

The Effects of Managerial Attributes on Cost Stickiness: An Empirical Analysis of Korean Exporters and Implications for Start-ups

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Abstract

Purpose – We attempted to empirically verify the effects of managerial attributes on cost stickiness in exporters. Exporters are often affected not only by external factors such as exchange rate but also by internal factors such as managerial attributes regarding their business activities. Because cost stickiness is the product of a manager's decision-making, it has been considered that managerial attributes have a great influence on the behavior. Therefore, our study was intended to find out whether cost stickiness shows differentiated aspects depending on managerial attributes in exporters.

Design/methodology – We considered two managerial attributes: CEO power and managerial overconfidence. First, CEO power was measured as CEO pay slice. In addition, managerial overconfidence was measured based on three methodologies presented by previous studies. To measure cost stickiness, we used multiple methodologies presented by prior research.

Findings – The results of our empirical analysis are as follows. First, in export firms, the greater CEO power is, the greater cost stickiness is. This result suggested that export managers with great influence little respond to temporary sales decrease promptly, little reduce related production costs flexibly in preparation for future sales recovery, but leave room to endure costs for idle resources. Second, the greater managerial overconfidence is, the greater cost stickiness is. This result indicated that export managers with great overconfidence on their decision-making often view the prospect for sales recovery positively; therefore, they little respond to temporary sales decrease immediately, little reduce related production costs flexibly for future sales recovery, but leave room to endure costs for idle resources. Third, export managers with great influence in their businesses and great overconfidence in their decision-making tend to show relatively great cost stickiness. The results proposed that the combination of the two factors functions to make cost stickiness greater.

Originality/value – Our study is differentiated from extant studies in that we provided empirical evidence of the effects of managerial attributes on their business activities in exporters. Specifically, we verified the effects of managerial attributes on cost stickiness in Korean exporters. The results of our study are expected to contribute to providing useful information for exporters and start-ups.

Keywords: Cost Stickiness, Exporter, International Accounting, International Finance Management, Start-ups

JEL Classifications: F30, M13, M41

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1. Introduction

As the Comprehensive Economic Partnership (hereinafter referred to as RCEP), a free trade agreement (hereinafter referred to as FTA), was launched on November 15, 2020, the export expansion of Korean companies is expected. The RCEP accounts for about 30% of the world from the aspects of trade volume and gross domestic product (hereinafter referred to as GDP), and the establishment of the RCEP has established a free trading zone with a population of 3.4 billion, \$10 billion and \$131 billion of trade volume (about one billion and 1,043 trillion won) and 19 trillion and \$764 billion of GDP valued at current prices. This is the launch of the biggest world economic bloc that exceeds the North America Free Trade Agreement (hereinafter referred to as NAFTA, \$18 trillion) and European Union (EU, \$17 trillion and \$600 billion) based on GDP at current prices. The launch of the RCEP is expected not only to diversify Korea's export market and trade structure but also to lower the tariff threshold greatly in the ASEAN market, mainly on automobiles and steel industries, expanding export routes.

As shown above, the launch of ESRP will be a turning point for Korean export companies struggling from deteriorated profitability caused by the fall in the exchange rates and the increase of raw material prices accordingly in addition to negative business sentiment due to the spread of COVID-19 in 2020. Actually, in the Business Survey Index (hereinafter referred to as BSI) conducted by the Korea Economic Research Institute on the 600 biggest companies based on sales on November 25, 2020, the observation value of December was 98.9, which was 0.6% lower from November (99.5).

Specifically, the negative business sentiment is expected to continue in 2021 as the uncertainty increases due to COVID-19, so the response of export companies is more important. While companies engage in decision making toward enhancing investment by increasing facilities in economic prosperity and employing additional manpower in order to prepare for sales increases, during a recession, they tend to reduce facilities and manpower, or lower maintenance costs through liquidation of idle resources to cope with sales decreases.

Decision making appears differently according to managerial attributes, the highest decision makers in companies. First, managers with high influence in companies possibly maintain available assets and investment levels in preparation for economic prosperity after a recession instead of retrenchment for a temporary recession from the long-term management prospect. On the other hand, those with less influence respond to each year's business performance sensitively, and greatly lower the current available assets and investment levels during a recession. Therefore, production cost behaviors can be different depending on the influence of managers. In addition, if managers have high overconfidence in their decision making, they tend to consider the current recession a temporary transition period, or a chance for aggressive management, despite the negative prospect, and maintain the current available assets and investment levels in preparation for a future economic boom instead of retrenchment for the recession.

Thus, our study intends to investigate whether the influence of managers in export companies have a differentiated effect on production cost behaviors, whether the overconfidence of managers has a differentiated effect on production cost behaviors, and whether the interactions of the above factors have a differentiated effect on production cost behaviors. The results are expected to contribute to the development of a sound capital market by providing useful information about business activities of export companies to participants of capital markets. Our study is also expected to be differentiated from precedent studies in that it comprehensively verifies effects of managerial attributes on the business activities of export companies.

Our study consists of the following chapters. In Chapter 1, the introduction presents the backgrounds and objectives of this study. In Chapter 2, related precedent studies are presented based on which hypotheses are established. In Chapter 3, the research model is presented, along with research model's variable definition and the process of selecting research sample. In Chapter 4, the empirical analysis results of descriptive statistics, correlation analysis, and hypothesis verification multivariate regression analysis are presented. In Chapter 5, we summarize the results and present managerial implications for start-ups, and note the limitations of our study.

2. Literature Review and Hypothesis Development

2.1. Literature Review

2.1.1. Managerial Attributes

This study focuses on the influence and overconfidence tendency of managers as managerial attributes. Therefore, prior studies are classified into influence and overconfidence tendencies of managers.

CEO Power. As the importance of managers is emphasized, there have been various analyses and studies on their influence and ability (Lee Kang-Young and Yun Sung-Man, 2011; Kim Seong-Gap et al., 2017; Kim Hyung-kook, 2018; Bukangkang and Lee Chan-Ho, 2018). However, it is not easy to measure the influence of managers involved with many factors objectively. Meanwhile, as Bebchuk et al. (2011) presented the measured value "CEO Pay Slice" (hereinafter referred to as CPS) that simply digitizes management concentration levels with the ratio of CEO's salary among total wages of the top five wage ranks, there are multiple studies that utilize this as a vicarious variable of a CEO's influence. In Korea, as the wage information of registered individual executives was noted in accordance with the revision of the Capital Market Act in 2013, many studies using the methodology of Bebchuk et al. (2011) have been made. A representative study in Korea that uses the methodology of Bebchuk et al. (2011) was by Kwak Young-Min and Kim Hyun-Jin (2017). They verified the influence of CPS on company value and excessive investment, and found that when the CPS level was higher, the company value deteriorated, and inefficient decision-making levels, like excessive investment, became higher. Mun Bo-Young and Chun Hong-Min (2018) reported that as CPS increased, the cost of equity capital increased. Kim Ji-Young and Ji Sang-Hyun (2018) verified the correlation between CPS and Book-Tax Difference (BTD), and reported that companies with high CPS were high in BTD, and managerial transparency was lower. Kim Young-Sik (2018) suggested that companies with higher agency costs, like family-run companies, have a high possibility to allocate internal resources, but as the quality of corporate governance is higher, management concentration can be effectively controlled. Kim Yu-Jin (2018) reported that as CPS increased, the credit rating was lower, and CPS was recognized differently in owner manager companies and professional management companies. An Jung-In and Kim Yu-Jin (2018) reported that companies with higher CPS tended to evade information disclosure obligations related to executive wages. Yun Woo-Young et al. (2019) verified the correlation between CPS and earnings management from the aspects of the accounting earnings management and the real earnings management, and reported that companies with higher CPS have higher earnings management levels. An Sang-Bong et al. (2019) reported that an increase in CEO influence in the service industry can have a negative effect on the reliability of accounting information. The results of the above

precedent studies using CPS information show that in companies with great CPS, a strong influence of managers had a negative effect on overall company management.

