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# The COVID-19 Pandemic, Cost Stickiness, and Profitability

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***Abstract.*** *Cost stickiness refers to an increase in costs when activities increase more than a decrease in costs in response to a decline in activities of the same magnitude. In this respect, managers play a crucial role in resource adjustment decisions, and various factors affect these decisions, including managerial optimism. In turn, managerial optimism is affected by economic conditions and economic crises, including the latest one affected by the Covid-19 pandemic. This will greatly reduce managerial optimism and motivate them to reduce greater resources when sales decline, even greater than the sales decline. Accordingly, this study tests the relationships between The Covid-19 pandemic, cost stickiness, and profitability of Indonesian listed firms in 2018-2020. We find that (1) firms reduce SG&A costs more to respond to sales decline during The Covid-19 pandemic, and (2) firms experiencing sales decline during The Covid-19 pandemic even exhibit better financial performance. Thus, this study indicates that higher profits are not always affected by increased income but also probably by cost decline that is greater than sales decline.*

***Keywords:*** *the Covid-19 pandemic, cost stickiness, profitability*

**Abstrak.** *Cost stickiness* mengacu pada peningkatan biaya sebagai respon atas kenaikan aktivitas yang lebih besar daripada penurunan biaya akibat penurunan aktivitas dengan besaran yang sama. Dalam hal ini, peran manajer dalam kebijakan penyesuaian sumber daya sangat mempengaruhi perilaku biaya

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tersebut dan berbagai faktor mempengaruhi kebijakan manajer tersebut, termasuk optimisme manajerial. Optimisime manajerial tersebut sangat dipengaruhi oleh kondisi perekonomian dan krisis ekonomi, termasuk krisis terkini akibat pandemi COVID-19, akan sangat mengurangi optimisme manajer yang membuat manajer bersedia mengurangi sumber daya saat aktivitas penjualan, bahkan pada tingkat lebih besar daripada penurunan aktivitas. Penelitian ini bertujuan untuk menguji hubungan antara pandemi COVID-19, *cost stickiness* dan profitabilitas pada perusahaan publik Indonesia tahun 2018-2020. Hasil dari penelitian ini menunjukkan bahwa, (1) saat pandemi COVID-19 perusahaan mengurangi biaya SG&A lebih banyak untuk merespon penurunan penjualan dibandingkan saat tidak terjadinya COVID-19 (2) perusahaan yang mengalami penurunan pendapatan selama periode COVID-19 justru mengalami peningkatan kinerja keuangan. Penelitian ini mengindikasikan bahwa kenaikan laba tidak selalu dipengaruhi oleh kenaikan pendapatan, tapi juga bisa oleh penurunan biaya yang lebih besar daripada penurunan pendapatan.

**Kata kunci:** pandemi COVID-19, *cost stickiness*, profitabilitas

## Introduction

Cost behavior refers to the relationship between cost changes and activity changes or costs' responses to their cost drivers. The traditional cost behavior concept assumes a linear and symmetric relationship between cost changes and changes (increase/decrease) in activity volumes, but in fact it is asymmetric. Such behavior is labeled as sticky costs. Costs are sticky when they increase at a greater magnitude when activity increases than their decline when activity decreases at a similar level (Anderson et al., 2003).

Prior studies have investigated factors affecting cost stickiness. Anderson et al. (2003) reveal that managerial resource adjustment decisions and adjustment costs affect sticky costs. Next, Banker et al. (2008); Sandra Cohen, Sotirios Karatzimas (2017); Zhong et al. (2020) observe that cost stickiness is affected by managerial optimism. Besides, Chen et al. (2012); Daryaei et al. (2021); Paik & Koo (2016); Roshan et al. (2023) utilize the agency perspective to interpret cost stickiness. Accordingly, this study uses managerial optimism to explain cost stickiness.

Managers behave differently depending on their problems. Banker et al. (2020) argue that economic conditions affect managers' operational decisions for several reasons. First, economic slowdowns greatly incentivize managers to keep more cash because firms cannot rely on external financing during economic crises. Second, economic crises increase managerial pessimism about future sales prospects. Third, economic crises enable firms to initiate operational changes and restructuration with lower internal resistance.

