in income statement; COGS, SG&A, OC, PC.

Accounting literature that dealt with the description of expenses such as SG&A, operating expenses, and the cost of goods sold as sticky cost, did not classify the cost items of each group into variable and fixed cost, as required by the basics of cost accounting, Rather, variable and fixed costs in selling, general, and administrative expenses were combined and mixed in one cost pool, and it was plugged in a linear or non-linear regression equation, as if the items of this group were consistent in their characteristics and behavior.

Prior studies used total SG&A as a total amount neglecting cost classification by nature, where costs are classified into material, labor and overhead expenses although such classification represents the cornerstone of cost control process followed by variance analysis. Furthermore, classifying costs as sticky, anti-sticky, or un-sticky can't be used in either performance measurement process or in cost variance analysis.

Using total SG&A as a total amount neglected cost classification by traceability as well, where costs are classified into direct, and indirect costs. Although, this classification represents the main base for allocating costs to units produced or sold in order to get production cost per unit. Furthermore, classifying costs as sticky, anti-sticky, or un-sticky can't be used to calculate cost per unit.

From the author point of view, the maximum benefits the management can get from management accounting system, occurs when management understand cost behavior for each item of cost. Moreover, the benefit the management can get from understanding cost behavior will decrease with more cost items included in the cost group that management needs to understand its behavior. However, cost benefit analysis may limit the ability to understand the behavior of each cost item. Therefore, information economics can play an important role to decide the level of aggregation of cost items will be included in each cost group (Atkinson et al, 2012).

## **Second: Sticky costs; dependent variable versus independent variable in regression equation**

The accounting literature that dealt with cost stickiness with regard to regression analysis came in two directions: First, using a specific group of cost elements to test its cost stickiness as a dependent variable, and this is the common case dealt with by most studies in this direction. Moreover, the factors that influence the occurrence of cost stickiness are tested.

Second, using a specific group of cost elements to test its cost stickiness as an independent variable, where the impact caused by the existence of cost stickiness is examined in this direction.

In the first research group, it was found that the factors causing cost stickiness could come from internal or external forces within/surrounding business firms. Internal forces are represented by factors such as management optimism, overconfidence, incentives for earnings management, avoiding loss (Chen and Lee (2019); Kama and Wiess (2013); Krisnadewi and Soewarno (2019); Hur, Kim, and Cheung (2019); Yang (2015); Xue and Hong (2016)), corporate Governance (Lee, Pittman, and Saffar (2019); Chung, Hur, and Liu. (2019); Xue and Hong (2016)), and firm internal conditions (Mohammadi and Taherkhani (2017); Venieris, Naoum, and Vlismas (2015); Zhang et al. (2019)). External forces causing cost stickiness included factors such as political uncertainty (lee, Kim, and Leach-López (2020)), competitive pressures (Cheung et al. (2018); Krisnadewi and Soewarno (2020), lee, Kim, and Leach-López (2020); Li and Zheng (2017)). It is further observed within this direction where the studies address the drivers of sticky cost, that most of these studies relied on Anderson, Banker, and Janakiraman (2003) model, where sales volume was considered as the main driver of the cost stickiness.

The use of a single driver, sales volume, as a driver for a cost pool, SG&A expenses, comprising multiple items that vary widely in their behavior and characteristics, leads to the same criticism addressed to volume-based cost accounting. The shift from the volume-based cost accounting to the activity-based cost accounting can be mainly attributed to the distortion of cost data derived from the volume-based cost accounting approach, as a result of its use of plant-wide overhead rate.

On the other hand, the second direction of research that examines cost stickiness as an independent variable, presents main opportunities for future research. According to literature, very few articles addressed cost stickiness consequences. Prior research examined the effect of cost stickiness on company dividend policy (He et al. (2020); research and development investment (Cheung, Hur, and Park (2019), earnings management (Da Silva et al. (2019), financial reporting (Hashed (2020); Salehi, Ziba, and Daemi (2018), company and market performance (Lopatta, Kaspereit, and Gastone (2020); Tang et al. (2020); Wiess (2010)), and finally, on auditing price (Kim (2019b), and audit report lag (kim (2019a).



### **Third: The extent to which the company's cost structure is affected by type of company activity**

The empirical studies in the accounting literature that dealt with analyzing the behavior of a certain group of cost from the perspective of its stickiness, through a linear or non-linear regression equation, came mostly based on databases collected from non-financial and financial companies, each of which differs in terms of their cost structure. Regarding non-financial companies, for example, in cement companies, the fixed cost rises at the expense of the variable cost, while in the information technology industries, the percentage of the variable cost rises at the expense of the fixed cost. The inclusion of the regression equation, on the basis of which the behavior of the cost elements is analyzed, for values that differ significantly in terms of their cost structure that varies across firm' industries would lead to results that may be difficult to generalize.

Anderson, Banker, and Janakiraman (2003); extracted their results based on sample of 7,629 firms over 20 years. Yasukata and Kajiwara (2011) tested their hypotheses through all companies that are listed on the Tokyo Stock Exchange as of 2005. Their sample covers the period of 1991 to 2005. They exclude companies in the finance and insurance industries and companies which have not reported their SG&A costs and COGS. Kama and Weiss (2013) built their empirical study based on based on a sample of 97,547 firm-year observations from 1979 to 2006. Shust and Weiss (2014) concluded their empirical evidence based on a sample of 78,803 firm-year observations from 1988 to 2011. Balakrishnan, Labro, and Soderstrom (2014) employed a sample of 132,745 firm drawn from Compustat over the period 1980–2004. Via and Perego (2014) extracted their data from the database AIDA, maintained by Bureau van Dijk, which provides complete financial statements of Italian companies for the last 10 years. They classified their sample into manufacturing industry, 19937, trading industry, 12569, and listed firms, 244, during the period 1999-2008. If the time period of the study is overextended across a long period, and if the diversified and different activities included in the sample are accompanied by a difference in the relative distribution of the cost structure, which in turn does not occur at the same time for all the participants included in the sample, this may be a reason for the difficulty of relying on the results of the statistical analysis resulting from the analysis of the data of the sample.

Reviewing the empirical studies in the accounting literature leads to some questions. Answer to these questions may shed lights on the results' credibility of these studies. First, most of studies used time series analysis, based on that, the question arises: do changes in sales prices and cost of inputs during the time series of each study have the same direction? Second, do changes in sales prices and cost of inputs occur by the same percentage during the time series? Third, does each company maintain the same product mix during the time series? Fourth, does each company maintain the same technology to produce their products? Fifth, does each company maintain the same board of directors or CEO during the time series? Sixth, does each company follow the same corporate governance during the time series? Each of the previous questions may include an indicator or an independent variable (sales price, product mix) in the sticky cost regression equation, or may include a determinant (board of director, corporate governance) of the sticky cost determinants. Anderson, Banker, and Janakiraman (2003) stated that

*“the model used in our study provides the basis for our test of stickiness of SG&A costs. Because the estimation is cross-sectional with a wide variety of industries and large differences in the size of firms, the ratio form and log specification improve the comparability of the variables across firms and alleviates potential heteroskedasticity”.*

Regarding the study of Anderson, Banker, and Janakiraman (2003), the questions are: do wide variety of industries, mean that there is a fundamental difference in the cost structure in terms of the relative distribution between variable cost and fixed cost? Does the difference in the size of the sample participants and the large differences in the size of such firms, also mean that there is a fundamental difference in the cost structure in terms of the relative distribution between the variable cost and the fixed cost? Finally, can a significant variance in the cost structure influence the results regarding the stickiness of the cost under test? These questions can represent the hypotheses or questions of the future research.