Managerial Overconfidence. Prior studies on managerial overconfidence tendency are broadly divided into four subjects.

The first subject is the relevance between managerial overconfidence and investments. Hayward and Hambrick (1997) suggested that when managers were overconfident about decisions in mergers and acquisitions, there was a higher possibility that they would overestimate the synergy effects of M&A, and that the cost of business rights would be excessively great. Heaton (2002) mentioned that companies with managers with high overconfidence tendencies were underestimated, and internal capital was used to compensate investment related cost. Malmendier and Tate (2005) argued that managers with high overconfidence in future profits tended to overestimate investment profit rate. Malmendier and Tate (2008) claimed that managers with high overconfidence did not try M&As very often, but they possibly paid excessive amounts to incorporated firms and participated in M&As that reduced company values. Ben David et al. (2012) said that managers with overconfidence create more debts. Kim Hui-Jung and Park Won (2019) said managerial overconfidence and excessive investment activities had a positive (+) effect on company values.

The second subject is the relevance between managerial overconfidence and dividend policy. Deschmukh et al. (2013) said that as executives had higher overconfidence, the dividend ratio was lower. Hwang Gyu-Young and Kim Eung-Gil (2018) claimed that managers with high overconfidence decided dividends passively for aggressive investments, and tried to secure surplus funds. On the other hand, Choi Hae-Rin et al. (2020) claimed that dividend ratio, dividend yield ratio, and manager overconfidence (optimism) had positive (+) relevance, so managers with higher overconfidence paid more.

The third subject is the relevance between managerial overconfidence and accounting information. Schrand and Zechman (2012) claimed that overconfident managers brought about more accounting errors. Hirschleifer et al. (2012) claimed that when managers were more overconfident, they spent more on research and development costs, tried to acquire more patents, and had higher possibilities to enjoy innovative success. On the other hand, Kang Shin-Hee (2019) claimed that when managerial overconfidence was greater, the accounting ratio of research and development costs was higher. Ahmed and Duelman (2013) and Ryu Hae-Young and Kim Sae-Ro-Na (2015) said when managerial overconfidence was higher, accounting was less conservative. Hribar and Yang (2013) claimed that managers with higher overconfidence tended to open business forecasting information, and enhance company profits. Bouwman (2014) said managers with higher overconfidence were optimistic about future performance, so they executed earnings smoothing in order to increase profits during poor performance periods. Schrand and Zechman (2011) and Gau and Han Kil-Seok (2018) claimed that managerial overconfidence and earnings management had a positive (+) relevance, so when managerial overconfidence was higher, the level of earnings management was higher. Lee Jin-Su and Oh Sang-Hee (2020) claimed that when managerial overconfidence was higher, cost asymmetry was higher, but this tendency could be partially controlled through a control system. Kim Na-Youn and Hwang Kook-Jae (2020) claimed that the level of competition in an industry functions as a controller on the tendency of upgrading profits through discretionary accruals of managers with high overconfidence.

The fourth is the relevance between managerial overconfidence and tax information. Cha Myun-Ki, Kim Su-Sung, and Hwang Kook-Jae (2016) and Jang et al. (2017) claimed that managers with higher overconfidence had lower tax avoidance, which led to a higher quality

of profits. Jang et al. (2017) claimed that managers with higher overconfidence were more active in tax avoidance, and this tendency was lower when governance was good. Kim Sang-Myeong, Park Sung-Ook, and Chung Hee-Sun (2019) said that managers with high overconfidence gave more weight to the reduction effect of non-tax costs expected as book reporting earnings were upgraded than to the increased effect of tax costs by the increase of taxable income, so they were passive in tax avoidance. Nam Hye-jeong (2019) claimed that when managers were more overconfident, they had higher tax risks, and when manager ownership percentages were higher, the positive (+) relation between overconfidence and tax risk was reinforced. Ji Sang-Hyun (2020) claimed that when managerial overconfidence was greater, Book-Tax Difference (BTD) was greater, so managers with higher confidence tended to be involved with accounting. Park Jong-Il and Kim Su-In (2020) claimed that both financial constraint and managerial overconfidence had a positive (+) relation with tax avoidance, and the interaction of these also had a positive (+) relation with tax avoidance.

Other studies are on the relevance between managerial overconfidence and audit quality (Kim Sang-Mi, Shin Hee-Jung and Kim Su-In, 2019; Shin Bo-Sun and Woo Yong-Sang), the relevance between managerial overconfidence and profit forecasting (Kim Sung-Hwan, 2018; Lee Da-Hye and Byun Sang-Hyuk, 2020), and the relevance between managerial overconfidence and market response (Kim Byung-Mo, 2016; Lee Hye-Mi and Hong Chang-Mok, 2018; Kim Sung-Hwan, 2019).

2.1.2. Cost Stickiness

Anderson et al. (2003) discovered that Selling, General, and Administrative Costs (SG&A costs) decrease less when sales decrease than the increase of Selling, General, and Administrative Costs when sales increase, and defined this phenomenon as cost stickiness. Since they presented the concept of cost stickiness, it has gathered the most attention in management accounts in Korea. Domestic studies on cost stickiness can be divided into three groups.

First are studies that measure domestic company cost stickiness. An Tae-Sik et al. (2004) analyzed domestic cost stickiness using the methodology of Anderson et al. (2003), and claimed that manufacturing costs and SG&A costs showed cost stickiness. Baek Won-seon (2017) claimed that sales elements that are correlated with costs when sales decrease compared to those when sales increase show downward elasticity, but sales elements that were not correlated with costs showed cost stickiness.