Macroeconomic conditions may motivate managers to respond. Anderson et al. (2003) imply that managers must ensure whether activity declines are more or less persistent because adding resources or costs is easier than reducing them. When sales decline but managers are optimistic that future sales will recover, they tend to preserve unutilized resources, leading to greater cost stickiness (Anderson et al., 2003; Salehi et al., 2017; Wahdan & Ahmed, 2021). However, pessimistic managers will reduce costs more aggressively when sales decline, leading to anti-sticky cost behavior (Banker et al., 2014). Managers must make decisions to respond to the sales decline. When sales decline during economic crises, managers tend to reduce operating costs more aggressively, such as laying off employees or reducing discretionary expenditures.

Banker et al. (2020) document that during the 2008 economic slowdown, sales-down firms even exhibit greater operating margins than those experiencing sales decline in "normal" periods. They attribute their findings to reductions in costs of goods sold and SG&A costs (other than R&D and advertising costs) greater than sales decline. Hence, firms exhibit profitability anomalies during economic slowdowns due to the interaction between macroeconomic slowdowns and sales decline (Banker et al., 2020).

Profitability anomalies are caused by the relationship between profitability, revenues, and costs (Binz, 2021). Firms experience sales decline both in crisis and non-crisis periods. However, they exhibit different cost behavior to respond to the declines. Sales-down firms tend to reduce lower costs when sales decline during non-crisis periods, leading to greater cost stickiness. However, during economic crises, sales-down firms tend to reduce greater costs, causing lower cost stickiness or even anti-sticky cost behavior. Economic crises incentivize managers to reduce sticky costs and restructure their firms to improve efficiency, leading to lower cost asymmetry or even anti-sticky costs. Hence, sales-down firms report higher operating profitability during economic crises than normal periods (Banker et al., 2020).

The Covid-19 pandemic greatly affects the global and Indonesian economies, as indicated by the fact that many Indonesian firms experience operational disruptions like credit default, employee layoffs, sharp revenue decline, and even legal cases due to business disruptions (Indonesian Stock Exchange, 2020). Such operational disruptions arguably affect their performance. For example, 82,45% of firms have experienced lower revenues, 8,76% have ceased their operations, and 24,31% of operating firms have reduced their capacity usage (like reduced machine or labor working hours) (Badan Pusat Statistik, 2020). Thus, Covid-19 potentially increases managerial pessimism about future sales because managers may expect the crisis to be lengthy.

This study refers to Banker et al. (2020) who associate sticky costs with economic growth and financial crisis. They operationalize economic slowdown with the 2008 financial crisis in the U.S. Meanwhile, our study differs from their study because we use the latest economic crisis due to Covid-19 as the independent variable. Such economic crises arguably have a direct effect on cost behavior (Hassanein & Younis,

2020; Nany et al., 2023; Wijayanti et al., 2022). Besides, the pandemic had massive impacts on the global economy that have not fully subsided. The cost stickiness issue during The Covid-19 pandemic remains arguably understudied, although costs behave differently during economic crises.

The Covid-19 pandemic affecting firms' operating activities likely affects managerial decisions to preserve sustainability. This fact motivates us to analyze the effect of the Covid-19 pandemic on the cost stickiness and profitability of Indonesian listed firms in 2018-2020. The Covid-19 phenomenon was discovered at the end of 2019 and the worst impact occurred in 2020, therefore the year that projects the impact of Covid-19 is 2020. Apart from that, this research was conducted in 2021 and completed in 2022, so the data that can be used is 2020 and previous years. This study seeks to test whether Indonesian firms exhibit sticky or anti-sticky cost behavior and profitability during The Covid-19 pandemic. We use the models developed by Anderson et al. (2003) and Banker et al. (2020) to test this issue.

This study focuses on managerial pessimism in Indonesian firms in facing the Covid-19 pandemic through anti-sticky cost behavior to maximize their profitability. Therefore, we seek to empirically confirm the influence of the Covid-19 pandemic on cost stickiness and profitability. This study contributes to the literature by empirically documenting the role of the Covid-19 pandemic in influencing managerial pessimism in explaining asymmetric cost behavior. Hence, this study informs academicians by highlighting cost behavior during the pandemic. Further, ours also advise managers in understanding cost behavior and making decisions accordingly.