#### **Fourth: Economic plausibility of results extracted from regression equation**

The regression model used to determine the extent of the cost stickiness of a given group of cost (SG&A, COGS, OC, Total Cost (TC)) lacks most the economic plausibility criterion. From accounting point of view, still proofs needed to validate the economic plausibility of the regression model that correlates cost stickiness with different set of cost such as: SG&A, COGS, OC, and TC. The reliance of most accounting literature on one main variable, which is the change in sales volume, in testing the extent of the cost stickiness of different groups of cost elements, is surprising. In other words, accounting literature adopted, in testing the extent of the cost stickiness of SG&A expenses, COGS, OC, TC, the change in the sales volume, as if all groups of cost elements, with different ways of classification, depend on the change in the sales volume. The reliance of different cost groups, in which each group includes different types of cost elements that are totally different in their characteristics, on one main cost driver to test its behavior, and in addition destroying many accounting constants, such as the contingency theory, activity-based cost accounting, the balanced scorecard, and ignoring the presence of many other sets of variables, each of which affects a specific cost item or a group of homogeneous cost items within a single cost group, clarifies the need for more evidence to validate the economic plausibility of the regression model results.

#### **Fifth: Classification shifting of business resources (cost items) often distorts results**

Anderson, Banker, and Janakiraman (2003) found evidence of sticky cost behavior of SG&A expenses in large sample of firms from multiple industries. Several studies (Kama and Weiss (2013); Banker, Huang, and Natarajan (2011); Chen, Lu, and Sougiannis (2012)) followed Anderson, Banker, and Janakiraman (2003), who stated that when sales decrease, some *unutilized resources* are retained unless managers make the intentional decision to remove them. However, Anderson, Banker, and Janakiraman (2003) concluded that managers hesitate to remove slack resources when they expect a sales drop to be temporary. The author explores set of inquiries regarding the cost and management accounting treatment of these unutilized resources; What is the cost and management

accounting treatment of unutilized capacity? Does cost or management accounting principles report unutilized capacity as a cost element, therefore, it should be reported as SG&A expenses, OC, PC, COGS, or it should be reported as charges or losses in separate section in the income statement?

The price of unutilized capacity represents resource sacrificed without getting any benefit, therefore, according to the cost and management accounting principles it is not common to report it as a component of SG&A expenses, OC, PC, COGS. In other words, according to the principles of cost and management accounting, these unutilized resources cannot be considered as a cost item that is classified as SG&A expenses, COGS, or any other cost classification. From the author's point of view, the consideration for keeping and maintaining these unutilized resources can be seen as either a loss that is reported in the income statement as activity charges, or as a *calculated risk*, and is not included in the income statement within the SG&A expenses, COGS, or any other cost classification, but it should be reported in a separate section that can be titled Calculated Risk Charges. However, calculated risk can be defined, from the author's point of view as "a carefully studied decision that exposes the company to a degree of financial risk corresponding to the possibility of obtaining future returns that exceed the cost of bearing these risks".

Assuming that what is meant by resources in the framework of Anderson, Banker, and Janakiraman (2003) is production resources as raw materials, or requirements of sales and marketing as packaging materials. The question that can arise in this context is: Does the firm's retention of some extra production or marketing resources, during the period of low demand, mean that the cost of purchasing these extra resources is reported in the SG&A expenses, COGS or any other cost classification. It is known, according to the basics of cost and management accounting, that maintaining production or marketing resources, without the actual effective use of these resources, does not represent the event of causing the cost. Therefore, the company's retention of some economic resources during periods of temporary demand shortage, it must be recorded as an inventory that should be reported in the balance sheet and not the income statement that includes SG&A expenses, COGS or any other cost classification.

Furthermore, if the company retains some of employees during the period of low temporary demand for the company's products, given the difficulty of rehiring such type of labor, or the high cost of rehiring these employees- according to the cost-benefit analysis, given that the cost of rehiring these employees is greater than the cost of retaining these employees during the period of low demand- during the period of increased demand for the company's products. In this case, there is a need to search for the proper cost and management accounting treatment for the charges the business has to carry for maintaining these extra employees. From the author's point of view, the cost of retaining these employees, during a period of temporary low demand for the company's products, represents a calculated risk, and the proper cost and management accounting treatment must be sought for how to report this cost in the financial statements.

The lack of clear definition of what is meant by the term resources in the previous literature that dealt with the concept of sticky cost, makes this concept comprehensive and general that it is difficult to analyze or study its details. Moreover, the basis on which the idea of the sticky cost exists, although it could be accepted before the sixties of the last century, is that the company differentiates between the *burdens* of maintaining the economic resource during the period of low demand for products, and the cost of recovering these resources during a period of increased demand for products again, in this context, this trade-off ignores many of management accounting innovations. If it is assumed that the company differentiates between the burdens of maintaining production requirements of materials during the period of low demand for the company's products, and the high cost that the company can bear to obtain these necessary requirements in the event of increased demand for products, this assumption or trade-off completely ignores the importance of supply chains and company relationships with suppliers, both of which are core of management accounting innovations.

Moreover, it must be taken into consideration when testing the relationship between SG&A expenses and sales volume, that the sales volume is the result of multiplying the sales quantity of each product of the product mix that the company offers to its customers by the selling price of each product of this product mix. The results of testing the regression relationship between SG&A expenses and sales volume in describing the behavior of SG&A expenses as a behavior characterized by sticky or non-sticky or

other cost behavior, is primarily due to the degree of change in sales volume, which may not result from the change in the quantity of sales, but rather this results from the change in the price of each product of the product mix offered by the company, which means that there is an external variable represented in the selling price that is the main reason for describing the cost behavior as sticky or other behavior.

In other words, the behavior of SG&A expenses can be described as sticky behavior, if the rate of increase in SG&A inputs is greater than the rate of increase in sales volume. However, this relationship can also be traced back to the result that the change in the prices of the SG&A inputs - the prices of packaging materials, the prices of fuel used in transporting finished products, whether from production areas to storage and sales areas, or from sales areas to customers- is greater than the change in selling prices of the products offered by the company. On the other hand, the behavior of selling expenses can be described as un-sticky behavior, if the rate of increase in SG&A inputs is less than the rate of increase in sales volume. In any case, this relationship can also be traced back to the fact that the change in the prices of the inputs of SG&A is less than the change in the selling prices of the products offered by the company.