Second are studies on factors that affect cost stickiness. Jang Seung-Hyun and Baek Tae-Young (2009) claimed that the various management conditions (e.g., cash flow, financial condition, business growth, R&D investment, equipment investment) of a company affect a manager's decision-making, so there can be different cost behaviors in SG&A costs. Chi Sung-Kwon, Shin Sung-Wook, and Choi Won-Ju (2009) claimed that the cost stickiness of SG&A costs was greater when the ratio of tangible assets was higher, surplus cash flow was greater, and investment opportunities were greater, but the cost stickiness of SG&A costs was less when inventories assets turnover periods were longer. Park Ae-Young (2014) claimed that KOSDAQ companies with CEO embezzlement had greater cost stickiness in the year when the embezzlement occurs than those with no embezzlement, and when the amount of embezzlement was greater, and when the embezzlement was through collusion, and when the time gap until the embezzlement disclosure was greater, cost stickiness became greater. Yim Sang-Giun, Park Jin-Ha, and Hwang In-Y (2014) claimed that there was a positive correlation between cost stickiness and the change of internal cash reserves, so companies that dispose of resources tended to reserve cash assets for future investments. Park Ae-Young and Kwak Ji-Young (2014) claimed that when the level of overall governance structure was fair, cost

stickiness was relieved, and when governance structure improved, cost stickiness was relieved. Yang Dae-Cheon (2015) claimed that optimistic forecasting during growth periods could affect decision making on expansive resources and production costs. Lee Sang-Cheol and Kim Suk-Yeon (2015) claimed that companies with higher levels of social responsibility activities showed greater cost stickiness, but the continuity of performance on social responsibility activities was not related to cost behavior. Son Jae-Seong, Lee Yong-Kyu, and Park Jin-Ha (2019) claimed that cost stickiness at the company level appeared in bank branches, and branches valued less in the current year than in the previous year showed lower cost stickiness in response to the current year's sales decrease. Noh Gil-Kwan (2019) claimed that differentiated relations existed in earnings management types and cost behaviors, and this tendency was different between Korean and Japanese companies. Moon Hye-Won, Goh Chang-Youl, and Jung Hoon (2020) claimed that digital companies with important R&D tended to less reduce R&D costs than other companies when sales decreased.

Third, extant studies verified whether cost stickiness affected business activities. Park Yeon-Hee, Koo Jung-Ho, and Pae Su-Il (2012) claimed that cost stickiness indirectly provided intentional decision making that future profits would increase, and this had an information effect in the market. Lee Mi-Yeong, Hong Young-Eun, and Park Jong-Kook (2015) claimed that cost stickiness was when managers maintained production costs to cope with future demand increases, the market judges this as rational decision making, and this information effect was not relieved by a labor union. Kim Tae-Seong et al. (2015) claimed that credit rating institutions judge the quality of accounting incomes differently according to the degree of cost stickiness, and this was reflected in credit ratings. Jeong Sung-Hwan (2015) claimed that when cost stickiness was based on agency matter in the decrease of current year's sales from the previous year increases, the ratio of costs rises, and discretionary accruals increase. Hong Yeung-Eun, Kim Soo-Jin, and Park Jong-Kook (2020) claimed that when the level of cost stickiness was high, a risk of a sharp drop in stock price was low.

2.2. Hypothesis Development

Exporters are more likely to perform business activities under complicated external environments of business fluctuations, exchange rates, language barriers, cultural differences, and regional risks compared to domestic companies. Therefore, the roles and importance of managers are more highly regarded in these companies than domestic companies. Managers, the highest decision, play very important roles not only in business activities but also in business forecasting and responses. In other words, the greater CEO power, the greater their influence is reflected in business forecasting and responses, and managers with higher confidence in their decision making more likely to put importance on their own judgment in business forecasting and responses.

Exporters are very sensitive to external business fluctuations, and the differentiation of decision making can be very critical in economic prosperity and recessions. In economic prosperity, production equipment should be expanded for future sales increases, and various countermeasures, such as personnel development, should be prepared. In recession, the reduction of idle resources should be considered for sales decreases. These resilient business behaviors are very helpful for management, and ultimately, they have a direct effect on the survival of companies. Meanwhile, resilient business behaviors do not always have a positive effect on future business performances. A high level of time use and costs could be required to replenish idle resources that have been reduced due to sales decreases during recession. In addition, business behaviors sensitive to business fluctuations can be a negative factor that lower the stability of a company. These management strategies are the products of company

decision-making, and they become concrete as opinions of various interest parties are reflected, but the judgment of a manager accounts for the highest portion. In other words, company management strategies are established according to manager decision-making, and therefore, in comprehending a management behaviors, it is helpful to focus on managerial attributes. Thus, this study intends to find whether cost behavior can be differentiated depending on manager characteristics.

Under the traditional cost system, costs were assumed to show symmetrical behavior regardless of the increase/decrease in activity level, but decreasing costs when activity level low is more difficult than increasing costs when activity level is high, which leads to cost stickiness (Cooper and Kaplan 1998). Anderson et al. (2003) focused on the response of a manager to increases and decreases in product demand as the major cause of cost stickiness. They explained that when increased product demand exceeded supply, the manager promptly expanded definite resources, but when product demand does not reach supply due to a decrease in product demand, the manager decides to reduce surplus resources, and the CEO responds to the reduction of surplus resources passively in consideration with opportunity cost and others in case of an increase in product demand, so there is cost stickiness.

This study focuses on the following two matters as important considerations when companies handle adjustment costs by reducing surplus resources as sales decrease, or endure maintenance costs by holding surplus resources. First is the influence of the CEO in the decision-making process of a company. If the CEO has enough influence to handle a short-term loss, the CEO does not react to short-term maintenance costs sensitively, but can manage the company from a long-term perspective. In this case, there will be cost stickiness. In other words, the higher a CEO's influence, the greater cost stickiness. Thus, a research hypotheses can be established as follows.

H1. When CEO power in export companies is higher, the tendency of cost stickiness is higher.

Second is the level of managerial overconfidence in future sales trends. If a manager is firmly confident that the current sales decrease is temporary, and a future sales increase is expected, the manager is willing to endure the maintenance costs for the surplus resources incurred due to the current sales decrease (Park Yeon-Hee, Koo Jung-Ho, and Pae Su-Il, 2012). In this case, there will be cost stickiness. That is, when managerial overconfidence is greater, cost stickiness is higher. Therefore, the following research hypothesis can be established.

H2. When export company managers have greater overconfidence, the tendency for cost stickiness is higher.

If the tendency of cost stickiness is higher when CEO power is greater and managerial overconfidence is higher, cost stickiness can be even greater with managers with greater influence and overconfidence. Managers with greater influence and overconfidence in their decision-making have a stronger intention to endure maintenance costs of surplus resources caused by an immediate sales decrease under a positive prospective for future sales. In other words, when CEO power influence and overconfidence are greater, cost stickiness is higher. Thus, the following hypothesis can be established.

H3. When CEO power and managerial overconfidence in export companies are higher, cost stickiness is higher.

3. Research Design

3.1. Sample and Data

The samples used in this study are companies that satisfy all following conditions among securities market listed companies from 2013 to 2017.

- (1) Non-financial company in the settlement of accounts in December
- (2) Not designated with impaired capital or issues for administration
- (3) Company with current year exports
- (4) Financial information can be gathered at FnGuide

First, regarding resources, financial materials were gathered from FnGuide, and companies with current year exports only were selected. Among 3,353 companies that satisfied sections (1) and (2), 1,311 companies with no current year exports, and 75 companies whose financial information could not be gathered, were excluded, so a total of 1,967 companies were selected.

Meanwhile, manager influence was measured with the methodology of Bebchuk et al. (2011), overconfidence was measured with the methodology of Ahmed & Dullman (2013) and Schrand and Zechman (2012), and cost stickiness was measured with the methodology of Homburg and Nasev (2008) and Weiss (2010). However, in measuring the influence of managers with the methodology of Bebchuk et al. (2011), the missing value was very large due to an omission of disclosure data, and in measuring cost stickiness by the methodology of Weiss (2010), the missing value was very large as well. Therefore, when all the missing values are removed at the same time in the calculation process of measured values, there is a possibility that convenience from missing values of research samples can appear. Thus, in this study, based on the first research samples, research samples were selected differently according to research methodologies, and the second research samples were selected as follows.