## Literature Review and Hypothesis Development

### Literature Review

#### *Cost Stickiness*

The literature on cost behavior was widely discussed in the mid-1990s, which assumed that costs were divided into fixed costs and variable costs. Where variable costs will change proportionally along with changes in activity levels, while fixed costs do not change (Banker et al., 2014). In contrast to the traditional view that assumes linearity and proportionality of cost behavior, the evidence is that many researchers document the asymmetry of cost behavior. This research was proven by Anderson et al. (2003) who document an asymmetric cost behavior, especially in selling, general, and administrative (SG&A) costs. In contrast with the traditional cost behavior model, the magnitude of cost changes depends on the direction of activity changes. This asymmetric cost behavior is labeled as sticky cost behavior.

Cost stickiness exists when the magnitude of cost increases due to activity increases is greater than the amount of cost decreases when activity declines at a similar rate (Anderson et al., 2003). Sticky cost behavior is affected by three factors. First, managers make decisions based on their expectations of future costs, and greater

optimism (pessimism) motivates managers to reduce lower (higher) unutilized resources to anticipate future demands (Zhong et al., 2020; Ji et al., 2021) . Second, adjustment costs (such as firing, recruitment, and training) positively affect sticky costs (Anderson et al., 2003; Golden et al., 2020). Third, agency problems explain that managers have incentives to manipulate expenditures to affect their earnings (Kama & Weiss, 2013; Paik & Koo, 2016).

Several studies document the roles of these three factors in affecting cost stickiness. First, Anderson et al. (2003) argue that managers are more optimistic during better economic conditions or higher economic growth. Accordingly, they observe that higher economic growth periods make costs more sticky. Banker et al. (2014) argue that prior-period sales increases (decreases) lead managers to be more optimistic (pessimistic) about future demands, causing costs to be more sticky (anti-sticky).

Second, adjustment costs affect the levels of resources required to meet unpredictable future demands. For instance, finding, hiring, and firing employees are costly. Anderson et al. (2003) demonstrate that firms with higher adjustment costs (operationalized with higher employee and asset intensity) exhibit greater sticky cost behavior. Third, sticky costs may reflect managerial incentives. Chen et al. (2012) reveal a positive relationship between sticky costs and managerial incentives.

Several studies have also analyzed different costs' sticky behavior. For example, Anderson et al. (2003) and Paik & Koo (2016) use SG&A (selling, general and administrative) and document sticky cost behavior. Further, Kama & Weiss (2013) focus on total costs and find that SG&A and COGS (costs of goods sold) exhibit sticky cost behavior.

### *The COVID-19 Pandemic*

Economic crisis likely disrupts business continuity. Indonesia was subject to an economic crisis in 1998 and a global financial crisis in 2008. Indonesia again experienced an economic crisis in 2020-2021 due to the Covid-19 pandemic, which greatly affects global and national economies (Peterson, 2020). This economic crisis is arguably more complicated and unprecedented (Bank of Spain, 2020) because of its more significant and wider geographical coverage, implying a global problem (Irawan and Alamsyah, 2021).

Peterson (2020) argues that The Covid-19 pandemic has affected the global economy in two ways. First, virus expansion motivates social restriction that leads to activity closures, including business closure, furlough, disrupted trade and business due to restricted access to goods, and travel restrictions that disrupt aggregate supply (Abiad et al., 2020). Second, the spread of the virus and heightened uncertainty threaten security, consumption, and investments. Unfortunately, there is no agreement on when this restriction will be lifted, as it adds to the economic recession. More restrictive measures to save human lives lead to a more severe economic crisis (Eichenbaum et al., 2021).

Chen et al. (2019) argue that economic factors are crucial in explaining managerial expectations' effect on cost behavior. Banker et al. (2020) support this argument by

documenting that economic conditions significantly affect managers' operating decisions. Anderson et al. (2003) also reveal that prior-period macroeconomic growth affects the degree of cost stickiness. Thus, economic crises can affect managers' operational decisions, leading to different magnitudes of cost stickiness (Banker et al., 2013; Yang & Chen, 2023).