The statement that prices change is either decreasing or increasing during the time period has no effect on the results of the study, is questionable. In other words, some might argue that the effect of the changing in prices of the product mix as well as the prices or costs of economic resources needed to produce this product mix disappears, as a result of including the impact of the changing in prices on both sides of the sticky cost regression equation; The effect of the change in the prices of the economic resources consumed in the SG&A activities, i.e. SG&A expenses as a dependent variable, disappears with the change caused by the volume of sales as a result of the change in prices; as an independent variable in the sticky cost regression equation. The variation between prices in the selling prices of the products and the prices of the economic resources consumed in the SG&A activities are often not the same, and therefore the discrepancy in price rates on both sides of the attached cost regression equation may be a significant reason for the emergence of the result that the SG&A expenses represent a sticky cost.

### **Sixth: The impact of time series length on the company's cost structure**

There is a consensus in the accounting literature that the behavior of cost is determined in light of the relationship between the cost item changes and the change in the volume of production or in light of the change in the cost driver(s). However, if the cost per unit is a function of the quantity of the cost driver or the quantity of the economic resource needed to produce one unit and the unit price of the economic resource, a distinction needs to be drawn between a change in cost behavior over the short term and a change over the long term. During the short term and during the time required to produce a specific batch, it can be said that the quantity of the resource needed to produce one unit, as well as the price of this economic resource is characterized by stability or fixed, which is fully consistent with the principles of cost accounting, where variable cost per unit is stable in the short term.

On the other hand, over a long time series, it is difficult to say that the per-unit variable cost is fixed. The reason is simply that with the long term of time, technological developments appear in production methods may lead to a reduction in the share of one unit of the economic resource needed, and the same applies to the unit price of the economic resource used to produce one unit of the product. Therefore, during a long time series, the change in cost cannot be traced back to the volume of production or the change in the cost driver(s), but is due primarily to the change in the price of the economic resource needed to produce one unit and may also be due to the difference in the amount of economic resource needed by one unit of the product.

Cooper and Kaplan (1998, p 341) stated that the behavior of SG&A costs can be meaningfully studied in relation to revenue activity because sales volume drives many of the components of SG&A, furthermore, Anderson, Banker, and Janakiraman (2003, p 48) stated that "SG&A costs made up 26.4% of sales revenue for our broad-based sample of 7,629 firms over a 20-year period. We test for sticky cost behavior by estimating an empirical model that relates changes in SG&A costs to contemporaneous changes in net sales revenue".

From the author's point of view a broad sample of 7,629 firms and a 20-year period are quite enough to distort the result of statistical analysis. Broad sample means different types of business, different sizes, different strategy, difference in the degree of trend towards the digital transformation. All these differences would lead to different cost structure, and as a result different cost behavior will be extracted from this sample. To exclude the influence of different type of industry on cost behavior, the population of the study should be divided into groups; each group includes one industrial activity, or a group of similar industries, provided that the data of each group is analyzed separately from the other groups. Furthermore, each pre-determined industrial group should be divided according to the size of the business. Several accounting literatures have discussed the variance of results across companies of different sizes. Moreover, for a more objective and in-depth analysis of the concept of the sticky cost and a better homogeneity of results, each industry should be categorized into small and medium-sized companies on the one hand and large companies on the other hand.

Moreover, the length of the time series, 20 years, in light of the trend of product prices to change up and down - as a result of changing energy prices globally, for example - may be represent a sufficient justification for the different behavior of the cost elements within the sample due to the different prices of the products offered by each company, in addition to the difference in the quantity of sales for each participant of the sample. To avoid result distortion that comes as a result of changing price during the time period of the study, either an appropriate index number which suits the products that the business offer is used, or the units sold for each product as an alternative of sales revenue can be utilized. With the increase in the length of the time period under study, the selling prices of products play a relatively large role in distorting the analysis of cost behavior, and to confirm this, assuming that the units sold during the fiscal year (n) is equal to the units sold for the same product during the financial year (n + 1), but the price of product increased during the year (n + 1). In this case, the cost behavior is determined in the light of the change in the selling price of the product or products included in the study and is not at all due to the changes in the quantity of sales or production.



The abstraction of the sales revenue from the effect of the change in the selling prices of the product during the study's time series, can be done through two methods. The first method, substitution of the sales quantity instead of the sales revenue, which can be calculated if it is possible to obtain selling prices for each of the products offered by the business. The second method, the use of index numbers, which is intended to provide a simple way of representing changes over time. Each value is expressed as a percentage of a base value which is the value that occurred in a base period. In addition to the previous questions, the following question can be added: If the sales quantity was used instead of the sales revenue in the sticky cost regression equation, would this lead to a discrepancy in the results of the statistical analysis. It seems to the author that the results of the statistical analysis of the regression equation will differ as a result of substituting the sales quantity instead of the sales revenue or as a result of fixing the selling prices of products by using index numbers.

### **Seventh: The impact of economic variables on company's acquisition of scarce resources and not on the use of such resources**

Regarding the variation in the degree of stickiness, Anderson, Banker, and Janakiraman (2003, pp. 50, 51) stated that "the lower the expected adjustment costs relative to the costs of moving unused resources, the more managers will reduce the resources allocated, resulting in less stickiness." Anderson, Banker, and Janakiraman (2003) statement has been supported by many accounting literatures, despite the varying economies of the countries in which these literatures were applied. In this context, the author indicates that if the unused resources in Anderson, Banker, and Janakiraman study are related to employment, the degree of unemployment in the country under study plays an important role in deciding between the retention of employment during the period of low demand for the company's products, and the decision to lay them off. Furthermore, in the trade-off between the decision to retain a group of employees and the decision to lay them off during the period of low demand for the company's products, the quality and skill level of these employees also plays an important role in this decision, therefore the management directs

its decision towards retaining employees if the company's activities require a specific quality and skill of employees difficult to provide.

On the other hand, if the unused resources are production requirements of materials, the degree of inflation and the trend of inflation up or down is also a fundamental variable in the management's decision in the trade-off between keeping additional stock quantities of production requirements and keeping the quantity that suffices the requirements of demand. The author points out that global security stability and the possibility of wars, especially between major countries, which is confirmed by the current war between Russia and Ukraine, plays a strategic role in the prices and availability of production requirements, and then in the management's decision to keep inventories of material requirements regardless of the prices.

The decision to keep the employment during the period of low demand for the company's products and the decision to lay them off, and the decision to keep the maximum inventory of materials during the period of low demand for the company's products, and the decision to reduce the inventory, are both affected by external forces beyond the control of business firms' management. Global security and the possibility of wars can be considered among the basic determinants of the company's cost structure, and despite the varying unemployment rates, inflation rates, and the economic and security situation of the countries subject to these studies, yet, the results of these studies were nearly identical.