First, to verify Hypothesis 1, Research Samples 1-1 and 1-2 were organized in Table 1. In Research Sample 1-1, the influence of managers was calculated with CPS according to the methodology of Bebchuk et al. (2011), 845 samples that were excluded when cost stickiness was calculated according to the methodology of Homburg and Nasev (2008), and 102 samples that had outliers in each variable were removed (average ± 3 ×standard deviation exceeding samples), so a total of 1,110 companies are final samples.

In Research Sample 1-2, the influence of managers was calculated with CPS according to the methodology of Bebchuk et al. (2011), 671 samples were excluded when cost stickiness was calculated according to the methodology of Weiss (2010) along with 68 samples with outliers in each variable (average ± 3 ×standard deviation exceeding samples), so a total of 671 companies are final samples. Table 1 presents the result of final selection of research samples.

Next, Table 2 shows the organization for Research Sample 2-1 and 2-2 for verification of H2. In Research Sample 2-1, 11 samples were excluded when cost stickiness was calculated according to the methodology of Homburg and Nasev (2008), and 235 samples with outliers for each variable (average ± 3 ×standard deviation exceeding samples) were excluded, so a total of 1,721 companies comprise the final sample. In Research Sample 2-2, 1,296 samples were excluded when cost stickiness was calculated according to the methodology of Weiss (2010), and 68 companies with outliers for each

variable (average $\pm 3 \times$ standard deviation exceeding samples) were excluded, so a total of 603 companies comprise the final sample. Table 2 presents the final selection of research samples.

Table 1. Sample for the H1 Test

Research Sample 1-1	
Non-financial enterprises listed on Korea Exchange as of December, 2013~2017	3,353
Companies whose financial information could not be gathered from FnGuide	(75)
Non-exporters with no current year exports	(1,311)
Companies whose CPS could not be calculated with the methodology of Bebchuk et al. (2011)	(845)
Company samples that are outliers [average ± 3 (standard deviation)]	(102)
<u>Final Samples</u>	<u>1,110</u>
Research Sample 1-2	
Non-financial enterprises listed on Korea Exchange as of December, 2013~2017	3,353
Companies whose financial information could not be gathered from FnGuide	(75)
Non-export companies with no current year exports	(1,311)
Companies whose CPS could not be calculated with the methodology of Bebchuk et al. (2011), and whose cost stickiness could not be calculated with the methodology of Weiss (2010)	(1,296)
Company samples that are outliers [average ± 3 (standard deviation)]	(68)
<u>Final Samples</u>	<u>603</u>

Table 2. Sample for H2 Test

Research Sample 2-1	
Non-financial enterprises listed on Korea Exchange as of December, 2013~2017	3,353
Companies whose financial information could not be gathered from FnGuide	(75)
Non-export companies with no current year exports	(1,311)
Companies whose cost stickiness could not be calculated with the methodology of Homburg and Nasev (2008)	(11)
Company samples that are outliers [average ± 3 (standard deviation)]	(235)
<u>Final Samples</u>	<u>1,721</u>
Research Sample 2-2	
Non-financial enterprises listed on Korea Exchange as of December, 2013~2017	3,353
Companies whose financial information could not be gathered from FnGuide	(75)
Non-export companies with no current year exports	(1,311)
Companies whose cost stickiness could not be calculated with the methodology of Weiss (2010)	(1,296)
Company samples that are outliers [average ± 3 (standard deviation)]	(68)
<u>Final Samples</u>	<u>603</u>

On the other hand, H3 is relevant to CEO power and managerial overconfidence. In this respect, we attempted to test the hypothesis with Research Samples 1-1 and 1-2, respectively.

3.2. Research Model

The objective of this study is to verify the effects of manager characteristics in export companies on cost stickiness. Managerial attributes, which are independent variables, are CEO power and managerial overconfidence, and the dependent variable is cost stickiness that shows cost behavior. For verification of interaction effects among managerial attributes, the interaction variables of CEO power and managerial overconfidence were added. The research model is as follows.

First, the following equation (1) is the verification model of H1.

$$\begin{aligned} \text{Sticky_}(1),(2)_{i,t} &= a_0 + \beta_1 \text{CPS}_{i,t} + \beta_2 \text{SIZE}_{i,t} + \beta_3 \text{LEV}_{i,t} + \beta_4 \text{ROA}_{i,t} + \beta_5 \text{R\&D}_{i,t} + \beta_6 \text{GRW}_{i,t} \\ &+ \beta_7 \text{FirmAge}_{i,t} + \beta_8 \text{BIG4}_{i,t} + \sum \text{IND} + \sum \text{YEAR} + \varepsilon_{i,t,t} \end{aligned} \quad (1)$$

Stick_{(1),(2)}_{it} : Two measurements of cost stickiness.

Stick₍₁₎_{it} : A measurement of cost stickiness measured via the method of Homburg and Nasev (2008)

Stick₍₂₎_{it} : A measurement of cost stickiness measured by the method of Weiss (2010)

CPS_{it} : A measurement of CEO power measured by the method of Bebchuk et al. (2011)

SIZE_{it} = Natural log values of total assets

LEV_{it} = Total amount of debt divided by equity

ROA_{it} = Net income divided by total assets

R&D_{it} = R&D cost divided by sales

GRW_{it} = Total assets growth year on year

FirmAge_{it} = Natural log values of the number of days listed

BIG4_{it} = Dummy variables with a value of 1 if the audit firm is one of the BIG 4 (Samil, Samjeong, Anjin, Hanyoung), and otherwise 0.

ΣIND : Industrial dummy variables

ΣYEAR : Year dummy variables

Here, if β_1 of manager-governance variable, which is independent variable, has a statistically significant positive value, H1 is supported. Therefore, managers with higher influence do not respond to short-term maintenance costs, but are expected to perform business activities from a long-term perspective. The following equation (2) is the verification model of H2.

$$\begin{aligned} \text{Sticky_}(1),(2)_{i,t} &= a_0 + \beta_1 \text{OverConf_}(1),(2),(3)_{i,t} + \beta_2 \text{SIZE}_{i,t} + \beta_3 \text{LEV}_{i,t} + \beta_4 \text{ROA}_{i,t} + \beta_5 \text{R\&D}_{i,t} \\ &+ \beta_6 \text{GRW}_{i,t} + \beta_7 \text{FirmAge}_{i,t} + \beta_8 \text{BIG4}_{i,t} + \sum \text{IND} + \sum \text{YEAR} + \varepsilon_{i,t,t} \end{aligned} \quad (2)$$

OverConf_{(1),(2),(3)}_{HoA} : Three measurements of managerial overconfidence

OverConf₍₁₎_{HoA} = A measurement of managerial overconfidence measured by the method of Ahmed and Dullman (2013). Dummy variables have a value of 1 if the managerial overconfidence is higher than the median, and otherwise 0.

OverConf₍₂₎_{HoA} = A measurement of managerial overconfidence measured by the method of Schrand and Zechman (2012). Dummy variables have a value of 1 if the managerial overconfidence is higher than the median, and otherwise 0.

OverConf₍₃₎_{HoA} = A measurement of managerial overconfidence measured by the method of Ahmed & Dullman (2013) and Schrand & Zechman (2012). Dummy variables have a value of 1 if the managerial overconfidence is higher than the median, and otherwise 0.