### *Profitability*

Profitability refers to firms' ability to generate profits (Said and Ali, 2016) that is affected by, at least partially, managers' and consumers' decisions. In turn, these decisions are affected by macroeconomic conditions and uncertainty that affect expectations of future macroeconomic conditions (Baker and Bloom, 2013). Uncertainty on future macroeconomic conditions also likely affects managers' and consumers' decisions, affecting firms' profitability.

Profits are generated by subtracting revenues from costs, implying that cost behavior affects profitability. Several studies find a relationship between current costs and future profits (Imani et al., 2023) and profitability (Abdullah, 2021). When sales decline, managers may retain their resources proportionally to boost sales or reduce unutilized resources (Argiles-Bosch, et al., 2017; Costa & Habib, 2023; Kwak et al., 2021) due to their different optimism levels. Optimistic (pessimistic) managers are likely to increase (reduce) costs. In other words, higher sales during higher macroeconomic growth cause managers to be more optimistic and increase resources to boost production, leading to lower profitability. Meanwhile, lower sales (especially during economic crises) lead managers to be more pessimistic and reduce more costs, implying higher profitability.

## Hypothesis Development

### *The COVID-19 Pandemic and Cost Stickiness*

The Covid-19 pandemic has caused one of the most severe global recessions. According to World Bank (2021), Covid-19 made about 1.8 million Indonesian to lose their jobs in February 2020 – February 2021. Besides, this pandemic-driven economic crisis is the only post-1998 economic crisis that caused the Indonesian economy to grow negatively (-2.2% in 2020). The economic crisis arguably affected various industries in Indonesia, like reduced revenues, lower capacity utilization (including shorter working labor and machine hours), and even discontinued operations (Badan Pusat Statistik, 2020).

Managers' resource adjustment decisions are affected by their optimism or pessimism due to future risks and uncertainty (Banker et al., 2008; Kwon, 2019). Anderson et al. (2003) posit that managers are optimistic about sales prospects during strong economic growth periods, even when experiencing sales decline. They will consider sales decline temporary and expect quick sales rebounds. This optimism will arguably lead to more sticky costs than during economic crises. During economic crises, managers are more pessimistic and thus reduce more unutilized resources when sales decline or do not add new resources (Stan, 2020; Zhong et al., 2020).

Further, firms need more cash during economic crises, so their managers are motivated to reduce resources. Ibrahim (2015); Nany et al. (2023) supports this argument by documenting that SG&A costs exhibit sticky costs during economic growth and anti-sticky behavior during an economic crisis.

As negative economic growth indicates, the Covid-19 pandemic that started in 2020 can increase managerial pessimism on future economic prospects. Pessimist managers tend to reduce more committed resources because they expect a lengthy crisis. As Banker et al. (2014) indicate, managerial pessimism reduces sticky costs and can even lead to anti-sticky cost behavior. Meanwhile, Indonesia experienced positive economic growth before 2020, motivating managers to be more optimistic about future prospects. Thus, costs arguably exhibit more sticky cost behavior because they add resources to meet future demands. Based on these arguments, the following is our first hypothesis:

$H_1$: Sales-down firms exhibit lower cost stickiness during the Covid-19 periods than in pre-Covid-19 periods.

*Cost Stickiness and Profitability*

Profitability refers to firms' ability to generate profits by utilizing their assets. Profit levels depend on managers' decisions in responding to fluctuating demands. Banker et al. (2014) suggest that asymmetric cost behavior may imply financial accounting. Cost behavior directly affects profitability, such as timeliness and predictability. The argument supports Anderson et al. (2003) who focus on how firm-specific information and condition affect managers' resource decisions. Banker et al. (2020) also demonstrate that an economic crisis greatly incentivizes managers to restructure their operating activities to improve their profitability through physical and labor asset adjustments.

Economic crisis drastically reduces sales, motivating managers to preserve their profitability through capacity adjustment. Lower profitability is closely associated with higher costs (Huang et al., 2014) because higher cost growth will reduce profitability. Prior studies, such as Warganegara & Tamara (2014), have confirmed the negative association between sticky cost and profitability. Kama & Weiss (2013); Soegiharto & Rachmawati (2022) also observe that managers will reduce sticky costs to achieve earnings targets. They are more willing to reduce unutilized resources when sales decline.