Finally, the author points out that describing cost behavior as sticky or other behavior that can characterize the behavior of cost, depending on sales volume and sticky cost data (SG&A, COGS, OC, TC) may be difficult to be determined or confirmed due to ignoring many factors in the regression equation, for the relationship between sticky costs as dependent variable and sales volume as an independent variable, such as: trend of product prices, the prices of the resources used to perform the business's activities; material, labor, and overhead, the trend of inflation and other economic variables, and the global security. Therefore, it becomes more difficult to explain this relationship between sticky cost and sales volume the longer the time period during which the cost behavior is determined and analyzed.

### **Eighth: Overlooking the role of SMATs in controlling cost stickiness**

To keep pace with the ongoing changing highly competitive business environment, companies should adapt to such forces as information technology applications and the trend towards digital transformation, intense market competition, changing regulations and laws, uncertainties characterizing global markets and economies, and the challenging trade-off between quality and its cost. As firms control and manage its costs and time, efficiently use its resources, and meet quality expectations of their stakeholders, it guarantees its sustainable performance and growth in the business market.

Over the last decades, and in accordance to most accounting research literature, cost stickiness concept is determined to challenge the fundamental assumption that cost behavior is symmetric for activity increases or decrease. Prior studies indicated that cost stickiness concept occurs mainly due to managerial discretion, and management's estimates of the future that could confront the company, which were the main reasons for the asymmetry of cost behavior in response to changes in the level of activity (Bugeja, Lu, and Shan (2015); Cannon (2011), (2014); Jin and Wu (2021); Yunaz and Sasongko (2018)).

Cost management is an essential tool for business firms seeking sustainable competitiveness in market. Cost management techniques guarantee better understanding of cost behavior and structure, precise measurement of cost, and proper allocation of costs to units produced and sold. Although massive number of research studies had been directed to discuss strategic management accounting techniques SMATs and their positive impact on cost control system and firm performance, yet very few studies discussed the role of SMATs in overcoming cost stickiness by providing information that enables managers to have strategic attitude and manage costs in alignment with firm strategy. The question is how can SMATs enable managers to properly calculate cost stickiness and accordingly make better rational decisions.

Since mid-80s and SMATs have been considered in literature as management's pattern that enables firms to be competitive whether by specifying resources consumed by each activity, and thus precisely determines the cost of each activity and in turn activities cost are better allocated to units produced and sold (ABC). Or by preventing accumulation of resources (inventory) in warehouses by adopting production process based on volume of demand or orders received by customers (JIT). Or by determining costs according to set product prices and expected profit margin (target costing). Or by eliminating any item, during the whole product life cycle from design to implementation, that cause unjustified costs of no value to the product (value engineering) (Nikbakht and Daylami, (2013); Fakharian (2003); Darabi (2008); Apak et al. (2012)).

Ignoring the role of SMATs in controlling cost stickiness is just another documentation of the gap between accounting theory and the real practical needs of business firms, since high adoption rates of traditional management accounting techniques (TMATs) in business firms at the expense of SMATs had been the focus of some researchers (Rashid, Ali, and Hossain (2021); Guilding, Cravensf and Tayles (2000); Cadez (2006)).

### **Ninth: Extent to which decision makers benefit from the results of sticky cost research**

A question about the extent to which managers and decision makers benefit from the results of research that dealt with cost stickiness. From the author's point of view, the results will not be good enough, if a survey is made to show the extent to which managers and decision-makers, in the companies that were addressed by the research related to sticky cost, benefited from the results of these researches, and the extent of benefiting from the findings of these researches in the fields of management accounting; whether in terms of cost measurement and control, or in terms of benefiting from these results in preparing the planning budgets, or in the field of making managerial decisions, and finally, in the field of performance measurement.

Jensen (2018, p. 1486) stated that "*Although management accounting tools and techniques are developed to solve practical problems in organizations, there is a lot of criticism of management accounting research for not having an impact on practice*". Bromwich and Scapens (2016. p. 2) argued that "*it seemed clear that there was 'a gap between theory and practice'*".

*Furthermore, it did not seem likely that this gap could be explained by a time lag between developing theoretical ideas and diffusing them in practice. It is fair to say that, at the time, we knew relatively little about management accounting in practice. The general view seemed to be that organizations used the traditional tools and techniques, such as overhead allocation, budgeting, and standard costing.”* However, there are many accounting writings that dealt with the gap between theory and practice in the field of managerial accounting (Hamadi and Fournès (2022); Kaplan (1998, 2011); Laughlin (2011); Short et al., (2009); Lucas and Rafferty (2008); Shapiro et al., (2007)).

To bridge the gap between the accounting literature and research and the practical application of management and cost accounting practices, researchers must ask themselves at least three questions, first before conducting research, to what extent the practical reality benefits from the results of this research? Second, after completing the research, has the desired practical benefit from this research been achieved? Third, to what extent did the research contribute to solving any of the problems that business firms suffer from? If the answer to either of these three questions is that the research results do not serve the practical practices of cost and management accounting, this accordingly means an increase in the gap between accounting literature and accounting practices.

However, cost benefits analysis should be considered in order to minimize the gap between theory and practice. Cost is represented by effort, time, and money consumed to conduct the study or the research, while benefits are represented by the return that the population of the study received from applying the results of the accounting research or study. Therefore, to minimize the gap between theory and practice the practical benefits of research or study's application should be touched by business firms.

In this context, pilot survey may contribute, as one of the important research tools, to bridge the gap between theory and practice, by directing a questionnaire that clarify the idea of the research work to be started, and the extent to which the research work population benefits from the results of this research work. As in cost accounting, if the enterprise's resources are sacrificed without obtaining a return or benefit as a result of using these resources, the cost of these resources represents a loss, which must be reported in the income statement in the part of the activity charges. The same is true in the field of accounting research, as the results of research

and studies, if they do not have a reflection on ground on the practices of business firms, the time and effort, and then the cost of such accounting research represents a loss.

### **Tenth: Anderson, Banker, and Janakiraman cost research versus Horngren, Foster, and Datar; Hilton; and others**

Despite of Anderson, Banker, and Janakiraman (2003, pp 61-62) claim when they stated that

*“Textbook treatments of cost behavior recommend methods such as regression analysis to estimate the average amount of the change in costs associated with a unit change in the activity driver (e.g., Hilton [1997, pp. 312–15], Horngren, Foster, and Datar [1999, pp. 338–39]). Making such estimations without considering sticky costs leads to underestimation of the responsiveness of costs to increases in activity and overestimation of the responsiveness of costs to decreases in activity. Similarly, instructions for flexible budgeting indicate that budgeted costs should be flexed symmetrically for both positive and negative differences between the actual and initial budget quantity (e.g., Hilton [1997, pp. 526–30], Horngren, Foster, and Datar [1999, pp. 222–24]). Such methods are likely to cause distortions in managerial decisions based on cost analyses.”*

However, the textbook of Horngren, Foster and Datar (2007, 2008, 2011, 2014), which is the most accepted and widely used as a textbook for students and may be for postgraduates in the Arab Republic of Egypt, totally ignored Anderson's criticism of the need to take into consideration the sticky cost behavior when estimating cost elements or when making budgets' numbers. This may mean that the importance and role of the sticky cost in decision-making has not been realized by the most pioneers managerial accounting scientists and authors. In his following editions, Hilton followed the same approach as Horngren, Foster, and Datar in ignoring the concept of sticky costs when estimating cost behavior or when making managerial decisions.