Here, if β_1 of the managerial overconfidence [OverConf_(1),(2),(3)] variable, which is independent variable, has a statistically significant positive (+) value, H2 is supported. Therefore, managers with higher overconfidence do not respond to short-term maintenance costs, but are expected to perform business activities from a long-term perspective under confidence in their own judgment. The following equation (3) is the verification model of H3.

$$\begin{aligned} \text{Sticky}_{(1),(2),i,t} &= \alpha_0 + \beta_1[\text{CPS}_{i,t} \times \text{OverConf}_{(1),(2),(3)}] + \beta_2\text{CPS}_{i,t} + \beta_3\text{OverConf}_{(1),(2),(3)}_{i,t} \\ &+ \beta_4\text{SIZE}_{i,t} + \beta_5\text{LEV}_{i,t} + \beta_6\text{ROA}_{i,t} + \beta_7\text{R\&D}_{i,t} + \beta_8\text{GRW}_{i,t} + \beta_9\text{FirmAge}_{i,t} + \beta_{10}\text{BIG4}_{i,t} \\ &+ \sum \text{IND} + \sum \text{YEAR} + \varepsilon_{i,t}, \end{aligned} \quad (3)$$

$\text{CPS}_{\text{H}\alpha\text{A}} \times \text{OverConf}_{\text{H}\alpha\text{A}}(1),(2),(3)$ = the interaction between CEO power and managerial overconfidence[OverConf_{H α A}(1),(2),(3)].

Here, if β_1 of the interaction variable [CPS_{i,t} × OverConf_(1),(2),(3)] between CEO influence (CPS) and overconfidence tendency [OverConf_(1),(2),(3)], which is independent variable, has a statistically significant positive value, H3 is supported. Therefore, managers with higher influence and overconfidence do not respond to short-term maintenance costs, but are expected to perform business activities from a long-term perspective under strong leadership and confidence in their own judgment.

3.3. Operational Definition of Variables

3.3.1. Dependent Variable: Cost Stickiness

Most precedent studies on cost behavior have used the methodology of Anderson et al. (2003) to measure cost behavior. However, this defines cost stickiness as the increase rate of costs when sales increase is greater than the decrease rate of costs when sales decrease, and has the limitation that cost changes for direct sales changes cannot be measured at the individual company level. Thus, this study uses both the methodology of Homburg and Nasev (2008), which can measure cost stickiness at the individual company level, and the methodology of Weiss (2010) as a compensation and revision method.

Methodology of Homburg and Nasev (2008): The methodology of Homburg and Nasev (2008) is used to measure cost stickiness. They measured the ratio increase of SG&A cost for sales when sales decreased from the previous year in Formula (4) as cost stickiness. In Equation (4), the ratio of costs for current year sales has greater value than the ratio of costs for previous year sales unless the production cost was aggressively reduced when sales decreased, so companies with cost stickiness show a positive (+) value (Park Yeon-hee, Koo Jung-Ho and Pae Su-Il, 2012). Therefore, in this study, cost stickiness measured with the methodology of Homburg and Nasev (2008) was given a value of 1 if positive(+), and 0 if negative(-).

$$\text{Sticky}_{(1)_{i,t}} = \text{Cost Signal}_{i,t} \times \text{DSale}_{i,t} \times \text{DCost}_{i,t}, \quad (4)$$

Sticky_(1)_{i,t}: Homburg and Nasev(2008) stickiness of firm i, year t;

Cost_Signal_{i,t} = [Cost_{i,t} / Sales_{i,t}] - [Cost_{i,t-1} / Sales_{i,t-1}]

DSales_{i,t}: Dummy variables with a value of 1 if sales are smaller than those of the previous year, otherwise 0.

DCost_{i,t}: Dummy variables with value of 1 if cost_signal is smaller than zero, otherwise 0.

Methodology of Weiss (2010): In the following equation (5) in the methodology of Weiss (2010), cost stickiness was defined as the difference between the cost increase rate of the latest quarter when sales increased and the cost decrease rate of the latest quarter when sales decreased. In other words, in equation (5), cost stickiness is the difference between the cost increase rate (slope of cost function) when sales increased in the latest quarter and the cost decrease rate (slope of cost function) when sales decreased in the latest quarter during 16 quarters (from t-3 year to t year). Therefore, if there is cost stickiness, the cost increase rate when the sales increase is greater than the cost decrease rate when sales decrease, so the measured value is negative. Thus, in this study, cost stickiness was adjusted to be high if the measured value was positive when the measured value was multiplied by a negative value, and cost stickiness was low if the measured value was negative to enhance the recognition degree of the results, and to accord with the measured value of the methodology of Homburg and Nasev (2008).

$$\text{Sticky}_{it}^{(2)} = \text{Log}(\Delta\text{Cost} / \Delta\text{Sales})_{i,\gamma} - \text{Log}(\Delta\text{Cost} / \Delta\text{Sales})_{i,\mu} \quad (5)$$

$\gamma, \mu \in \{t, \dots, t-3\}$

3.3.2. Independent Variable: Managerial Attributes

CEO Power: CEO power was measured with the methodology of Kwak Young-Min and Kim Hyun-Jin (2017), a revised form of the methodology of Bebchuk et al. (2011) for the situation of Korea. Bebchuk et al. (2011) measured CPS and understood it as the influence of the CEO. To measure CPS, we defined ‘manager’ as a top ranked full-time executive with the job title of ‘CEO’. Based on compensation data of individual executives, CPS was measured as the percentage of CEO total pay in the total pay of all registered full-time executives.

Managerial Overconfidence: Managerial overconfidence is a human characteristic, and it is related to an individual’s thinking, so it is not easy to measure objectively. There are some overseas studies that measure managerial overconfidence. First, the study of Hribar and Yang (2013) measured manager media exposure and overconfidence tendency. However, manager media exposure can be affected not only by their own will but also by external factors, so it is subjective. Second, in studies of Malmendier and Tate (2005), Malmendier and Tate (2008), and Chen et al. (2013), managerial overconfidence was measured with stock option exercise behaviors. Nonetheless, in Korea, manager stock options are provided in very limited industries and companies, so it is not sufficient for empirical analysis (Kim Saerona and Yoo Hye-Yeong, 2014). Third, Ahmed and Duellman (2013) measured managerial overconfidence with capital expenditure size for industry average based on Malmendier and Tate (2005), which claimed that managers that were overconfident about profits engaged in more capital expenditures. Fourth, Schrand and Zechman (2012) performed regression analysis on sales growth rate (independent variable) and asset growth rate (dependent variable) by each industry and year, extracted residuals, and then considered companies with a positive residual value as having managers with high overconfidence because they invested more in asset expansion than other companies in the same industry.

Therefore, this study measures managerial overconfidence with the use of the methodologies of Ahmed and Duellman (2013) and Schrand and Zechman (2012). The measured values based on the two methodologies are dummy variables, and are 1 if managerial overconfidence is high, otherwise 0. In addition, in both the methodologies of Ahmed and Duellman (2013) and Schrand and Zechman (2012), if managerial overconfidence is high, the measured value is 1, otherwise 0, which are used for additional

analysis. Therefore, there are three measured values of managerial overconfidence in this study.

