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Corporate Board Committees and Asymmetric Behavior of Total Cost: Evidence from Pakistan

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ABSTRACT:

For managers, management accountants, and financial analysts, understanding how costs work is a crucial and important challenge. Using agency theory, this paper answers the empirical question of whether corporate board committees can help to explain the asymmetric behavior of total cost (TC) of the firms listed in Pakistan Stock Exchange (PSX) as managerial conduct. Using a panel data regression model, we analyzed the data for the period 2014 to 2018 to evaluate the interaction effect of management corporate board committees on asymmetric cost behavior of total cost of 86 companies. Results show that total cost behave anti-sticky. But corporate board committees have no significant interaction with TC behavior.

This study contributes to the management characteristics of one of the emerging economies by presenting proof of asymmetric cost behavior. In addition, the research expands the very few studies on the relationship between corporate board committees and asymmetric behavior of costs.

INTRODUCTION:

In terms of activity/volume adjustment, costs are required to react symmetrically. Traditional model of cost behavior explain the inequality by adjusting the degree of the cost behavior. These costs behave symmetrically; this ensures that the output variant is similarly proportionate to the amount of the cost drivers. Fixed cost, however, does not react to the difference in the degree of the cost driver.

Anderson, Banker, and Janakiraman (2003) firstly reported that sale, general and administrative costs (SG&A) do not adjust linearly to changes in production level; alternatively, when activity level rises, SG&A costs rise faster than when activity level declines. This tendency is referred to as stickiness in SG&A costs or asymmetry in SG&A costs. As Anderson *et al*. (2003) assume, the concept of cost stickiness can be interpreted from two aspects: (1) the economic theory of sticky costs, this identifies cost stickiness as the result of the intentional resource allocation decisions of managers, and (2) the agency theory, which relates the phenomenon to the advantages of personal empire-building incentives of managers.

Costs are sticky because of structural factors that have an effect to slow down the downward adjustment rather than the upward adjustment of total cost (TC), according to the economic principle of cost stickiness. Such forces have included a permanent downturn in revenue, macroeconomic growth, and the strength of assets and staff, as reported by Anderson *et al* (2003). Other economic factors that influence the degree of cost stickiness have been established by subsequent studies.

Balakrishnan, Petersen, and Soderstrom (2004) demonstrate that when an organization has stressed capacity, costs display greater stickiness: to alleviate dependency on available capital, it appears to raise resources in response to the growing activity, but when operations decrease, it is less likely to slash resources. Balakrishnan and Gruca (2008) claim that the cost of change

identified with alteration the level of capability of core activities. It is greater than that affiliated with additional and support activities and, as a consequence, costs are greater when compared with supplementary and support activities.

In recent research, all costs is responding asymmetrically; that is, all costs may react differently as activity/production rises or decreases. This reflects the sticky expense actions (Anderson *et al.,* 2003). Conversely, it is found that costs increase less compared to an increase in activity than they decrease by an equal ratio in response to a reduction in activity/sales/demand. This illustrates anti-sticky price actions (Weiss, 2010; Balakrishnan *et al*., 2014). Another research undertaken by Chen *et al*. (2012) showed that the asymmetric cost action is committed by opportunistic managers.

The corporate governance (CG) and cost of goods sold (COGS) relationship was discovered by Ibrahim (2018). Another research established a link between CG and SG&A (Chen *et al.,* 2012) and it is also verified the interaction with CG and operational cost (OC) in most new research (Ali *et al*., 2020). However, other costs such as total cost (TC) are very relevant that the interaction with CG still needs to be studied. There are also other considerations that are perceived to be the most significant components of CG, such as the features of the audit committee, the number of committees, and different ownership arrangement variables (Ibrahim, 2018). Therefore, this research would like to add efforts in analyzing the asymmetric cost behavior of Pakistani companies like TC. This study further contributes by analyzing TC interaction with the features of the board committee. In addition, this research helps to find the correlation between managerial incentives and asymmetric behavior of TC.

Researchers and practitioners will get benefit from the results of this study. First of all, this research confirmed and complemented previous research by analyzing the rigidity of underdeveloped countries like Pakistan. This study allows scholars to be using interdisciplinary methods, integrating management and financial accounting viewpoints and investigating diverse scientific topics. In the field of corporate governance and asymmetric knowledge, there is comprehensive and detailed research. Nevertheless, there is no evidence

associated with regulating or reducing asymmetric knowledge regarding the role of corporate governance structures. Unlike previous research, it offers a detailed analysis of the relationship of asymmetric knowledge with corporate governance.

While there is no evidence of an association between corporate governance and asymmetric cost variables, this analysis aims to determine the strongest mix of corporate governance committees that can influence the possibility of asymmetry cost. No prior studies have been conducted to identify the best mix of corporate governance committees to fix structural challenges and minimize asymmetric cost. The earlier work was just an effort to connect the processes of corporate governance and their influence on value or asymmetric cost.

This study examines four board committee's characteristics; overlapping members in Audit and HR/remuneration committee, number of overlapping members in committees, number of committees and average member in committees. It also find out the potential impact of features of board committees on TC. The research sample consist on Pakistani's companies.

The theoretical and philosophical foundations of board committee mechanisms and TC behavior are explored in chapter two. The methodology is discussed in Chapter three. The descriptive analysis, Pearson correlation, unit root test, co-integration test and multiple regression analysis are discussed in chapter 4. The contribution of current literature, research constraints, and recommendations for future research are defined in chapter 5.

Literature Reviews

It is proofed that an important oversight role is performed by board committees. It indicates that by appointing directors to critical monitoring committees, corporations could be able to mitigate the costs associated with larger boards (Reeb & Upadhyay, 2020). Larger boards are expected for businesses with diverse business models (Coles *et al.*, 2008; Linck *et al.,* 2008). Another research sated that businesses with larger boards and audit committees have lower debt cost (Anderson *et al.,* 2004). There is an effect on accounting honesty on the scale of the audit committee or other oversight committees (Anderson *et al.,* 2004), which in turn will reduce the perception

of risk. These committees derive their power of oversight from the power assigned by the board to them. For example, the audit committee is responsible for nominating external auditors, for overseeing the internal audit function and for maintaining the integrity of the auditor; for authorizing and monitoring long-term plans and the HR/remuneration committee are responsible for reviewing the company's management compensations and procedures. From above it is concluded that committees are subgroups of directors sitting on board, for the purpose of distinct reasons.