#### 4. Research hypotheses

The description of SG&A cost behavior as a sticky cost as a result of using financial variables (Sales revenue or salaries), is not different from the use of physical variables (sales quantities, number of employees) as independent or explanatory variables of this stickiness behavior. This argument is based on the first divisive issue stated in section (2). Accept or reject that the reason for the sticky behavior of SG&A expense is primarily due to the reliance on financial variables for the explanation of sticky behavior, which is significantly affected by changes in input prices, rather than using physical variables for proving stickiness behavior of SG&A expense. This argument can be proved through the following three hypotheses.

H<sub>1</sub>: The stickiness behavior of SG&A cost shows positive coefficient of the natural logarithm of dividing the current year's sales by the previous year's sales (financial variables); as an explanatory financial variable, and the negative coefficient of the natural log of the likely artificial variable multiplied by the result of dividing the current year's sales by the previous year's sales.

H<sub>2</sub>: The stickiness behavior of SG&A cost shows positive coefficient of the natural logarithm of dividing the current year's salaries by the previous year's salaries (financial variables); as an explanatory financial variable, and the negative coefficient of the natural log of the likely artificial variable multiplied by the result of dividing the current year's salaries by the previous year's salaries.

H<sub>3</sub>: The stickiness behavior of SG&A cost shows positive coefficient of the natural logarithm of dividing the current year's number of employees (physical variables) by the previous year's number of employees; as an explanatory financial variable, and the negative coefficient of the natural log of the likely artificial variable multiplied by the result of dividing the current year's number of employees by the previous year's number of employees.

Accept first and/or second hypotheses and reject the third one means that SG&A expenses are characterized by sticky behavior regardless of whether the independent or explanatory variable that interpret the behavior of this SG&A cost is financial or physical. On the other hand, rejecting first and/or

second hypotheses and accepting the third one means that SG&A expenses are characterized by non-sticky behavior, where the stickiness behavior comes as a result of using physical variables as an independent or explanatory variable instead of financial variables.

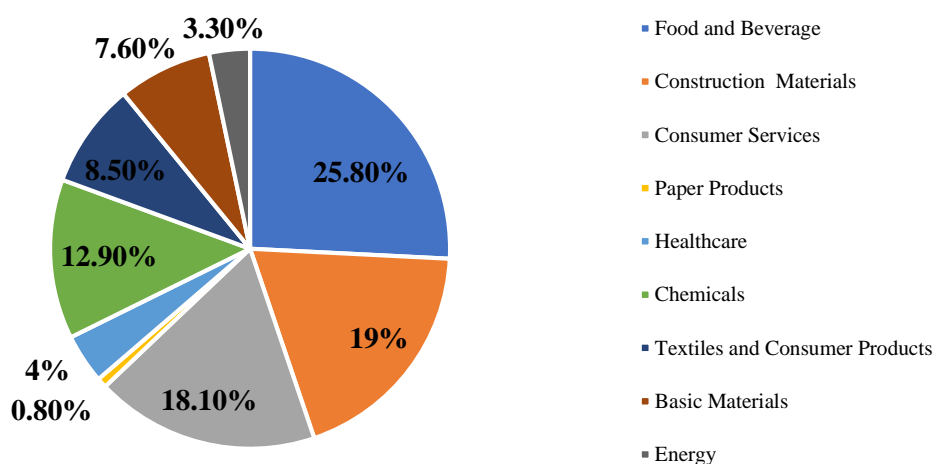
## 5. Sample selection and testing hypotheses

This section addresses both sample and method. Sample includes setting research population and selecting sample from this population. Sample also includes descriptive statistics of the participant that were relied on for testing research hypothesis. Method includes measuring research variables and statistical analysis used to test the research hypotheses.

### 5.1. Sample

Financial and non-financial information for all EGX 100 is extracted from Egypt for Information Dissemination (EGID) for years 2016 to 2020. Business firms within the sample are distributed across 9 different industry sectors as presented by figure (1). Food and beverage, followed by construction materials and consumer services industries represent the dominating sectors of industry within which firms operate. The final sample included 248 observations for 61 industrial firms. The author considered the following criteria for sample selection: (1) All firms are listed in EGX for highest level of transparency in financial reporting, (2) excluding financial institutions to unify nature of activities across the sample, (3) the firms should be listed in EGX 100 for at least 2 years within the period of time covered by the study.

Fig (1): Sample distribution by industry sectors





	N	Minimum	Maximum	Mean	Std. Deviation
SG&A	248	150470	3006275080	301641779.41	520109327.930
Revenue	248	1375000	49161647000	4583538056.83	8907483527.573
Salaries	248	181644	2370718672	240205379.41	363949000.005
Number of Employees	248	8	20783	3015.71	4168.464

Table (1): Descriptive Statistics

## 5.2. Testing hypotheses

Model (1) in Anderson, Banker, and Janakiraman (2003) is applied three times to test the research hypotheses. In the first time, same regression analysis, variables, and method tare used o justify the existence of cost stickiness of SG&A. The main different between the model (1) applied in Anderson, Banker, and Janakiraman (2003) and this research model is the data used whether in terms of length of time period and terms of sample size.

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

Where, log: natural logarithms; SG&A: Selling, General & Administrative expenses; Revenue: Sales Revenue; Decrease Dummy: Dummy Variable;  $\beta_0$ : Constant of regression equation;  $\beta_1, \beta_2$ : Parameters of the explanatory variables included in regression equation;  $\varepsilon$ : Random error in the regression equation,  $i$ , firm;  $t$ : time period.

Anderson, Banker, and Janakiraman (2003) did not show model summary or analysis of variance (ANOVA), but they did show only table of coefficients of regression equation. Following the same methodology of Anderson, Banker, and Janakiraman (2003), table (2) shows the coefficients of the regression equation (1). However, model summary of regression equation (1) shows high coefficient of correlation (0.619), and moderate coefficient of determination (0.383) and adjusted R square (0.378).

Table (2) shows the estimated value of  $\beta_1$  of 0.583 indicates that SG&A expenses increased 0.58% per 1% increase in sales revenues. The estimated value of  $\beta_2 = -0.482$  reveals strong evidence for the cost's stickiness of

SG&A. Moreover, the combined value of  $\beta_1 + \beta_2 = (0.583 - 0.482) = 0.101$  indicates that SG&A expenses decreased by 10% per 1% decrease in sales revenue. Finally, Anderson, Banker, and Janakiraman (2003) point out that the sticky cost is recognized when the following relationship is realized ( $\beta_1 > 0, \beta_2 < 0$ ). Since this relationship is realized within the equation (1);  $\beta_1 = 0.583 > 0$  and  $\beta_2 = -0.482 < 0$ . All these statistical results support the results of Anderson, Banker, and Janakiraman (2003). Therefore, first hypothesis is accepted.

#### Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.018	.010		1.765	.079
Log_Rev	.583	.048	.697	12.070	.000
D_D_Log_Rev	-.482	.131	-.213	-3.681	.000

a. Dependent Variable: Log\_SG\_A

Table (2): coefficients of regression equation (1)

Second hypothesis is tested through making only one adjustment in Anderson, Banker, and Janakiraman (2003). This adjustment is replacing salaries expenses instead of revenues. Based on this adjustment equation (2) test the stickiness of SG&A as a result of change in salaries expense.

$$\log \left[ \frac{SG\&A_{i,t}}{SG\&A_{i,t-1}} \right] = \beta_0 + \beta_1 \log \left[ \frac{Salaries_{i,t}}{Salaries_{i,t-1}} \right] + \beta_2 * Decrease\_Dummy_{i,t} * \log \left[ \frac{Salaries_{i,t}}{Salaries_{i,t-1}} \right] + \varepsilon_{i,t} \dots \dots \dots (2)$$

Where, log: natural logarithms; SG&A: Selling, General & Administrative expenses; salaries: salaries expenses; Decrease Dummy: Dummy Variable;  $\beta_0$ : Constant of regression equation;  $\beta_1, \beta_2$ : Parameters of the explanatory variables included in regression equation;  $\varepsilon$ : Random error in the regression equation,  $i$ , firm;  $t$ : time period. Coefficients of the regression equation (2) are shown in table (3).

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.060	.015		4.046	.000
Log_Salary	.220	.120	.128	1.834	.068
D_D_Salary	-.041	.027	-.105	-1.499	.135

a. Dependent Variable: Log\_SG\_A

Table (3): coefficients of regression equation (2)

Table (3) shows the estimated value of  $\beta_1$  of 0.583 indicates that SG&A expenses increased 0.22% per 1% increase in salaries and wages expenses. The negative sign of the estimated value of  $\beta_2 = -0.041$  reveals evidence for the cost’s stickiness of SG&A. Moreover, the combined value of  $\beta_1 + \beta_2 = (0.220 - 0.041) = 0.179$  indicates that SG&A expenses decreased by 18% per 1% decrease in salaries and wages expenses. Finally, Anderson, Banker, and Janakiraman (2003) point out that the sticky cost is recognized when the following relationship is realized ( $\beta_1 > 0, \beta_2 < 0$ ). Since this relationship is realized within the equation (2);  $\beta_1 = 0.220 > 0$  and  $\beta_2 = -0.041 < 0$ . All these statistical results support the acceptance of the second hypothesis.

Third hypothesis is tested also through making only one adjustment in model (1) of Anderson, Banker, and Janakiraman (2003). This adjustment is replacing numbers of employees as a physical variable instead of revenues which represents financial variable. Substituting the number of workers instead of sales revenue, or in other words replacing a physical variable rather than a financial variable, primarily aimed at excluding the significant effect of price changes to explain the cost-of-sale behavior, Based on this adjustment, equation (3) tests the stickiness of SG&A as a result of change in number of employees.

$$\log \left[ \frac{SG\&A_{i,t}}{SG\&A_{i,t-1}} \right] = \beta_0 + \beta_1 \log \left[ \frac{Number\ of\ Employees_{i,t}}{Number\ of\ Employees_{i,t-1}} \right] + \beta_2 * Decrease\_Dummy_{i,t} * \log \left[ \frac{Number\ of\ Employees_{i,t}}{Number\ of\ Employees_{i,t-1}} \right] + \varepsilon_{i,t} \dots\dots\dots (3)$$

Where, log: natural logarithms; SG&A: Selling, General & Administrative expenses; number of employees: number of employees; Decrease Dummy: Dummy Variable;  $\beta_0$ : Constant of regression equation;  $\beta_1, \beta_2$ : Parameters of the explanatory variables included in regression equation;  $\varepsilon$ : Random error in the regression equation,  $i$ , firm;  $t$ : time period. Coefficients of the regression equation (3) are shown in Table (4).

Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.053	.015		3.439	.001
Log_Number_employees	.124	.104	.080	1.191	.235
D_D_Number_Employees	.005	.024	.014	.216	.829

a. Dependent Variable: Log\_SG\_A

Table (4): coefficients of regression equation (3)

Table (4) shows the estimated value of  $\beta_1$  of 0.124 indicates that SG&A expenses increased 0.12% per 1% increase in number of employees. The positive sign of the estimated value of  $\beta_2 = 0.005$  provide evidence for the absence of cost's stickiness of SG&A. Finally, Anderson, Banker, and Janakiraman (2003) point out that the sticky cost is recognized when the following relationship is realized ( $\beta_1 > 0, \beta_2 < 0$ ). Since this relationship is not realized within the equation (3);  $\beta_1 = 0.124 > 0$  and also  $\beta_2 = 0.005 > 0$ . All these statistical results did not support the acceptance of the third hypothesis.

Table (5) summarizes the results of the three regression equations. Through data reported in table (5) accepting or rejecting the combined hypothesis of the three research hypotheses can be made. *The combined hypothesis of this research is: The description of SG&A expenses behavior as a sticky cost as a result of using financial variables (Sales revenue or salaries), is not different from the use of physical variables (number of employees) as explanatory or interpreted variables of this stickiness behavior.*

Key Variable	SG&A with Revenue		SG&A with Salaries		SG&A with Number of Employees	
$\beta_1$	.583	Positive	.220	Positive	.124	Positive
$\beta_2$	-.482	Negative	-.041	Negative	.005	Positive
Type of independent variable	Financial		Financial		Physical	
Result	Sticky		Sticky		Not Sticky	

Table (5): the results of the three regression equations

The last two lines in table (5) refer to the result of the statistical analysis of the three regression equations, that the SG&A expenses can be described as a sticky cost according to the first and second regression equation, while the third regression equation resulted in the non-sticky behavior of the SG&A expenses. In other words, the statistical results of the three-regression equation reveal without doubt that the SG&A expenses can be described as a sticky cost when using both sales revenue and salaries and wages as explanatory or independent variables, while this stickiness of SG&A expenses doesn't exist when numbers of employees is used as explanatory or independent variable.

As a result of non-verification or rejecting the combined hypothesis, stating that SG&A expenses behavior as a sticky cost as a result of using financial variables, is not different from the use of physical variables as explanatory variables of this stickiness behavior, the alternative hypothesis is accepted. Rejecting the combined hypothesis and accepting the alternative one may reveal that pricing changes of revenue represent the main cause of stickiness behavior. Replacing sales quantity (which could not be extracted from financial reports available to the author) as physical variables instead of sales revenues as financial variables may represent a good chance for more investigation of the cost stickiness phenomenon.

## 6. Conclusion and future research

This study aimed to highlight that prior literature neglected several core factors that impact the elasticity of cost groups such as cost behavior of cost items within cost groups in the short and long term, type of activity of business firms under study, production resources and selling price considerations, absence of strategic management accounting techniques within business firms. For further elaboration of the study cause, an empirical study was conducted on 61 industrial firms operating in Egypt, proposing that describing SG&A expenses behavior as a sticky cost as a result of using financial variables, will not differ from the use of physical variables as explanatory variables of this stickiness behavior. Financial and non-financial information were extracted from for years 2016 to 2020.