3.3.3. Control Variables

In this study, the variables that can affect cost stickiness are included to control variables. First, size of company (hereinafter referred to as SIZE) is measured with the natural log value of basic total assets (Lee kyun-Bong, 2018). Second, debt ratio (hereinafter referred to as LEV) is measured with the value of total debt divided by owned capital (Park Jeong-Hwan, 2019). Third, return on assets (hereinafter referred to as ROA) is measured with current year sales cash divided by total basic assets (Han Young-Hee, 2019). Fourth, R&D cost is measured with total R&D cost divided by sales (Lee Gyun-bong and Ryu Ye-Rin, 2019). Fifth, growth rate of total assets (hereinafter referred to as GRW) is measured by the current year total asset growth rate compared to the previous year (Park Jeong-Hwan and Ryu Ye-Rin, 2018). Sixth, the period of listing (hereinafter referred to as Firm Age) was measured with the natural log value of total listing days (Yang Hae-Myun and Rho Gil-Kwan, 2019). Seventh, size of audit companies (hereinafter referred to as BIG4) is a dummy variable; the value is 1 if a company was audited by Samil, Samjeong, Anjin, and Hanyeong, and otherwise is 0 (Park Ju-Cheol, 2019).

4. Analysis and Results

4.1. Descriptive Statistics

Table 3 are the descriptive statistics of the major variables. The average values of cost stickiness values, which is the dependent variable, are approximately 0.008 [Sticky_(1)] and 0.272 [Sticky_(2)]. Next, the average value of manger governance (CPS) among independent variables is about 0.505, so managers in Korea receive about half of whole pay amounts. In addition, the average value of managerial overconfidence was about 0.355 [OverConf_(1)], 0.347 [OverConf_(2)] and 0.314 [OverConf_(3)].

Table 3. Descriptive Statistics

	Mean	Median	Std. Deviation	25%	75%
Sticky_(1)	0.008	0.000	0.031	0.000	0.006
Sticky_(2)	0.272	0.241	1.810	-0.658	1.248
CPS	0.505	0.504	0.198	0.378	0.644
OverConf_(1)	0.355	0.000	0.479	0.000	1.000
OverConf_(2)	0.347	0.000	0.477	0.000	1.000
OverConf_(3)	0.314	0.000	0.464	0.000	1.000
SIZE	28.034	27.858	1.603	26.882	29.120
LEV	0.487	0.502	0.193	0.333	0.638
ROA	0.050	0.047	0.045	0.026	0.070
R&D	0.005	0.001	0.010	0.000	0.006
GRW	0.041	0.038	0.099	-0.008	0.090
FirmAge	8.742	8.967	0.882	8.246	9.525
BIG4	0.813	1.000	0.391	1.000	1.000

The descriptive statistics of the control variables are as follows. The average value of LEV was about 48.7%, and the average value of ROA was approximately 0.050. The average of R&D was about 0.005, which indicates that about 0.5% of total sales are spent on R&D. The average value of GRW was about 0.041, and about 81.3% of all sample companies are audited by the BIG 4. Meanwhile, when standard deviation is considered, the average and median values are not very different, so there is no problem in assuming a normal distribution of research samples.

4.2. Correlation Analysis

Table 4 shows the results of Pearson correlation analysis among research model variables prior to the verification of the research hypotheses, and this is the bivariate correlation coefficient with the influence of control variables uncontrolled. The results are as follows.

First, CEO power and cost stickiness (2) [Sticky_(2)] have a positive correlation at the 5% level. Therefore, when CEO power was higher, cost stickiness was expected to be higher according to the methodology of Weiss (2010). Second, the correlation result of managerial overconfidence and cost stickiness is as follows. First, the measured value of managerial overconfidence (1) [OverConf_(1)] and cost stickiness (2) [Sticky_(2)] have a positive correlation at a 10% significance level. In addition, the measured value of managerial overconfidence (2) [OverConf_(2)] and cost stickiness (1) [Sticky_(1)] show a positive correlation at the 10% level. The measured value of managerial overconfidence (3) [OverConf_(3)] and cost stickiness (2) [Sticky_(2)] show a positive correlation at the 10% level.

Thus, when managerial overconfidence was higher, cost stickiness was expected to be higher. In the above results, the effects of control variables that are expected to affect export company cost stickiness are not considered, so there is limit in the interpretation (Kim Ji-Young and Ji Sang-Hyun, 2018).

Table 4. Pearson Correlation

	Sticky_(1)	Sticky_(2)	CPS	OverConf_(1)	OverConf_(2)	OverConf_(3)	SIZE	LEV	ROA	R&D	GRW	FirmAge
CPS	0.048	.099**										
	0.282	0.026										
OverConf_(1)	0.039	0.046	-0.006									
	0.377	0.300	0.886									
OverConf_(2)	0.064	0.032	-0.007	.836***								
	0.152	0.472	0.871	0.000								
OverConf_(3)	0.052	0.047	-0.012	.911***	.927***							
	0.240	0.292	0.788	0.000	0.000							
SIZE	-0.068	-0.033	-0.053	.093**	0.056	0.067						
	0.129	0.452	0.232	0.037	0.207	0.132						
LEV	0.032	-0.039	0.007	0.019	-0.032	-0.006	.369***					
	0.470	0.380	0.878	0.666	0.473	0.896	0.000					
ROA	-.120***	0.022	0.082*	.170***	.224***	.199***	-0.038	-.343***				
	0.007	0.624	0.065	0.000	0.000	0.000	0.397	0.000				
R&D	.099**	-0.064	0.044	.106**	.105**	.108**	0.053	-0.005	-0.037			
	0.026	0.149	0.325	0.017	0.018	0.015	0.231	0.919	0.403			
GRW	-.120***	-0.080*	0.023	.089**	.126***	.119***	0.003	0.001	0.081*	0.025		
	0.007	0.073	0.613	0.045	0.005	0.007	0.938	0.978*	0.070	0.580		
FirmAge	0.067	-0.027	-0.018	-.126***	-0.079*	-.093**	0.066	0.062	-.214***	0.051	-.134***	
	0.136	0.553	0.687	0.005	0.078	0.038	0.143	0.168	0.000	0.254	0.003	
BIG4	0.036	0.019	0.048	0.054	0.036	0.027	.222***	-0.043	.097**	0.033	0.006	0.012
	0.416	0.676	0.279	0.223	0.424	0.542	0.000	0.329	0.029	0.465	0.896	0.793

Notes: *, **, *** Significant in significance levels of 10%, 5%, 1% respectively.

4.3. Results of Hypothesis Tests

4.3.1. CEO Power and Cost Stickiness

Table 5 shows the results of verifying the relationship between CEO influence and cost stickiness. The results are as follows. First, CPS shows a positive relationship with cost stickiness (1) [Stick_(1)] at an insignificant level. Second, CPS shows a positive relationship with cost stickiness (2) [Stick_(2)] at the 5% level. The coefficient value was 0.841, which is very high; the greater CEO power, the higher cost stickiness. Therefore, H1 is partially supported.