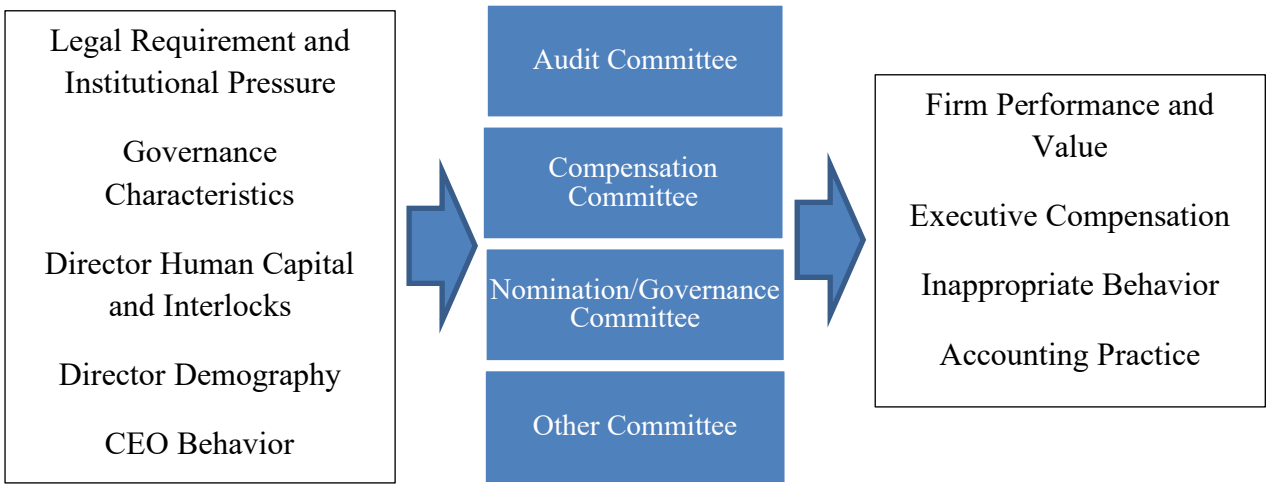

Figure 1: Overviews of Board Committees

Since these studies found out that the configuration of the board committees could affect. This research emphasis that how board committee's structure speed up the decision-making of larger and independent companies. In specific, where organizations use board committees to assign significant monitoring roles, this study find the relationship between board structure and firm asymmetric cost behavior.

A model which help to examine that costs behave asymmetrically (Anderson et al., 2003), where most of the researchers follow their model. A study in Tehran, the findings of this research show that administration and distribution costs are sticky; it is not proportional to the shift in revenue and the level of economic activity. (Salehi *et al.,* 2018).

Hypotheses Development

A study in Pakistan, proved that SG&A cost behave anti-sticky it rise by Rs.0.20, but fall by Rs.1.17 in response of Rs.1 change in sales. Moreover, it also described that Economic situation also affects the behavior of cost stickiness (Ali & Shafique, 2020). Abu-Serdaneh (2014) revealed in his study that SG&A costs respond symmetric behavior and COGS looks anti-sticky, by examining all listed manufacturing companies in Jordan during 2008-2012. However, in Egyptian CGS behave asymmetric (Ibrahim *et al*., 2018). In addition, Banker and Byzalov (2014) confirms that operating costs in 16 out of 20 nations are sticky, concluding that asymmetric cost activity is a global phenomenon. In another study, it was investigated the cost activity that is not compatible with previous research. They found that the cost of labour is sticky, but not for COGS, SG&A, or even operating expenses (Dalla Via & Perego, 2014). Adversely, in another studies, the results indicate the stickiness of both SG&A and COGS but operating costs respond anti-sticky (Ibrahim, 2015). Likewise A recent studies conducted in Pakistan, proves that OC is behaved anti-sticky (Ali *et al.,* 2020). The first study, Dierynck *et al*. (2012) find that managers reaching the zero earnings benchmark, it will increase labor cost to little extent when activity increases, when activity fall, it will cause in decreasing labor costs to a larger extent.

From the above, it is extracted following hypotheses

H1: There is no significant difference exist between the rise in TC when sales revenue increase and decline in TC when sales revenue fall.

CG can help mitigate cost stickiness, and that cost stickiness is mitigated by the interaction between CG and earnings management (Xue & Hong, 2016). In addition, board characteristics were found to influence the decisions of managers, and hence cost behavior effect, where all board characteristics analyzed were found to affect cost stickiness in some way (Ibrahim *et al.,* 2018). Board committees should considered while examining the relationship between corporate governance and firm performance. Since such mechanism has potential in order to reduce certain costs that are connected with big and autonomous boards. So, in this study, it needs to be confirmed that whether establishing monitoring committees can alleviate these associated cost with boards or not.

Number of Committees

The majority of independent directors serve on two or more monitoring committees, the quality of board monitoring improves (Faleye *et al.,* 2011). They also found that while the director did not devote enough time providing guidance, this rise was costly. Harrison (1987) suggests that, to legitimize their corporate governance activities, executives should nominate broad board members and form several board committees.

Earlier study has found proof that board committees play an important role in controlling (Anderson *et al.,* 2004; Hadani *et al.,* 2011). Board committees may also consider the relationship between corporate governance and firm performance when reviewing it. Since there is scope for such a mechanism to minimize such costs related to broad and autonomous committees. A recent studies confirmed that number of committees in board (NCB) has significant impact on cost behavior (Ali & Shafqiue, 2020; Ali *et al.,* 2020). It shows anti-sticky behavior with NCB. Therefore, it must be confirmed in this analysis that whether or not the establishing monitoring committees will mitigate these related costs of boards

From the above, this concludes following hypotheses:

H2: NCB has significant relationship with TC behavior.

Average Number of Members in Committee

The composition of the audit committee or other monitoring committee affects the account's credibility (Anderson *et al.,* 2004) and the risk perception can be diminished by adjustments. When the committee is smaller and has a specific mission, it is more likely to encourage such directors' transparency and thereby minimize release concerns. However, if the board has many committees, a favorable association between board size and company success is expected. Members on any of these permanent committees have an average of three or five members. And when they get more outsiders, these committees are more successful (Klein, 1998). The involvement of the committee will also influence the relationship between freedom of the board and solid results. A

recent studies confirmed that average number of members in committees (ANMC) in board has significant impact on cost behavior (Ali & Shafqiue, 2020; Ali *et al.,* 2020; Shafique & Ali; 2020).

On the basis of above, this study conclude following hypothesis:

H3: ANMC has significant relationship with TC behavior.

Overlapped Member in Committee

Habib & Bhuiyan (2016) confirmed in their research that, in situations, where management is more likely to meet or surpass profit margins, overlapping members of the compensation committee and audit committee play a beneficial role. Members of the audit committee with accounting and financial experience will play a valuable role in restricting opportunistic reporting conduct (Dhaliwal *et al.,* 2010; Kent *et al.,* 2016). Therefore, an overlap member, who also present in the compensation committee and the audit committee, has been established as advantageous for the improved sharing of knowledge.