Statistical analysis of data revealed that SG&A expenses can be described as a sticky cost when using financial variables such as sales revenue and salaries and wages as explanatory or independent variables, while this stickiness of SG&A expenses doesn't exist when physical variables such as numbers of employees is used as explanatory or independent variable. This result supports one of the ten divisive issues of the study that pointed to the fact that the sales volume is the result of multiplying the sales quantity of each product of the product mix that the company offers to its customers by the selling price of each product of this product mix and that the results of testing the regression relationship between SG&A expenses and sales volume in describing the behavior of SG&A expenses as a behavior characterized by sticky or non-sticky or other cost behavior may not result from the change in the quantity of sales, but rather this results from the change in the price of each product offered by the company, which means that there is an external variable represented in the selling price that is the main reason for describing the cost behavior as sticky or other behavior.

In spite of the multiplicity of accounting literature that dealt with the existence of the sticky cost, which confirmed the existence of the sticky cost in many companies of the different type of activity, studies that dealt with the importance of the study of sticky cost, and the benefit that can accrue to the business as a result of describing the specific cost behavior as a sticky are almost rare. Anderson, Banker, and Janakiraman (2003) pointed out that there is an importance of sticky cost in the field of budgeting and in the field of control, however, they did not explain how to

take advantage of sticky cost when preparing planning budgets, whether fixed or flexible, and they also did not explain how to take advantage of them in the field of cost control.

Previous literature did not explain how to take advantage of the sticky cost in the fields of management accounting; therefore, literature did not provide sticky cost contribution to the four main areas of management accounting; how to take advantage of the existence of the sticky cost in the field of proper cost measurement, or in the field of cost forecasting and preparing planning budgets or formulating cost standards. Furthermore, studies that dealt with the existence of sticky cost did not provide its importance in performance measurement or making decisions.

Ibrahim, Ali and Aboelkhair (2022), and Priantana and Sayuthi (2020) expressed the importance of sticky cost in terms of sticky cost consequences. While Krisnadewi , Niroula and, Singh (2022) expressed the importance of sticky cost in terms of its impact. Ibrahim, Ali and Aboelkhair (2022) in their systematic literature review of 27 years of sticky cost research mentioned three studies which addressed consequences of cost stickiness. Banker and Chain (2006) and Han, Rezaee, and Tuo (2019) revealed positive relationship between cost variability and cost stickiness, and the process of improving the forecast accuracy of future earnings and in providing relevant information content. The third study provided by Rouxelin, Wongsunwai, and Yehuda, (2018) addressed the relation between aggregate cost stickiness and forecasting unemployment. They concluded that periods of great cost stickiness (when companies are reluctant to terminate employees) are followed by a growing number of employees overall.

Priantana and Sayuthi (2020) in their review article of major themes of sticky costs added three more articles that addressed importance of sticky costs. Weiss (2010) concluded that firms with more sticky cost and less earning forecast accuracy do have less analyst coverage and less weak respond to surprises of earning, Kim and Prather-Kinsey (2010) revealed that Analysts 'earnings forecast error positively relates with the growth of sales because of fixed-cost intensity. Banker, Basu and Chain (2015) tested the confounding effect of sticky cost in the conservatism concept, and they concluded that Conditional conservatism should recognize the impact of sticky costs. Ciftci, Mashruwala, and Weiss (2016) investigated the consequences of sticky cost on predictive analysis of earning by using

comparisons between unfavorable conditions compared to favorable conditions of sales shock in equal quantities. Result of their study showed that systematic errors expenses bring about error of earnings forecast in unfavorable rather than in favorable conditions.

Future research may cover other issues, other than the existence, determinants and consequences of sticky cost. Further research may address analyzing cost behavior of cost elements within a specific cost group on the short and long term, tracing cost behavior of business firms' operations in the same industry sector, and observing stickiness of cost with a sample of same-sized firms. In addition, the extent to which there is an accounting impact of sticky cost on strategic management accounting practices, and the need for new management accounting innovation to deal with the implications that this sticky cost can have for management decision-making. Also, different theoretical background (specifically; contingency theory, agency theory, stakeholders' theory) explanations and reasoning for sticky cost research should be further highlighted and studied by researchers.



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**المخلص:**

في العقود الأخيرة، وتحديدًا منذ دراسة Anderson, Banker, and Janakiraman الشهيرة في عام 2003 التي تناولت وصف سلوك المصروفات البيعية والعمومية والإدارية (Selling, General & Administrative (SG&A) بالسلوك غير المتماثل أو المتباين، حظي مفهوم التكلفة غير المتماثلة أو المتباينة السلوك باهتمام العديد من الباحثين. إلا أن هذا الاهتمام بدراسة السلوك المتباين أو غير المتماثل للتكلفة لم تقف حدوده عند المصروفات البيعية والعمومية والإدارية (SG&A)، ولكنها سرعان ما امتدت لتشمل العديد والعديد من مجموعات التكلفة الأخرى. فمن ناحية، تناولت كتابات محاسبية دراسة السلوك المتباين أو غير المتماثل لمصروفات التشغيل (Operating Expenses (OE)، وهي بذلك لا تختلف كثيرًا عن المصروفات البيعية والعمومية والإدارية (SG&A)، حيث يمكن النظر إلى المصروفات البيعية والعمومية والإدارية (SG&A) على اعتبارها المكون الأساسي لمصروفات التشغيل، بجانب مصروفات أخرى؛ كمصروفات البحوث والتطوير (R&D) Research and Development (Noreen and Soderstrom 1997; Calleja, Steliaros, and Thomas 2006; Kothbeck, and Rezaee 2020; Golden, Mashruwala, and Pevzner 2020; Wu et al. 2020; He et al. 2020).

من ناحية أخرى، ظهرت دراسات تبحث في مدى اتفاق سلوك مصروفات إنتاج البضاعة المباعة (Cost of Goods Sold (COGS) مع السلوك غير المتماثل أو المتباين للتكلفة (Weiss 2010; Via and Perego 2014; Banker, Byzalov, and Plehn-Dujowich 2014; Loy and Hartlieb 2018; Yang 2015; Ibrahim and Ezat 2017; Ibrahim 2018; Han, and Tuo 2019; Costa and Habib البيعية (SG&A) (أو التسويقية) قد تكون عاملاً مشتركاً في كل من التكلفة البيعية والعمومية والإدارية (SG&A) ومصروفات إنتاج البضاعة المباعة (COGS)، الأمر يعني أنه استبدال وإحلال لمصروفات إنتاج البضاعة المباعة بدلاً من المصروفات العمومية والإدارية. وعلى ذلك يمكن القول بأن دراسة السلوك غير المتماثل أو المتباين لتكلفة المصروفات البيعية والعمومية والإدارية (SG&A) ومصروفات التشغيل (OE) وتكلفة إنتاج البضاعة المباعة، تتفق جميعها على أنها تتضمن في جانب منها المصروفات البيعية أو التسويقية. دراسة السلوك غير المتماثل أو المتباين للتكلفة، لم يقف عند المجموعات الثلاث السابقة بل امتدت الدراسات المحاسبية لاختبار

مدى توافق سلوك التكلفة الكلية Total Cost مع السلوك المتباين للتكلفة ( Ibrahim and Ezat 2017; Chung, Hur, and Liu 2019; Ciftci and Salama 2018; Rouxelin, Wongsunwai, and Yehuda, 2018; He et al. 2020; Tang et al 2020).