Reducing resources when sales decline increases profitability (Argiles-Bosch et al., (2017); Wijayanti et al., (2022)) and improves efficiency because lower productive capacity will boost efficiency. Faisal et al. (2021); Nikolaienko (2019) posit that firms with lower resources are more efficient. Hence, they focus more on increasing profitability by reducing unutilized resources when sales decline (Argiles-Bosch et al., 2017).

Sales-down firms reduce costs more in economic crises than normal periods (Banker et al., 2020). Consequently, these firms report higher profits during the crisis because the cost decline exceeds the revenue decline. Meanwhile, sales-down firms may

exhibit sticky cost behavior and report lower financial performance in normal periods because revenues exceed cost decline. The above arguments lead to the following second hypothesis:

$H_2$: Sales-down firms exhibit higher profitability in the Covid-19 pandemic era.

# Methods

## Research Design and Data Collection

We use an inferential research design with a quantitative approach. The inferential method not only describes cost stickiness phenomena or data but also analyzes and reveals the association between The Covid-19 pandemic, cost stickiness, and profitability among Indonesian listed firms in 2018-2020. Facts are not only described but also analyzed to test the hypotheses empirically. This study uses financial statements as the secondary data collected through the documentation technique. Data is generated from each firm's website or IDX' (Indonesian Stock Exchange) (https://idx.co.id/).

## Research Population and Sample

Our population is all firms listed at the IDX in 2018-2010. IDX classifies listed firms into nine sectors. This study excludes firms with incomplete data and firms from the financial, infrastructure, and property from the sample. These sectors have distinct business characteristics from other industries, arguably affecting their cost behavior. We use two pre-Covid 19 years (2018-2019) and one Covid-19 year (2020). The difference in sample number between these two periods will arguably not affect our results because the crisis periods are typically shorter than the non-crisis periods (Banker et al., 2020; Hassanein and Yunis, 2020). Our selection criteria generate 1,014 firm-year observations from 338 firms.

## Research Model

We use the commonly used sticky cost model to test the first hypothesis (Anderson et al., 2003; Jin & Wu, 2021) by using a dummy variable representing the effect of The Covid-19 pandemic with the following model:

*Model 1:*

$$\Delta\ln SG\&A_{i,t} = \beta_0 + \beta_1 \Delta\ln SALE_{i,t} + \beta_2 Dec_{i,t} * \Delta\ln SALE_{i,t} + \beta_3 Dec_{i,t} * \Delta\ln SALE_{i,t} * COVID + Control\ Variabel + \varepsilon_{i,t} \quad (1)$$

In this equation, $\Delta\ln SG\&A_{i,t}$ represents the log-change of SG&A costs (selling, general and administrative) for firm i in year t, and $\Delta\ln SALE_{i,t}$ is the log-change of firm i in year t. The $Dec_{i,t}$ variable is a dummy one that equals one if sales decrease in the current year and zero otherwise. Coefficient $\beta_1$ measures the percentage of SG&A cost change for each one percent of sales increase. Thus, coefficient $\beta_2$ on $Dec_{i,t}$ *$\Delta\ln SALE_{i,t}$ interaction represents cost stickiness (sticky if $\beta_2 < 0$, anti-sticky if $\beta_2 > 0$), and $\beta_1 + \beta_2$ represents the percentage of SG&A cost change for each one percent of sales decline. COVID is a dummy variable that equals one if the observation year is 2020 (The covid-

19 year) and zero otherwise. The $\beta_2 Dec_{i,t} * \Delta lnSALE_{i,t}$ interaction represents pre-Covid 19 cost stickiness, and the $\beta_3 Dec_{i,t} * \Delta lnSALE_{i,t} * COVID$ interaction refers to cost stickiness during The Covid-19 pandemic.

Our control variable for the first hypothesis is firm size and employee intensity (Anderson et al., 2003). We use total assets to operationalize firm size (Zulfiati et al., 2020) and the ratio between total employees with total sales as a proxy of employee intensity (Chen et al., 2012).