A research on the financial skills of the audit committee confirmed that more members of the audit committee's financial experts enhanced revenue efficiency (Krishnan & Visvanathan, 2007; Dhaliwal *et al.,* 2010), decreased the probability of repeated changes (Marciukaityte & Varma, 2008; Cohen *et al.,* 2010) and increased the likelihood of removing internal vulnerabilities on time (Goh, 2009). A recent studies confirmed that overlapped member in committees (OMC) in board has significant impact on cost behavior (Ali & Shafqiue, 2020; Ali *et al.,* 2020; Shafique & Ali; 2020).

From the above analysis this study postulate following hypotheses:

H4: OMC has significant relationship with TC behavior.

Number of Overlapped Members in Committees

Van der Zahn and Tower (2005) empirically investigate Higgs's (2003) concept that it is sub-optimal to overlap directors. They investigate directors, who overlap between audit committees, remuneration, and nominations, using a sample of firms in Singapore. They observed that boards were less attractive for earning management with greater rate of overlap of participants in

committees. There are, however, certain costs associated with the degree of duplication between members of board committees. The potential advantage of the delegating role to committees, as defined by Laux and Laux (2009), is that using smaller subgroups will minimize the issue of free-riders rather than large groups. The subgroup composition and its advantages would decrease if there is a complete overlapping committee. In addition, high levels of duplication in committees should minimize efforts and remove transparency, which can impact the oversight role of the audit committee. Therefore, the higher degree of inter-committee duplication is not related to the higher quality of the financial statements. Furthermore, research indicates that committee systems have a decreased profit when committees overlap with members and decrease their earnings (Laux & Laux, 2009). A study confirmed that number of overlapped members in committees (NOMC) in board has significant relationship with cost behavior with standalone variables (Ali *et al*., 2020).

H5: NOMC has significant relationship with TC behavior.

Managerial Incentives

Authors investigate incentives for managers that brings variation in cost behavior (Dierynck *et al.,* 2012). It will alleviate the stickiness of cost (Kama & Weiss, 2013). Koo *et al*. (2015) inspects the association between earnings management and cost stickiness. They noticed that managers reduce earning management expenses as activity decreases, but businesses with bonuses for earnings management discovered expense stickiness. A study confirmed that managerial incentives has significant relationship with cost behavior (Shafique & Ali, 2020). Anothet study also indicates that institutional ownership, independence of the board and attempts to take over may mitigate the impact of the agency problem on cost stickiness (Chen *et al.,* 2012).

However, we develop the following hypothesis

H6: Managerial Incentives has significant relationship with TC behavior.

Theoretical Framework

This study extract the following theoretical framework from the above discussion. The figure 2 shows the relationship between Board committee's structures with asymmetric cost behavior. Furthermore, this research also find the impact of managerial incentives on asymmetric cost behavior.

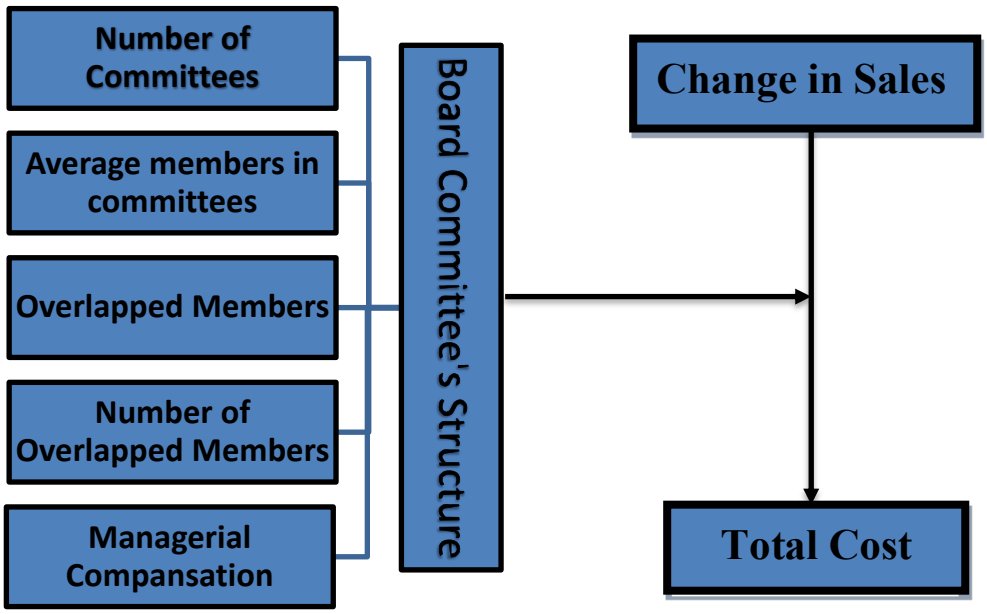

Figure 2: Theoretical Framework

METHODS

This is a quantitative type of research and it helps to find out the relationship between board committee's structures and Cost behavior. The listed companies in the Pakistan Stock Exchange (PSX) are taken as whole population. It is Pakistan's largest stock exchange. It has over 940 listed companies representing over 38 industries. It is the merger of three stock exchange market (Karachi Stock Exchange, Lahore Stock Exchange and Islamabad Stock Exchange). It is appropriated to create a non-probability sample to represent all industries. This studied followed a number of selection criteria, followed by previous literature. First, financial sector and services sectors are excluded due to having differ in capital structure and risk characteristics. Secondly, companies having inappropriate data and facing financial crisis are excluded (Tseng *et al*., 2015; Shafique *et al.,* 2020). Thirdly, if the expenses exceed the income of the current year, such firm are

also excluded and lastly, according to Cannon (2014), extreme observations, where the standardized residual value of each observation exceeds an absolute value of 3. As a result, 86 companies were taken into account as sample. It represent the 19.56% of total population.

Data required in measuring the dependent variable; change in total cost, independent variables; Change in sales, overlapped members in committee, number of overlapped members, number of committees in corporate governance, average members in committees and board compensation collected from the companies audited annual financial reports and their websites for the years 2014-2018. Financial reports are downloaded from Pakistan Stock Exchange (PSX), websites and head offices of companies.

Instruments

Anderson *et al*. (2003) suggest an innovator regression model in order to determine whether an increase in costs is dissimilar from a decrease in costs when the corresponding activity changes. This model is helpful to measure cost reactions to alteration in current sales. It will also help to differentiate the periods of rising and falling sales of a firms (Anderson *et al*., 2003). A dummy variable (DecDummy) in this model help to nominate years of falling and rising activity.

Hence, the popular studies (e.g. Kama & Weiss, 2013; Ibrahim, 2018) follow the model of Anderson *et al*. (2003). To test for possible relationship between board characteristics and cost asymmetry, this study extends this model to include number of committees in board, average number of members in committee, overlapped member in committee (dummy variable) number of overlapped in committee, board compensation and other control variables like; economic growth and institutional ownership by taking product of each variable with DecDummyit × Log (Δ Salesit). Consequently, three-way interactions terms are created according to relevant studies (Anderson *et al*., 2003; Chen *et al*., 2012; Dierynck *et al*., 2012 and Ibrahim, 2018).