Next is the result of analyzing control variables. First, ROA shows a negative relationship with cost stickiness (1) [Stick_(1)] at the 1% level, which indicates that export companies with ROA flexibly reduce expenditure in preparation for a reduction of sales. Second, R&D cost shows a positive relationship with cost stickiness (1) [Stick_(1)] at the 10% level, thereby indicating that companies with greater R&D investments spend a certain amount on R&D costs regardless of sales, so cost stickiness is relatively high. Third, GRW shows a positive relationship with cost stickiness (1) [Stick_(1)] at the 5% level, thereby indicating that export companies with higher growth rates maintain a certain level of expenditure, which can be a driver of continuous growth. Fourth, BIG4 has a negative relationship with cost stickiness (1) [Stick_(1)] at the 5% level, and with cost stickiness (2) [Stick_(2)] at the 10% level.

Table 5. CEO Power and Cost Stickiness

	Dependent Variable: Cost Stickiness					
	Sticky (1)			Sticky (2)		
	Coef.	t	P	Coef.	t	P
Intercept	0.003	0.349	0.727	-0.403	-0.227	0.821
CPS	0.005	1.447	0.148	0.841	2.022	0.044
SIZE	0.010	0.212	0.832	0.043	0.670	0.503
LEV	-0.004	-1.478	0.140	-0.321	-0.651	0.515
ROA	-0.029	-2.810	0.005	-0.259	-0.124	0.902
R&D	0.072	1.769	0.077	-9.906	-1.211	0.227
GRW	-0.009	-2.116	0.035	-1.052	-1.191	0.234
FirmAge	0.000	0.967	0.334	-0.083	-0.865	0.388
BIG4	-0.003	-2.111	0.035	-0.452	-1.803	0.072
IND/YEAR		Included			Included	
Adj-R ²		0.064			0.013	
F-value		4.136***			1.282***	
Sample		Sample <1-1>			Sample <1-2>	

Notes: *, **, *** The correlation coefficient is significant at the levels of 0.10, 0.05 and 0.01; The maximum value of VIF is 4.046

4.3.2 Managerial Overconfidence and Cost Stickiness

Table 6 presents the results of verifying the relationship between managerial overconfidence and cost stickiness. First, managerial overconfidence (1) [OverConf_(1)], managerial overconfidence (2) [OverConf_(2)], and managerial overconfidence (3) [OverConf_(3)] had positive relationships with cost stickiness (1) [Stick_(1)].

Second, managerial overconfidence (1) [OverConf_(1)] showed a positive relationship with cost stickiness (2) [Stick_(2)]. Managerial overconfidence (2) [OverConf_(2)] showed a positive relationship with cost stickiness (2) [Stick_(2)] at the 10% level. Managerial overconfidence (3) [OverConf_(3)] showed a positive relationship with cost stickiness (2) [Stick_(2)] at the 5% level. Therefore, H2 was supported only in an analysis when the methodology of Weiss (2010) used.

Table 6. Managerial Overconfidence and Cost Stickiness

<u>Dependent Variable: Cost Stickiness</u>						
	<u>Sticky (1)</u>			<u>Sticky (2)</u>		
	Coef.	t	P	Coef.	t	P
Intercept	0.023	2.600	0.009	-0.230	-0.229	0.819
OverConf_(1)	0.001	0.561	0.575	0.174	1.462	0.144
SIZE	0.000	-0.920	0.358	0.033	0.910	0.363
LEV	-0.006	-2.713	0.007	-0.051	-0.177	0.859
ROA	-0.086	-9.748	0.000	-2.016	-1.561	0.119
R&D	0.114	2.941	0.003	1.495	0.271	0.786
GRW	-0.008	-2.157	0.031	-0.152	-0.298	0.765
FirmAge	-0.000	-0.593	0.553	-0.000	-0.006	0.995
BIG4	-0.001	-1.418	0.156	-0.155	-1.226	0.221
IND/YEAR	Included			Included		
Adj-R ²	.078			.031		
F-value	10.297***			2.490***		
Sample	Sample <2-1>			Sample <2-2>		

<u>Dependent Variable: Cost Stickiness</u>						
	<u>Sticky (1)</u>			<u>Sticky (2)</u>		
	Coef.	t	P	Coef.	t	P
Intercept	0.023	2.612	0.009	-0.231	-0.230	0.818
OverConf_(2)	0.001	0.916	0.360	0.216	1.767	0.078
Control Variables	Included			Included		
Adj-R ²	.078			.032		
F-value	10.319***			2.530***		
Sample	Sample <2-1>			Sample <2-2>		

<u>Dependent Variable: Cost Stickiness</u>						
	<u>Sticky (1)</u>			<u>Sticky (2)</u>		
	Coef.	t	P	Coef.	t	P
Intercept	0.023	2.573	0.010	-0.229	-0.229	0.819
OverConf_(3)	0.001	1.586	0.113	0.168	2.174	0.030
Control Variables	Included			Included		
Adj-R ²	.078			.033		
F-value	10.305***			2.577***		
Sample	Sample <2-1>			Sample <2-2>		

Notes: *, **, *** The correlation coefficient is significant at the levels of 0.10, 0.05 and 0.01; The maximum value of VIF is 4.050.

4.3.3. CEO Power, Managerial Overconfidence, and Cost Stickiness

Table 7 shows the results of verifying the relationship between cost stickiness and the interaction of CEO influence and managerial overconfidence. First, the interaction variable (1) [CPS×OverConf_1] of CEO power (CPS) and CEO overconfidence(1) had a positive (+) relation with cost stickiness (1) [Stick_1] at a statistically insignificant level. However, CEO power (CPS) showed a positive relationship with cost stickiness (1) [Stick_1] at the 10% level.

Another interaction variable, (2) [CPS×OverConf_2] of CEO power (CPS) and managerial overconfidence(2), also showed a positive relationship with cost stickiness (1) [Stick_1] at a statistically insignificant level. CEO power (CPS) showed a positive relationship with cost stickiness (1) [Stick_1] at the 10% level.

The third interaction variable (3) [CPS×OverConf_3] of CEO power (CPS) and managerial overconfidence (3) also showed an insignificantly positive relationship with cost stickiness(1) [Stick_1]. Nevertheless, CEO power (CPS) had a positive relationship with cost stickiness (1) [Stick_1] at the 10% level.

Second, the interaction variable (1) [CPS×OverConf_1] of CEO power (CPS) and managerial overconfidence (1) had an insignificant positive relationship with cost stickiness (2) [Stick_2]. Nonetheless, CEO power (CPS) had a positive relationship with cost stickiness (2) [Stick_2] at the 5% level.

Another interaction variable (2) [CPS×OverConf_2] of CEO power (CPS) and managerial overconfidence(2) showed a positive relationship with cost stickiness (2) [Stick_2] at the 5% level. In addition, CEO power (CPS) had a positive relationship with cost stickiness (2) [Stick_2] at the 5% level.

The third interaction variable (3) [CPS×OverConf_3] of CEO power (CPS) and managerial overconfidence (3) showed a positive relationship with cost stickiness (2) [Stick_2] at the 5% level. In addition, CEO power (CPS) showed a positive relationship with cost stickiness (2) [Stick_2] at the 5% level.

Accordingly, when CEO power was greater, and managerial overconfidence was higher, cost stickiness was higher, so cost stickiness is expected to appear differently depending on managerial attributes. Thus, Hypothesis 3, which verifies the relationship between cost stickiness and the interaction variable of CEO power and managerial overconfidence, is supported only in the analysis with the methodology of Weiss (2010).