We use the prior model to test the second hypothesis (Banker et al., 2020) by analyzing the performance change during the Covid-19 pandemic with the following model 2:

*Model 2:*

$$PERF_{i,t} = \beta_0 + \beta_1 Dec_{i,t} + \beta_2 COVID_t + \beta_3 Dec_{i,t} * COVID_t + \beta_4 PERF_{i,t-1} + Control\ Variabels + \varepsilon_{i,t} \quad (2)$$

$PERF_{i,t}$ represents the net income of firm i in year t. $Dec_{i,t}$ (sales decrease) is a dummy variable that equals one if sales decrease for firm i in year t and zero otherwise. COVID is a dummy variable that equals one if the observation year is 2020 (The covid-19 year) and zero otherwise. $PERF_{i,t-1}$ is prior-year performance. Coefficient $\beta_1$ measures the effect of sales decrease on performance change. $\beta_2$ indicates the effect of the Covid-19 pandemic on firm performance, while $\beta_3$ represents the effect of sales decrease on performance change during the Covid-19 pandemic. Lastly, $\beta_4$ represents the effect of prior-year performance on current-year performance.

We scale $PERF_{i,t,}$ and $PERF_{i,t-1}$ with revenues. Next, the control variables for this second hypothesis are firm size (operationalized with total assets at the beginning of the period) and employee intensity. We use the beginning-of-year total asset value because current profitability affects the end-of-year figures. Employee intensity is commonly used in the cost stickiness literature to operationalize adjustment costs (Anderson et al., 2003; and Makni Fourati et al., 2020).

### Analysis Technique

We use multiple linear regression to test our hypotheses with the STATA application. Beforehand, this study runs the classical assumption test, such as multicollinearity and autocorrelation by analyzing the tolerance value and Variance Inflation Factors (VIF) Durbin-Watson (D.W.) values, respectively. We use robust-standard error regressions to ensure our specifications are robust to potential heteroskedasticity problems.

## Result and Analysis

## Descriptive Statistics

Table 1 presents the descriptive statistics of each research variable consisting of minimum and maximum, mean, and standard deviation values. We deflate the financial figures to facilitate comparison.

***Table 1. Descriptive Statistics***

| Variable | n: 1,014 | | | |
|---|---|---|---|---|
| | **Minimum** | **Maksimum** | **Mean** | **Standard Deviation** |
| $\Delta lnSG\&A_{i,t}$ | -4.750 | 3.925 | -0.072 | 0.483 |
| $\Delta lnSALE_{i,t}$ | -4.357 | 4.118 | 0.005 | 0.526 |
| SIZE | 9.399 | 14.533 | 12.181 | 0.757 |
| EMPLINT | 0.00 | 0.749 | 0.003 | 0.026 |
| $PERF_{i,t}$ | -87.513 | 6.321 | -0.155 | 3.214 |
| $PERF_{i,t-1}$ | -87.513 | 8.352 | -0.212 | 3.195 |
| Assets | 22.319 | 3.464 | 28.147 | 1.696 |

**Table 2. Descriptive Statistics (Dummy Variables) – Frequency Distribution**

| Dummy Variable | n: 1,014 | | | |
|---|---|---|---|---|
| | **Frequency** | | **Percentage** | |
| | **0** | **1** | **0** | **1** |
| Decrease Dummy | 414 | 600 | 0.408 | 0.592 |
| Dummy Covid-19 | 676 | 338 | 0.667 | 0.333 |

Table 1 displays the descriptive statistics of long-change SG&A, log-change of sales, firm size, employee intensity, prior and current performance, and beginning-of-period assets. If you look at several variables, many of the minimum values are minus, this indicates that there are losses or conditions that have occurred. However, when compared with the maximum value, the value is very far away, this proves that there is improvement or effort in achieving it.

Table 2 informs that most firms (about 60 percent), while observations from the Covid-19 periods only constitute a third of total observations. These figures suggest that many firms experience losses even before the economic crisis. Further, the classical assumption tests (untabulated) reveal that our data is not subject to multicollinearity and autocorrelation problems.