Variable and Operational Definition

Table 1: Variables and Operational Definition			
Variables	Operational Definition	Measurement	Source
Dependent Variables			
ΔTC_{it}	Change of Total Cost	"It is calculated as the $year_t$ TC divided by $year_{t-1}$ for the company I"	From Annual Report
Independent Variables			
$\Delta Sales_{it}$	Change of Sales	"It is calculated as the $year_t$ net sales divided by the net sales of $year_{t-1}$ for the firm I"	From Annual Report
$DecDummy_{it}$	Dummy Variable	"if the current year's sales less than the previous year's net sales then take dummy variable that equal to '1' and '0' otherwise"	Created on the basis of annual report data
$DecDummy_{it} \times \log(\Delta Sales_{it})$	Interaction-Term	"A two-way interaction term resulting from the multiplication of the dummy variable by the natural logarithm of change in net sales for the $year_{it}$ for firm I"	Created on the basis of annual report data
Board Committee's Structure			
Overlapped Members of Committees	Dummy Variable	"A dummy variable that equal to '1' if at least one member is common in the compensation committee and audit committee and '0' otherwise"	Created on the basis of annual report data
Number of Committees in Corporate Governance	Number of Committees in Board	"Number of Committees in Board"	Created on the basis of annual report data
Average number of members in committees	Average number of members in Committees	"Average number of members in Committees"	Created on the basis of annual report data
Number of overlapped members in Committees	Average number of overlapped members	Average number of overlapped members	Created on the basis of annual report data
Board Compensation	All incentive of CEO, Executive & Non-Executive Directors	"Sum of all compensation of board of directors"	From Annual Report
Control Variables			
Economic Growth	Real GDP	"Percentage of real gross domestic product growth in $year_t$, used as proxy for economic growth. Taken from World Bank website"	World Bank
Institutional Ownership	Ownership of Institutional	"The number of shares owned by institutional investors is divided by	From Annual Reports

Empirical Model

The objective of the study is to check the asymmetric cost behavior of Pakistani firms and find out the relationship between board committee's characteristics (NCB, ANMC, OMC, NOMC and BC) and cost behavior (TC). This study develop the following equation with including three-way interaction-term only (Anderson *et al.,* 2003; Kam & Weiss, 2013) and develop other equation with three-way interaction terms added standalone variables (Dierynck *et al.,* 2012; Ibrahim *et al.,* 2018).

All of the above, this study develop equation on basis of control variables and without control variables.

Model 01

$$\Delta TC_{it} = \beta 0 + \beta 1 Log\ (\Delta Sales_{it}) + \beta 2 DecDummy_{it} \times Log\ (\Delta Sales_{it}) + \Sigma \quad 3.1$$

Model 2: (No controls)

$$\Delta TC_{it} = \beta 0 + \beta 1 Log\ (\Delta Sales_{it}) + \beta 2 DecDummy_{it} \times Log\ (\Delta Sales_{it}) + \beta 3 DecDummyit \times Log\ (\Delta Sales_{it}) \times NCB_{it} + \beta 4 DecDummy_{it} \times Log\ (\Delta Sales_{it}) \times ANMC_{it} + \beta 5 DecDummyit \times Log\ (\Delta Sales_{it}) \times OMC_{it} + \beta 6 DecDummyit \times Log\ (\Delta Sales_{it}) \times NOMC_{it} + \beta 7 DecDummyit \times Log\ (\Delta Sales_{it}) \times BC_{it} + \beta 8 NCB_{it} + \beta 9 ANMC_{it} + \beta 10 OMC_{it} + \beta 11 NOMC_{it} + \beta 12 BC_{it} + \Sigma \quad 3.2$$

Model 3: (control variables)

$$\Delta TC_{it} = \beta 0 + \beta 1 Log\ (\Delta Sales_{it}) + \beta 2 DecDummy_{it} \times Log\ (\Delta Sales_{it}) + \beta 3 DecDummyit \times Log\ (\Delta Sales_{it}) \times NCB_{it} + \beta 4 DecDummy_{it} \times Log\ (\Delta Sales_{it}) \times ANMC_{it} + \beta 5 DecDummyit \times Log\ (\Delta Sales_{it}) \times OMC_{it} + \beta 6 DecDummyit \times Log\ (\Delta Sales_{it}) \times NOMC_{it} + \beta 7 DecDummyit \times Log\ (\Delta Sales_{it}) \times BC_{it} + \beta 8 DecDummyit \times Log\ (\Delta Sales_{it}) \times EG_{it} + \beta 9 DecDummyit \times Log\ (\Delta Sales_{it}) \times IOS_{it} + \beta 10 NCB_{it} + \beta 11 ANMC_{it} + \beta 12 OMC_{it} + \beta 13 NOMC_{it} + \beta 14 BC_{it} + \beta 15 BC_{it} + \beta 16 BC_{it} + \Sigma \quad 3.3$$

Data Analysis

RESULTS AND DISCUSSION

Table 2 presents descriptive statistics about annual sales, TC for the complete 5-year samples. TC average is 3.00 million Pakistani Rupees. It is lower than TC average of 1,577 million in Egyptian pounds and exchange rates is also took into consideration (Ibrahim, 2018). The average value of TC as a percentage of sales is 41.45% which is also less than the average value of TC, which is 67.57% as reported by Ibrahim (2018). The sample average net sales is 20 million Pakistani rupees with a standard deviation of 33 million, which is below the average net sales of $ 5,383 million of USA based sample (Chen *et al*., 2012). Moreover, The sample average net sales is also less than average net sales, which are $ 1,277, $ 1,153, $ 1,294 and $ 2,416 million reported by Anderson *et al*. (2003), Calleja *et al*. (2006), Subramaniam & Weidenmier (2003) and Ibrahim (2018) correspondingly.

The average net sales is 20 million in Pakistani Rupees along with a standard deviation of 33 million of this study sample. A study in USA, reported by Chen *et al.* (2012) that the average net sales of $5,383 million of study sample is greater than this study sample and also less than the average net sales of $1,277, $1,153, $1,294 and 2,416 million of samples tested by Anderson *et al*. (2003), Calleja *et al*. (2006), Subramaniam & Weidenmier (2003) and Ibrahim (2018) respectively.

The mode of NCB is 2.It means that majority of the firms have two major board committees (Remuneration and Audit) as reported by Madhani (2015). ANMC mode is 3. It represents that size of the committees is three which is supporting the finding of Upadhyay *et al*. (2014). There are 3 to 7 members in committees in firms listed in Pakistan Stock Exchange.