الاتساع التدريجي لدراسة السلوك غير المتماثل أو المتباين للتكلفة، وتضمين وعاء التكلفة محل دراسة سلوكه غير المتماثل أو المتباين لمجموعات متعددة من عناصر التكاليف لأنشطة لا تتفق في طبيعتها أو خصائصها مع بعضها البعض، كان بمثابة الركيزة الأساسية التي قامت عليها فكرة هذا البحث. في إطار هذا البحث تم تناول عشر نقاط جدلية Ten Divisive Issues. النقطة الأولى، هل تهتم المحاسبة عن التكلفة بدراسة سلوك عنصر التكلفة أم سلوك وعاء التكلفة Investigating The Behavior Of Cost Item Versus The Behavior Of Cost Pool. النقطة الثانية، ماهية التكلفة غير المتماثلة أو المتباينة السلوك في معادلة انحدار اختبار السلوك غير المتماثل أو المتباين للتكلفة Sticky Costs; Dependent Variable Versus Independent Variable. النقطة الثالثة، مدى تأثير هيكل تكلفة الشركة بنوع نشاط الذي In Regression Equation The Extent To Which The Company's Cost Structure Is Affected By Type Of Company Activity. النقطة الرابعة، مدى اتفاق معيار المعقولية الاقتصادية على النتائج المستخلصة من معادلة الانحدار Economic Plausibility Of Results Extracted From Regression Equation. النقطة الخامسة، التبويب الخاطئ لبنود التكلفة أو أخطاء القياس تكلفة وعاء التكلفة غالبا ما يؤدي إلى خطأ حساب التكلفة Classification Shifting Of Business Resources (Cost Items) Often Distorts Results. النقطة السادسة، تأثير طول السلسلة الزمنية على هيكل تكلفة بالشركة The Impact Of Time Series Length On The Company's Cost Structure. النقطة السابعة، تأثير المتغيرات الاقتصادية ينصب على حيازة الشركة للموارد النادرة (الأصول) وليس على استخدام هذه الموارد (التكلفة) The Impact Of Economic Variables On Company's Acquisition Of Scarce Resources And Not On The Use Of Such Resources (Cost Assets). النقطة الثامنة، تجاهل دور أساليب المحاسبة الإدارية الاستراتيجية في رقابة التكلفة التي تتصف سلوكها بالسلوك غير المتماثل أو المتباين Overlooking The Role Of SMATs In Controlling Cost. النقطة التاسعة، مدى استفادة صناع القرار بالشركة من نتائج البحوث والدراسات Stickiness التي تناولت مفهوم التكلفة غير المتماثلة أو المتباينة السلوك Extent To Which Decision Makers Benefit From The Results Of Sticky Cost Research. النقطة العاشرة، مدى استجابة Horngren, Foster, and Datar; Hilton; and others للنقد الموجهة من Anderson, Banker, and Janakiraman.

النقاط الجدلية العشرة تم تجميعها من خلال ثلاثة فروض بحثية يمكن دمجها في الفرض التالي: أن سلوك التكلفة البيعية والعمومية والإدارية (SG&A) لا يتصف بالسلوك المتباين نتيجة استخدام المتغيرات المالية دون غيرها من المتغيرات المفسرة أو المستقلة، ومن ثم لن يختلف هذا السلوك المتباين لهذه التكلفة حالة استخدام المتغيرات المادية كمتغيرات مفسرة أو مستقلة. ولاختبار صحة هذا الفرض جاءت الدراسة العملية، والتي تحدد مجتمع الدراسة فيها في المائة شركة الأكثر نشاطا وتداولاً في السوق المصري للأوراق المالية (100 EGX)، وتم الحصول على المعلومات المالية وغير المالية (المادية) لجميع هذه الشركات من شركة مصر لنشر المعلومات (EGID) للأعوام 2016 إلى 2020. وتضمنت العينة النهائية 248 مشاهدة لـ 61 شركة. وللتحقق من صحة فروض البحث تم استخدام إحدى نماذج- نموذج رقم (1)- دراسة Anderson, Banker, and Janakiraman (2003) من خلال ثلاث معادلات للانحدار المتعدد. الأولى، معادلة الانحدار وفقا للنموذج الأول في دراسة Anderson, Banker, and Janakiraman (2003)، حيث المتغير التابع فيها المصروفات البيعية والعمومية والإدارية (SG&A) ، والمتغيرات المستقلة التغير في إيرادات المبيعات، ومتغير ثنائي يأخذ قيمة صفر في حالة التغير الموجب في إيرادات المبيعات، ويأخذ قيمة الواحد في غير ذلك. المعادلة الثانية، حيث المتغير التابع فيها المصروفات البيعية والعمومية والإدارية (SG&A) ، والمتغيرات المستقلة التغير في إيرادات المبيعات، ويأخذ قيمة صفر في حالة التغير الموجب في إيرادات المبيعات، ويأخذ قيمة الواحد في غير ذلك. المعادلة الثالثة، حيث المتغير التابع فيها المصروفات البيعية والعمومية والإدارية (SG&A) ، والمتغيرات المستقلة التغير في عدد العمال، ومتغير ثنائي يأخذ قيمة صفر في حالة التغير الموجب في عدد العمال، ويأخذ قيمة الواحد في غير ذلك.

نتائج التحليل الإحصائي لعينة الدراسة كشفت عن أن استخدام المتغيرات المادية (عدد العمال) والبعده عن المتغيرات المالية (إيرادات المبيعات أو تكلفة العمالة)، التي قد تتأثر بتغيرات الأسعار بدرجة كبيرة، قد أدى إلى اختفاء السلوك المتباين للمصروفات البيعية والعمومية والإدارية، على الرغم من أن استخدام المتغيرات المالية قد كشف عن السلوك المتباين لهذه التكلفة. نتائج التحليل الإحصائي لبيانات الدراسة كشفت أيضا إلى احتمالية أن تغيرات السعر كمؤثر جوهري في الإيرادات قد يمثل السبب الرئيسي للسلوك المتباين للتكلفة، وأن استبدال المتغيرات المادية بدلاً من المتغيرات المالية قد يُسفر عن نتائج مختلفة في كثير من الدراسات التي تناولت السلوك المتباين للتكلفة.

الكلمات الدالة: التكاليف المتباينة السلوك، سلوك التكاليف غير المتماثل، مبادئ محاسبة التكاليف، قرارات إدارة التكلفة.