Our first hypothesis predicts that firms exhibit lower cost stickiness during the Covid-19 pandemic than before the pandemic. The following presents the test results of the first hypothesis:

**Table 3. The Results of Multiple Linear Regression Analysis: Hypothesis 1**

| Independent Variable | Dependent Variable $\Delta lnSG\&A_{i,t}$ | | | | | |
|---|---|---|---|---|---|---|
| | **(1)** | | **(2)** | | **(3)** | |
| | **Coeff.** | **Sig.** | **Coeff.** | **Sig.** | **Coeff.** | **Sig.** |
| $\Delta lnSALE_{i,t}$ ($\beta_1$) | 0.345 | 0.000*** | 0.359 | 0.000*** | 0.365 | 0.000*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| $Dec_{i,t}$ * $\Delta lnSALE_{i,t}$ ($\beta_2$) | 0.203 | 0.095* | -0.001 | 0.988 | 0.001 | 0.994 |
| $Dec_{i,t}$*$\Delta lnSALE_{i,t}$*$COVID_t$ ($\beta_3$) | | | 0.392 | 0.004*** | 0.403 | 0.005*** |
| $Dec_{i,t}$*$\Delta lnSALE_{i,t}$*Firm Size$_{,t}$ ($\beta_4$) | | | | | -0.058 | 0.486 |
| $Dec_{i,t}$*$\Delta lnSALE_{i,t}$*Employee Intensity$_{,t}$ ($\beta_5$) | | | | | -2.249 | 0.474 |
| $COVID_t$ ($\beta_6$) | | | 0.055 | 0.102* | 0.061 | 0.087* |
| Firm Size$_{,t}$ ($\beta_7$) | | | | | 0.023 | 0.201 |
| Employee Intensity$_{,t}$ ($\beta_8$) | | | | | 1.773 | 0.818 |
| $R^2$ | 0.229 | | 0.244 | | 0.249 | |
| N | 1,014 | | 1,014 | | 1,014 | |

Note: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively

Table 3 presents the results of linear regression analyses to investigate cost behavior (sticky vs. anti-sticky cost) during the Covid-19 pandemic. Column 1 displays the basic analysis of cost stickiness following Anderson et al. (2003) without the Covid-19 and control variables. The results indicate that our sample firms exhibit an anti-sticky cost behavior, as indicated by positive coefficient values of $\Delta lnSALE_{i,t}$ and $Dec_{i,t}$*$\Delta lnSALE_{i,t}$ (p-values = 0.000 and 0.095, respectively). Thus, SG&A costs increase by 0.345% for each 1% sales increase but decrease by 0.548% (0.345% + 0.203%) for each 1% sales decrease.

Column 2 includes the Covid-19 variable and its interaction with $Dec_{i,t}$*$\Delta lnSALE_{i,t}$. The findings suggest that during the Covid-19 pandemic, sales-down firms reduce their costs 0.392% greater than before the pandemic when sales decline by 1% (p-value = 0.01). In column 3, we include the control variables and generate qualitatively similar results. In particular, the $Dec_{i,t}$*$\Delta lnSALE_{i,t}$*$COVID_t$ coefficient remains positive (0.403) with a p-value=0.005. The results confirm the findings in column 2, i.e., sales-down firms reduce more SG&A costs during the pandemic than before the pandemic.

In sum, the tests for hypothesis 1 demonstrate that firms exhibit anti-sticky cost behavior before the pandemic, as indicated by a positive value of the $Dec_{i,t}$*$\Delta lnSALE_{i,t}$ coefficient. The anti-sticky cost behavior is greater during the pandemic ( the $Dec_{i,t}$*$\Delta lnSALE_{i,t}$*$COVID_t$ coefficient is positive). Thus, our findings empirically support the first hypothesis predicting that sales-down firms exhibit lower cost stickiness during the Covid-19 pandemic than before the pandemic.