About 91% of the observation from sample is consisted on overlapping membership in audit and remuneration committee. It means that at least one member in audit committee is also present in remuneration committee. Whereas, there are average 2 overlapped member in both committees (audit and remuneration). Maximum overlapped members in committees is 5.The average value of economic growth is 5.12%, it indicates that the average

economic growth remans 5.12% from 2014 to 2018. Lastly, institutional ownership has 6.44% average value, which indicates that on average 6.44% of the properties of the sample companies are owned by institutional investors.

Table 2: Descriptive Statistics

Construct	Variables	Mean	Mode	Maximum	Minimum	Std. Dev.
Asymmetric Cost Behavior	TC	3,004,397		72,142,514	2,419	7,199,895
	TC%	41.45		4992	1.01	301.03
	Sales	20,800,765		233,607,420	599	33,050,880
Board Committee's Characteristics	NCB		2	6	1	
	ANMC		3	7	3	
	OMC		1			
	NOMC		2	5	0	
Board Compensation	BC	385,589.2		5,883,220	0	716,107.8
Control Variables	EG	5.213		5.701	4.675	0.476
	IOS	6.438		618.834	0.137	42.178

ΔTC_{it}=Change in Total Cost, NCD=Number of Committees in Board, ANMC=Average Number of Members in Committee, OMC=Overlapped Members in Committee, NOMC=Number of Overlapped Members in Committee, BC=Board Compensation, EG=Economic Growth, IOS=Institutional Ownership.

The study demonstrates the cost stickiness and relationship of board committee's characteristics and board compensation with asymmetric cost behavior of a firm. Asymmetric cost behavior is also observed because of control variables (Economic growth and Institutional growth are observed.

Table 3 provides the Pearson correlation between independent variables. Sales has insignificant relationship with all board committee's variables and control variable. However, the results reflect positive correlations between board committee's variables. NCB has positive associations with ANMC (0.249***), OMC (0.129***), NOMC (0.139***), BC (0.339***) significantly and no relationship found with EG. But, NCB has negative insignificant relationship with IOS (-0.013). ANMC has positive correlation with OMC (0.111**), NOMC (0.452***) and BC (0.174***) significantly and no relationship found with EG. But, It has negative insignificant relationship with IOS (-0.049). OMC has positive and significant relations with NOMC (0.517***) and BC (0.112**) and no relationship found with EG. But, OMC has negative insignificant relationship with IOS (-0.01). NOMC has an

insignificant positive relation with BC (0.068**) and insignificant relationship found with EG (0.677) and it has negative insignificant relationship with IOS (-0.065). BC has insignificant negative relationship with EG and IOS. Moreover, EG has no relationship with IOS. These results reflect that the increase in number of committees in board and committee size are related to an increase in chances of overlapped members in committee. Moreover, more the number of board committees in corporate board and committee size are resulted to more board compensation.

Table 3: Correlation

Variables	ΔTC_{it}	$\Delta Sales_{it}$	NCB	ANMC	OMC	NOMC	BC	SD	EG	IOS
ΔTC_{it}	1.000									

$\Delta Sales_{it}$	0.010	1.000								
	0.844	---								
NCB	-0.085	-0.015	1.000							
	0.079	0.756	---							
ANMC	-0.005	-0.030	0.249	1.000						
	0.998	0.529	0.000	---						
OMC	0.007	0.013	0.129	0.111	1.000					
	0.882	0.788	0.007	0.020	---					
NOMC	-0.008	0.014	0.139	0.452	0.517	1.000				
	0.866	0.775	0.000	0.000	0.000	---				
BC	-0.028	-0.026	0.339	0.174	0.112	0.068	1.000			
	0.558	0.597	0.000	0.000	0.020	0.159	---			
SD	0.141	0.039	0.026	0.118	0.042	-0.001	0.091	1.000		
	0.000	0.425	0.591	0.010	0.390	0.979	0.059	---		
EG	0.798	0.074	0.000	0.000	0.000	0.677	-0.627	0.632	1.000	
	0.105	0.154	0.000	0.000	0.000	0.209	0.257	0.253	---	
IOS	-0.013	0.011	-0.029	-0.049	-0.001	-0.065	-0.021	0.033	0.000	1.000
	0.785	0.814	0.537	0.300	0.983	0.181	0.657	0.496	0.000	---

ΔTC_{it}=Change in Total Cost, NCD=Number of Committees in Board, ANMC=Average Number of Members in Committee, OMC=Overlapped Members in Committee, NOMC=Number of Overlapped Members in Committee, BC=Board Compensation, EG=Economic Growth, IOS=Institutional Ownership.

Table 3 shows the value of Pearson correlation between the independent variables and the dependent variable. TC has positive relationship with Sales, OMC and EG, negative relationship with NCB, ANMC, NOMC, BC and IOS but relationship remains insignificant except NCB (-0.085***). These variables have high values, represent the lower the quality of the board

committee. Consequently, the costs show more asymmetric behavior. This correlation indicates, there is inverse relationship between quality of the committee and asymmetric costs. It means that stronger the board committees, lower the asymmetric cost behavior and lower the quality of board committees, the higher the degree of asymmetric behavior.

Generally, the high correlation among independent variables may mislead the results obtained from regression model. It is because of the multicollinearity among independent variables in the regression model and multicollinearity between two variables or more variables effect on estimated results. Even if there is no high correlation among the independent variables, there is still a certain degree of multidimensionality among the independent variables (Kanagaretnam *et al*., 2007).

Therefore, in order to know that there is no collinearity among the independent variables, variance inflation factor (VIF) of each independent variable is calculated. VIF values should not be greater than 10. After that, estimating the relationship between the independent variable and the dependent variable may be correct.

Regression Assumptions

Certain assumptions must be accepted to draw conclusions based on regression analysis. These assumptions should be checked before running the regression model. It is assumed that the independence of all dependent variable values is taken over by separate business entities (Berry, 1993).

Table 4 shows the results of normality test. To check the normality of data that if the probability value of Jarqua-Bera test is less than 0.05 than accepts data is not following normal distribution. Table 4 shows that, probability value of Jarqua- Bera test rejects that data is following normally distribution. Kurtosis and skewness values also reject the null hypothesis (H_0). Kurtosis values are greater than 3.00 and skewness value is also not coming in the range -0.8 to 0.8 (Jondeau & Rockinger, 2003). Non normal distribution of data can be transformed into normal distribution after taking log. It means, the presence of extreme or outliers values has been removed. Deletion of such extreme value may results in inefficient or misleading conclusions (Cook & Weisberg, 1982).

Furthermore, the normal residual probability graph confirms that there is no serious violation of the normal assumptions.

Correlation among the independent variables is a big problem. It can be checked through seeing the correlation matrix among independent variables. So, values remained between -0.0294 to 0.447. Tabachnick and Fidell (1996) explained that the bivariate correlation between the independent variables of 0.90 or more, indicates multicollinearity. In addition, multicollinearity through Variance Inflation Factor can also be examined.