According to the above hypothesis verification, when CEO power was greater, managerial overconfidence was higher, and both CEO power and managerial overconfidence were higher, cost stickiness was higher. This means cost behavior can appear differently depending on managerial attributes.

Table 7. Relationships among Cost Stickiness, CEO Power, and Managerial Overconfidence

Dependent Variable: Cost Stickiness						
	Sticky (1)			Sticky (2)		
	Coef.	t	P	Coef.	t	P
Intercept	0.001	0.139	0.890	-0.540	-0.304	0.761
CPS×OverConf_(1)	0.001	1.420	0.156	0.462	1.513	0.131
CPS	0.001	1.733	0.084	0.968	2.277	0.023
SIZE	0.001	0.282	0.778	0.051	0.796	0.426
LEV	-0.004	-1.472	0.141	-0.271	-0.548	0.584
ROA	-0.028	-2.724	0.007	-0.031	-0.015	0.988
R&D	0.074	1.820	0.069	8.571	1.042	0.298
GRW	-0.009	-2.062	0.039	-0.956	-1.081	0.280
FirmAge	-0.000	-0.886	0.376	-0.094	-0.979	0.328
BIG4	-0.003	-2.148	0.032	-0.486	-1.933	0.054
IND/YEAR		Included			Included	
Adj-R²		0.065			0.015	
F-value		4.161***			1.315***	
Sample		Sample <1-1>			Sample <1-2>	

Dependent Variable: Cost Stickiness						
	Sticky (1)			Sticky (2)		
	Coef.	t	P	Coef.	t	P
Intercept	0.002	0.181	0.857	-0.496	-0.279	0.780
CPS×OverConf_(2)	0.001	1.588	0.113	0.401	2.062	0.040
CPS	0.001	1.769	0.077	0.954	2.236	0.026
Control Variables		Included			Included	
Adj-R²		0.064			0.013	
F-value		4.141***			1.288***	
Sample		Sample <1-1>			Sample <1-2>	

Dependent Variable: Cost Stickiness						
	Sticky (1)			Sticky (2)		
	Coef.	t	P	Coef.	t	P
Intercept	0.002	0.177	0.859	-0.516	-0.291	0.771
CPS×OverConf_(3)	0.000	1.531	0.126	0.491	2.177	0.035
CPS	0.001	1.947	0.052	0.960	2.265	0.024
Control Variables		Included			Included	
Adj-R²		0.064			0.015	
F-value		4.139***			1.315***	
Sample		Sample <1-1>			Sample <1-2>	

Notes: *, **, *** The correlation coefficient is significant at the levels of 0.10, 0.05 and 0.01; The maximum value of VIF is 1.664.

5. Discussion

5.1. Research Results

COVID-19 was a crisis for the Korean economy and export industry. The travel limitations and self-quarantine obligations hampered the business activities of export companies. If each country reinforces protective trade policies in order to promote the domestic economy, the external environments of export companies will be worsened. Nevertheless, Korean export companies tried to overcome these difficulties by exerting potential energy to change crisis into opportunity. Fields such as eco-friendly automobiles, semiconductors, computers and bio-health, whose demands have increased since the spread of COVID-19, have increased sales thanks to the prompt crisis response of managers. The bio-health field, which is considered a future food source, shows very different performance depending on manager responses.

In times of crisis, managers are more important. The growth of a company can be very different after a crisis situation is over depending on how an export manager copes with the crisis. Therefore, our study focuses on managers whose importance was more emphasized in recent circumstances. It focuses on managerial attributes, which are classified into CEO power with external characteristics and managerial overconfidence as internal characteristics, and verifies the effects of these characteristics on cost behavior.

For CEO power, the measured value of CPS presented by Bebchuk et al. (2011) was used, and for managerial overconfidence, the measured value of managerial overconfidence presented by Ahmed and Dullman (2013) and Schrand and Zechman (2012) was used. In addition, for cost stickiness, the measured value of cost stickiness presented by Homburg and Nasev (2008) and Weiss (2010) was used. In calculating each measured value, total four research samples are organized in order to control the difference of omission samples.

The results of our study are as follows. First, when CEO power in export company was greater, cost stickiness was greater. This means that managers with high influence did not respond to temporary sales decreases immediately, and did not reduce related production costs flexibly in preparation for future sales recovery, but endured costs for idle resources. Second, when managerial overconfidence was higher, cost stickiness was greater. This indicates that managers with greater confidence in their decision making were optimistic about future sales recovery, so they did not reduce related production costs in preparation for future sales recovery, but endured costs for idle resources. Third, when CEO power was greater, and managerial overconfidence was greater in decision making, cost stickiness was higher. This means when CEO power and managerial overconfidence were greater, the two factors comprehensively work together, resulting in greater cost stickiness. Our study is expected to provide useful information to future management predictions of exporters by reporting that the greater CEO power and overconfidence, the more aggressive export strategies they choose.

In addition, it can serve as an opportunity to expand export management-related studies by expanding managerial overconfidence related precedent studies and by providing additional information. This study intended to secure the robustness of research results using various values in measuring major variables and subdividing research samples according to the measured values.

5.2 Implications for Start-ups

Recently, because of COVID-19, a global demand slump, economic recession, and the fourth industrial revolution have occurred. This business environment is clarifying the

existing large-scale export structure and the limits of quantitative growth. In this situation, relatively small and medium-sized start-ups with the world's best technology are finding a way to recover exports. Specifically, the growth of start-ups can play a role as the middle of the domestic corporate ecosystem, and is expected to revitalize the export structure centered on large companies, facing the limits of quantitative growth.

In reality, start-ups are responsible for more than 20% of exports to new industries, such as next-generation semiconductors, bio-health, robots, aviation, and drones. By country, exports to China have steadily declined, and exports to advanced countries such as the U.S. and some European countries have continued to rise and diversify based on technology, in contrast to large companies that still show high Chinese dependence.

Start-ups have succeeded in overseas markets based on technology with consistent R&D investments, regardless of whether sales are strong or sluggish, under the common perception that the technology is competitive. Specifically, from the beginning of firm establishment, it has been shown making efforts to commercialize products, such as product concepts and designs, can lead to increased sales.

Nonetheless, there are concerns that future growth will be delayed through a closed research and development method centered on self-development, with a lower proportion of R&D investment compared to large firms and small and medium-sized start-ups. To foster more small and medium-sized start-ups with global technology, the Korean government should expand policy support, such as taxation related to corporate R&D, and provide continuous technology development power through open innovation using external networks.

In addition, start-ups often have a greater influence on management decisions by CEOs than large firms. The results of this study indicated that the greater the influence of the CEO, the greater cost stickiness, and that the greater the overconfidence tendency and the greater the combination of the two factors, the greater cost stickiness. Therefore, we believe that the managerial attributes of a start-up could be an important factor in the success of the firm.

5.3. Research Limitations

The limitation of our current research is indicated as follows. First, research results could be different according to the sample used for analysis. In the present research, the sample is limited because of the increase in many firms removed in the process of calculating various values. Second, research results could be different depending on the measurements of cost stickiness that researchers employ. Therefore, future research should check the robustness of our research results with different measures of cost stickiness. Finally, in calculating CPS information to measure CEO power, we did not include pay information of non-registered executives after 2017. This choice could be disadvantageous in the reliability of measured values. Thus, there should be a follow-up study with the latest pay information of executives added.

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