Our second hypothesis predicts that sales-down firms exhibit higher profitability during the Covid-19 pandemic. We also test the second hypothesis with multiple linear regression. The following table presents the results of the hypothesis testing

**Table 4. The Results of Multiple Linear Regression Analysis: Hypothesis 2**

| **Independent Variable** | **Dependent Variable: $PERF_{i,t}$** | |
|---|---|---|
| | **Coeff.** | **Sig.** |
| $Dec_{i,t}$ ($\beta_1$) | -0.335 | 0.206 |
| $COVID_t$ ($\beta_2$) | -0.989 | 0.065* |
| $Dec_{i,t}$*$COVID_t$ ($\beta_3$) | 1.258 | 0.034** |
| $PERF_{i,t-1}$ ($\beta_4$) | 0.832 | 0.071 |

| | | |
|---|---|---|
| Firm Size $_{,t}$ ($\beta_5$) | -0.112 | 0.141 |
| Employee Intensity$_{,t}$ ($\beta_6$) | -25.745 | 0.176 |
| $R^2$ | 0.115 | |
| N | 1.014 | |

Note: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively

Table 4 indicates that firms experience lower operating performance during the Covid-19 pandemic, as indicated by a negative COVID-19 coefficient (-0.989, p=0.065). However, sales-down firms experience higher operating performance during the pandemic, as indicated by a positive coefficient of $Dec_{i,t}$*$COVID_t$ (1.258, p=0.034). Thus, our results empirically support the second hypothesis predicting that sales-down firms exhibit higher profitability during the Covid-19 pandemic.

### Result Discussions

A likely cause of cost stickiness is managerial optimism/ pessimism. Optimistic (pessimistic) managers about future activity prospects will likely reduce lower (more) unutilized resources when activities decline. The Covid-19 pandemic significantly worsens the economy and reduce sales. This study documents that first, firms exhibit the Covid-19 pandemic and lower cost stickiness or even anti-sticky cost, and second, sales-down firms experience higher performance during the Covid-19 pandemic. Thus, both hypotheses are empirically supported.

The first findings indicate that during the Covid-19 pandemic, firms reduce more SG&A costs to respond to sales decline than before Covid-19. The results are consistent with Anderson et al. (2003) who argue that managers are crucial in committed resource adjustment in responding to sales changes. When managers are very pessimistic about future sales prospects (like during the Covid-19 pandemic), they are willing to reduce more resources when sales decline than during normal conditions. Such as Kwak et al. (2021) who proves that during Covid-19 firms will reduce R&D investment costs. Consequently, firms tend to exhibit anti-sticky cost behavior during the pandemic. This is in accordance with research by Banker et al. (2020) and supported by Yang & Chen (2023) who found that the Covid-19 crisis had a greater impact on the level of cost stickiness in China compared to Australia.

Second, sales-down firms during the Covid-19 pandemic exhibit better financial performance. The findings are consistent with Banker et al. (2020) who document that economic conditions affect managerial decisions. The pandemic causes a massive and severe global economic crisis that reduces (increases) managerial optimism (pessimism). Thus, firms experiencing sales decline during the pandemic are more willing to reduce more costs, even at more than the sales decline. Consequently, these firms even exhibit better financial performance when sales decline. In other words, economic crises affect managerial decisions on reducing unutilized resources because managers are more willing to respond to economic slowdowns more effectively or uncertain demands than during normal periods (Hassanein and Younis, 2020).

## Conclusions

This study empirically demonstrates the effect of the Covid-19 pandemic on cost stickiness and the effect of the pandemic on sales-down firms' performance. The pandemic causes a severe economic slowdown that increases managerial pessimism. We document that firms exhibit anti-sticky cost behavior (lower cost stickiness), increasing their profits during the pandemic. Changes in firm performance are not only affected by sales changes but also by how costs change to respond to sales changes.

Our findings offer theoretical and practical implications. First, this study confirms that managerial pessimism influences asymmetric cost behaviour. In addition, we empirically show the effect of the Covid-19 pandemic on lower cost stickiness or anti-sticky cost behavior and its effect on profitability in the Indonesian setting. Sales-down firms may improve their performance because they reduce costs more than sales decrease, especially during the Covid-19 pandemic. Second, financial statement users must analyze the causes of performance changes more comprehensively and cautiously. Hence, our findings are expected to contribute to the cost stickiness literature.

This study analyzes SG&A cost behavior because not all firms have other cost categories (like costs of goods sold). Besides, we start data collection at the end of 2021 and do not include 2021 as the observation year. Thus, we only have a year belonging to the crisis period. Future studies can use other cost categories and expand the observation periods to generate a more comprehensive description of the effect of Covid-19 on cost behavior.

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