Table 4: Tests of Normality

Construct	Variables	Skewness	Kurtosis	Jarque Bera	Prob Value
Asymmetric Cost Behavior	ΔTC_{it}	-0.34	2.51	12.57	0.00
	$\Delta Sales_{it}$	4.93	99.90	169989.5	0.00
Board Committee's Characteristics	NCB	1.43	8.47	683.92	0.00
	ANMC	1.25	3.82	124.52	0.00
	OMC	-2.95	9.72	1432.70	0.00
	NOMC	0.26	1.97	23.90	0.00
Board Compensation	BC	-1.76	11.25	1439.73	0.00
Control Variables	EG	-0.30	1.25	61.73	0.00
	IOS	0.93	6.23	248.08	0.00

ΔTC_{it}=Change in Total Cost, NCD=Number of Committees in Board, ANMC=Average Number of Members in Committee, OMC=Overlapped Members in Committee, NOMC=Number of Overlapped Members in Committee, BC=Board Compensation, EG=Economic Growth, IOS=Institutional Ownership,

Variance Inflation Factor (VIF) technique is used to see the multicollinearity among independent variables. VIF values ranged from 1.01 to 1.77. It means that there no multicollinearity among independent variables because these values are less than threshold value 9.00 in all cases. Furthermore, it also indicate that none of the independent variables can be explained by other independent variables. As noted by Myer (1990), values less than 10 do not pose a risk of multicollinearity.

The white hetroscedasticity test (non-cross products) was used. The LM statistic (Breusch-Pagan / Cook-Weisberg test for heteroscedasticity) remained below than its critical value in almost all cases. It indicates that the deviation of independent variable at each level is homogeneous. Accordingly, there is no evidence of heteroscedasticity. In this way, we can rely on the regression

results and do not need to find the generalized/ weighted least squares for further analysis.

Multiple Regression Analyses

This research used to test the asymmetric behavior of total cost of Pakistani firms. Moreover, board committee's characteristics is also included to see the cost behavior.

Unit Root Test

The purpose of unit root test is to determine whether the entire variable having stationary value or non-stationary values. Stationary data means that average, variance and covariance or autocorrelation remain same all the time. To check the data is stationary or non-stationary, first we saw the intercept and trends of values. Graphs depict that there is existence of intercept but not showing any trends. Now unit root test is applying on all dependent and independent variables at individual intercept. The Table 5 shows that (panel unit root test) only one variables TC are stationary at level. While, Independent variables (NCB, ANMC, OMC, NOMC and BC) and control variables (EG and IOS) are stationary at 1st difference.

Co-integration Test

The purpose of co-integration test is to check that all variables are in same order or not and having long run association. Before running the panel co-integration it should be assured that variables are non-stationary at level and become stationary at 1st difference. The Table 5 shows that same conditions. Co-integration test states that the Hº of no co-integration is rejected. Because t-statistics -15.05 at significance level 0.00 is given by Kao Residual Co-integration Test. Hence, it is concluded that all variables have long run association with each other and co-integrated in same order.

Table 5: Unit Root Test

Variables	Levin, Lin & Chu t*		ADF - Fisher Chi-square		PP - Fisher Chi-square		Unit at
	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.	
ΔTC_{it}	-10.35	0.00	361.34	0.00	358.48	0.00	Level
$\Delta Sales_{it}$	-32.59	0.00	634.87	0.00	631.71	0.03	1st Difference
NCB	-3.67	0.00	3.94	0.14	5.53	0.06	1st Difference

ANMC	-17.3	0.00	69.87	0.00	84.32	0.00	1st Difference
OMC	-1.77	0.00	3.44	0.75	4.94	0.00	1st Difference
NOMC	-14.65	0.00	66.62	0.00	82.45	0.00	1st Difference
BC	-38.81	0.00	452.34	0.00	473.84	0.00	1st Difference
EG	-1.99	0.02	91.27	1.00	91.27	1.00	1st Difference
IOS	-8.09	0.00	77.66	0.00	77.07	0.00	1st Difference

The Table 6 shows the estimated values of necessary statistics of the model. Huasman test accepts the H^o. It means panel data Radom effects model is appropriated because the guideline for Huasman test is that, if statistical value of test is not significant (p-value>0.05) then H^o is accepted and H^1 is rejected. The intercept term β^o is negative and insignificant in this model. The coefficient β^o represent the fixed cost which does not change with change of activity within certain limit. Here β^o is -0.04 at no significant level. Most of the cases, it has no economic meaning. It has only mechanical interpretation. It represents the average effect of all those variables which are not included in this model. Remaining coefficients are considered as partial slope coefficient. These partial slope coefficients represent the variation in dependent variables because of one percent change in explanatory variables while other variables hold constant. Here β^o shows the fixed cost. If production is zero than cost will be -0.04 rupees. So, it has no sense. Thus the coefficient B1 0.12 is attached with $Sales_{it}$ means that if Sales is increased by one rupee, other variable held constant, and the TC_{it} increase by Rs. 0.12. The relationship is being positive and significant. The estimated value of β2 is 0.55, which is significant at 0.01 level. It supports cost anti-stickiness. The combined value of β1 and β2 (0.12+0.55) is 0.67 which shows that TC_{it} decrease by about rupees 0.67 for a One rupees decrease in sales. The coefficients β1 and β2 are significant at 0.1 and 0.01 level respectively. Since the increase in TC anti-stickiness, it is because of manager intervention in the resource adjustment process. It means that TC is showed decline more than revenue fall than rise when sales revenues rise by an equivalent amount. It is a kind of management of real income which is expected to increase after the implementation of strategy. After implementing CG, managers deal with real earnings rather than revenue management accounting (Cohen *et al*., 2008). Moreover, managers becomes

more pessimistic when they realize that sales is about to fall, resulting to anti-stickiness behavior (Banker *et al.,* 2013, 2014). To conclude, the finding shows that cost behave asymmetrically. Furthermore, that F-Statistics = 16.58 (0.00) and $R^2 = 0.09$ shows that model is statistically significant and explain 9% variations.

The Table 7 shows the estimated values of necessary statistics of the model. Huasman test accept the H^o. It means panel data random effects model is

appropriated because the guideline for Huasman test is that, if statistical value of test is insignificant (p-value>0.05) then H^o is accepted and H^1 is rejected.

Table 6: Panel Least Square of Model Asymmetric TC Behavior

Variable	Coefficient	t-Statistic	Prob.	ΔTC_{it}
C	-0.04	-0.31	0.76	
$Sales_{it}$	0.12	1.79	0.07	
$DeDummy_{it} \times Log(\Delta Sales_{it})$	0.55	4.07	0.00	
R-squared				0.09
Wald Chi2 (2)				33.09
Prob > Chi2				0.00
Hausman Test (chi-sq. statistics)				8.86
Prob (Hausman Test)				0.12
ΔTC_{it}=Change in Total Cost, $DeDummy_{it} \times Log(\Delta Sales_{it})$=Interaction Term				

The intercept term β^o is negative in column (01), column (02), column (03) and column (04) and insignificant except column (01) in this model. The coefficient β^o (-0.02, -0.02*, -0.01 and -0.19) represent the fixed cost which does not change with change of activity within certain limit. Most of the cases, it has no economic meaning. It has only mechanical interpretation. It represents the average effect of all those variables which are not included in this model. Remaining coefficients are considered as partial slope coefficient. These partial slope coefficients represent the variation in dependent variables because of one percent change in explanatory variables while other variables hold constant.

Column (1) of Table 7 indicates that β1 is positive and it is statistically insignificant. Same as, β2 is also positive and statistically insignificant. Likewise, the coefficient β1 and coefficient β2 are positive and remains

statistically insignificant for the four cases. It shows that there is not asymmetric cost behavior. The possible reason is that, managers becomes more pessimistic when they realize that sales is about to fall (Banker *et al.,* 2013, 2014). Moreover, after adding standalones and control variables, the cost also shows insignificant relationship behavior because columns (02, 03, and 04) show that β1 and β2 remains positive and statistically insignificant. The findings of the four columns shows that there are insignificant relationship with the empirical hypothesis of cost asymmetric behavior, demonstrating that, as seen in Table 6, TC does not function asymmetrically as observed while testing the simple model.

Many committees show lesser cost stickiness. More committees in board will show higher standard of corporate governance. But, here number of committees in board show insignificant relationship with total cost behavior before & after control variable. These committees are designed to protect the interests of shareholders and supervise the board of directors which may conflict in interest between the committees. Additionally, managers becomes more pessimistic when they realize that sales is about to fall, resulting to anti-stickiness behavior (Banker *et al.,* 2013, 2014). Moreover, our results shows that strong CG reduces the cost stickiness (Chen *et al*., 2012). In addition, board committees can report to managers to modify resources in any way, regardless of their impact on cost behavior, as activity changes.

For ANMC, the findings demonstrate that, whether with standalone and control variables or even without, β4 coefficients are negative and statistically negligible. ANMC findings are more likely to encounter less stickiness in cost. This outcome is not compliant with my claim. The ultimate outcome further shows Chen *et al.* (2012)'s claim that broader board committee representatives will effectively increase the efficiency of governance. Additionally, Argument of Jensen (1993) is also established that huge boards face more trouble because they are not able to coordinate between their boards members effectively and Goodstein *et al*. (1994) proved that the bigger the board member lesser their participation in strategic decisions of the company. The probable justification, which emphasis that small boards effectively observe

decision of adjustment of resources, because they face minimum disputes and with high level of agreement with board members other than large boards.

For OMC, the findings reveal that β5 coefficients, either with or without standalone and control variables, are negative and statistically insignificant. Audit committee members can critically evaluate accounting discretion and they can used improved information from a common member sitting in a compensation committee to monitor the management decision. Previous studies have proved that enforcement compensation structures can lead to higher returns (Bartov & Mohanram, 2004; Cheng & Warfield, 2005) or to reduction in income (Baker *et al.,* 2003; McAnally *et al.,* 2008). Overlapped members can expect a potential increase in revenue or a decrease in revenue over the financial year based on knowledge of the opportunistic behavior of compensation in revenue management. For example, if an audit committee member knows that stock options will be available during this fiscal year and will likely be available in a future year, they may want to avoid management accounting judgments that carry current year's earnings into future earnings. Such attentiveness over transferred compensation information can cause it to challenge management accounting decisions, use of estimates, changes in accounting policies, and decisions to write derivative assets and other profit management mechanisms.

When an audit committee member is also a member of the compensation committee, that member can use knowledge of management-driven incentives to outline the opportunistic accounting decisions made by the management (Laux & Laux, 2009). Therefore, overlapping members of the Audit Committee with members of the Compensation Committee can help to reduce asymmetric information between the audit committee and management. Consequently, it will be resulting in better financial reporting due to increased oversight by the audit committee.

NOMC show greater cost stickiness. But, here number of overlapped members in audit and remuneration committee show insignificant relationship with cost asymmetric behavior whether, with control variables or without. The possible reason is that, there are costs associated with overlapping levels. A potential benefit of delegating roles to committees is that using smaller subgroups can

reduce problems while larger groups plague (Laux & Laux, 2009). If there is complete overlap of members in different committees then the committee's structure and its role break down. In addition, research shows that the committees' on-board structure has the advantage of being reduced if they overlap too much (Laux & Laux, 2009). This shows that the benefits of overlapping membership decrease after a certain point. Additional overlap after this point appears to have a detrimental effect because the costs of the overlap outweigh the benefits (Chandar *et al*., 2012).

For BC, the findings shows that the coefficients for the four cases are negative and these are statistically insignificant. This finding suggests that cost stickiness does not demonstrate a correlation with board compensation, which undermines the assumption of the research. Sometimes, managers cuts the resources in order to achieve earning targets when sales fall. They do so to get incentives. Therefore, incentives influence the manager's deliberated decisions. Ultimately, it effects on asymmetric cost behavior. The results shows that manager's deliberated decisions effect in creating an asymmetry of the firm's cost structure. Preliminary studies proved that how management decisions help to increase firm value and lead to cost stickiness (Anderson *et al*., 2003; Balakrishnan *et al*., 2004; Balakrishnan & Gruca, 2008 and Banker *et al.*, 2011). Chen *et al*. (2012) suggest that agency-driven incentives introduce greater cost stickiness.

Before and after standalone variables, there is a statistically insignificant association demonstrated by the economic growth coefficient. There are high periods of economic prosperity right the way around. During the economic growth time, executives are confident because they believe that reduction in sales is momentary, therefore managers are hesitant to retire slack resources even after the reduction of sale, which shows increase in cost stickiness behavior (Anderson *et al*., 2003; Ibrahim, 2015). On the other hand, this argument is incompatible with the regression result and the result showed negative relationship suggested by Anderson *et al.* (2003), Banker *et al.* (2013) and Ibrahim (2015) and Dierynck et al. (2012) proposed that the relationship is statistically insignificant.

Table 7: Panel Least Square of Model CG & Asymmetric TC Behavior				
Variable Statistics	**No Standalone**		**Standalone**	
	Before Controls 01	**After Controls 02**	**Before Controls 03**	**After Controls 04**
β°: Intercept	-0.02 (-1.60)	-0.02* (-1.86)	-0.01 (-0.12)	-0.19 (-0.72)
β1: $Sales_{it}$	0.09 (1.30)	0.07 (1.11)	0.09 (1.30)	0.07 (1.00)
β2: $DeDummy_{it}\times Log(\Delta Sales_{it})$	0.37 (0.55)	0.31 (0.13)	0.22 (0.24)	2.17 (0.70)
Three-Way Interaction Terms ($Variables\times DeDummy_{it}\times Log(\Delta Sales_{it})$				
β3: $NCB\times DeDummy_{it}\times Log(\Delta Sales_{it})$	-3.25*** (-2.92)	-2.50** (-2.16)	-2.25 (-1.54)	-0.66 (-0.42)
β4: $ANMC\times DeDummy_{it}\times Log(\Delta Sales_{it})$	-0.74 (-0.56)	-0.95 (-0.72)	-0.51 (-0.27)	-0.55 (-0.29)
β5: $OMC\times DeDummy_{it}\times Log(\Delta Sales_{it})$	0.53 (1.59)	0.48 (1.39)	0.57 (1.36)	0.58 (1.31)
β6: $NOMC\times DeDummy_{it}\times Log(\Delta Sales_{it})$	-0.72 (-1.18)	-0.86 (-1.40)	-1.12 (-1.38)	-1.44* (-1.77)
β7: $BC\times DeDummy_{it}\times Log(\Delta Sales_{it})$	0.33*** (3.44)	0.21* (1.82)	0.28*** (2.36)	0.03 (0.18)
β8: $EG\times DeDummy_{it}\times Log(\Delta Sales_{it})$		1.30 (0.43)		-0.98 (-0.25)
β9: $IOS\times DeDummy_{it}\times Log(\Delta Sales_{it})$		-0.66*** (-2.50)		-0.95*** (-2.75)
Standalone Variables (Variables without Interaction)				
β10: NCB			-0.14 (-1.03)	-0.21 (-1.47)
β11: ANMC			-0.02 (-0.13)	-0.05 (-0.26)
β12: OMC			-0.01 (-0.15)	-0.01 (-0.19)
β13: NOMC			0.05 (0.67)	0.07 (0.90)
β14: BC			0.01 (0.61)	0.02 (1.31)
β15: EG				0.19 (0.56)
β16: IOS				0.02 (0.79)
Wald Chi2	51.66 (0.00)	59.23 (0.00)	52.78 (0.00)	63.07 (0.00)
R-Square	0.09	0.10	0.10	0.10
Hausman Test (chi-sq. statistics)	986.05 (0.12)			

Finally, a negative and statistically insignificant correlation is displayed by coefficient of institutional ownership. It also correlate with the monitoring hypotheses and agency theory which explains that institutional investors are well experienced in analytical skills, grasp more experience and control than others. It also facilitate these investor to observe and influence the decision making of managers (Jensen & Meckling, 1976; Abdel-Fattah, 2008). Another study found reliable results that also confirmed that effective governance mechanism can be used as the tool of institutional ownership that can be used to alleviate the control of agency problems on stickiness of TC (Chen *et al.*, 2012).

Overall, TC is not showing asymmetric behavior while having NCB, ANMC, OMC, NOMC and BC. Either before or after the standalone and control variables were introduced, it was not observed to improve price stickiness. Economic growth and institutional ownership are also not found to raise or decrease the stickiness of costs in this regard.

Conclusion

This study confirmed that TC_{it} behave anti-sticky. Sales is increased by one rupee, the TC_{it} increase by Rs. 0.12 and TC_{it} decreases by about rupees 0.67 for a one rupees decrease in sales. This result confirmed the Hypothesis 1. It shows that total cost behave asymmetrically. TC is not showing asymmetric behavior while having NCB, ANMC, OMC, NOMC and BC, It did not find to increase/decrease cost stickiness. TC remains insignificant while introducing the standalone and control variables. About this, Further, EG and IOS are not found helpful to increase/decrease cost stickiness

This study also contribute in existing literature by examining whether costs in the Pakistani business environment are shown asymmetrical behavior. First, it examines whether the cost-effectiveness behavior is dependent on changes in the sales of the most actively traded Pakistani's companies listed in 2014 to 2018. The results show that all investigated costs (TC) behave asymmetric. It means that they increase/decrease more than they decrease/increase when the demand changes by an appropriate amount. This research extends the cost literature by presenting new information from developing markets and

analyzing the influence of characteristic of board committees. It shows that number of committees in board, average numbers of members in committees, overlapped member in committees, number of overlapped member in committees and board compensation have not been found to influence cost behavior change.

Moreover, this study examines and compares the asymmetric behavior of cost before and after implementation of control variables. The reason for this comparison is to show that how board committee's characteristics (e.g. NCB, ANMC, OMC, NOMC and BC) effect on total cost behavior while in economic growth and institutional ownership. The analysis results show that the nature of TC is not showing sticky behavior before and after implementing control variables. The assumption that corporate governance mechanisms are effective. It can influence managers' decisions as well as cost behavior. The general assumption is that lack of costs is the dominant cost behavior in developing and developed countries, and that central government can influence managers' decisions to adjust resources when activities are changed.

The results of the study have several implications. This research is useful for researchers as well as for practitioners in Pakistan. Firstly, this study examine the sticky behavior of Pakistani firms. It will also contribute in literature for researchers of developing economies like Pakistan. Apart from that, this research is one of those studies that combine the perspective of management and financial accounting. It encourage researchers to apply this multidisciplinary approach in exploring numerous exploration topics. Secondly, it is more useful when practitioner is to take consideration of fixed costs where he estimates the change in volume of variable cost corresponding to activity changes. It also help to avoid underestimating or overestimating the responsiveness of costs to rises or declines in production. It can help Security Exchange Commission of Pakistan (SECP) as well as production management to make accurate decisions based on accurate cost analysis. For CG regulators, they need to consider how deliberate management interventions can lead to asymmetric behavior in costs and how CG can mitigate such interventions. You should consider smaller committee size, only one overlap members and institutional ownership as variables that can reduce under-costs. For investors

and analysts, they need to consider asymmetric cost behavior when making sales forecasts.

One limitation is that this study has small sample as compared to related studies. Additionally, only five board committees' characteristics were examined in this study, although several other characteristics still need to be investigated. The main limitation of this study is that when the results may be due to other circumstances other than the CG application, the comparative method is used to examine the impact of CG on cost behavior. Moreover, the CG variables were not examined in this study except board committee's characteristics. However, during the investigation, we did not find any data on the level of regulatory compliance in Pakistani's emerging markets.

Future research may consider the deployment of inherent cost rather than variable cost. CG is predictable to impact the cost behavior of Pakistani companies. In addition, it is valuable to find out the effects of cost reduction behavior. Either sticky behavior affect the corporate value of listed companies in Pakistan or not. Furthermore, in the field of cost accounting, studying the cost implications of standard costing tools can add value to current research.

There is no connection between the processes of total cost actions and board committees. Thus, it is important to analyze other CG structures, such as the features of the audit committee, its categories of auditors, and different variable ownership arrangements. Finally, potential studies may propose an approach in which much of the previous research is included in this study either to suggest asymmetric expense behavior. The correlation between cost behavior and other accounting issues can also be identified.

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