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**Board Characteristics Effect
on Cost Stickiness Using Earnings
Management as a Mediating
Variable “Evidence from Egypt”**

Abstract

Purpose: This research demonstrates the impact of board characteristics on the cost stickiness of companies in various Egyptian industries, and how the earnings management perspective will increase the cost stickiness through managerial decisions that are mainly directed to reflect a better estimate for their firm' performance and earnings by adjusting resources costs.

Design/methodology/approach: The ordinary least squares (OLS) used to investigate the behavior of selling, general and administrative cost, and the influence of board characteristics (corporate governance mechanisms: board size, board independence, and CEO duality) to reduce cost stickiness using earnings management as an intermediary variable and firm size and financial performance as control variables in a sample of 41 Egyptian active publicly traded companies. Data is obtained from the financial statements published between 2015–2019 and the multiple linear regression equations utilized to analyze the data; the board characteristics variables are identified from the section of governance in the annual reports.

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Findings: Findings indicate that corporate governance has a control ability over the board of directors, which in turn has an inverse effect on cost stickiness which tends to increase if management is willing to disclose optimistic earnings forecast about firm' future performance. The board independence, large board size, and the absence of CEO duality have a positive impact on the efficient monitoring and reduction of earnings management. The statistical results showed that effective corporate governance can reduce cost stickiness, as well as its strong effect on mitigating earnings management.

Research limitations/implications: The main limitation of the research is that it covers only five years of annual financial reports in testing the hypotheses. In addition, the authors used only four proxies for the board characteristics (corporate governance mechanisms: board size, board independence, and CEO duality).

Originality: The research's main contribution is to be among the few papers that test the cost stickiness in Egypt as an emerging economy concerning the board characteristics through taking into consideration the earnings management effect as a mediating variable.

Keywords: Board Characteristics; Cost Stickiness; Earnings Management; Egypt

تأثير خصائص مجلس الإدارة على التكاليف ذات السلوك غير المنتظم باستخدام إدارة الأرباح كمتغير وسيط - أدلة من البورصة المصرية

ملخص البحث

يبحث هذا البحث تأثير خصائص مجلس الإدارة على التكاليف ذات السلوك غير المنتظم صعودا في مختلف الصناعات المصرية، وكيف أن منظور إدارة الأرباح سيزيد من هذا السلوك من خلال القرارات الإدارية التي يتم توجيهها بشكل أساسي لتعكس تقييما أفضل لأداء شركاتهم والأرباح عن طريق تعديل تكاليف الموارد اللازمة.

تم استخدام طريقة الانحدار باستخدام المربعات الصغرى العادية (OLS) للتحقيق في سلوك البيع، والتكلفة العامة والإدارية، وتأثير خصائص مجلس الإدارة (آليات حوكمة الشركة: حجم المجلس، واستقلالية المجلس، وازدواجية الرئيس التنفيذي) لتقليل التكلفة الثابت باستخدام إدارة الأرباح كمتغير وسيط وحجم الشركة والأداء المالي كمتغيرات رقابية. تم اختيار عينة من ٤١ شركة مصرية نشطة مدرجة في البورصة. تم الحصول على البيانات من القوائم المالية المنشورة بين ٢٠١٥-٢٠١٩ ومعادلات الانحدار الخطي المتعددة المستخدمة لتحليل البيانات؛ تم تحديد متغيرات خصائص مجلس الإدارة من قسم الحوكمة في التقارير السنوية.

تشير نتائج البحث إلى أن حوكمة الشركات لديها القدرة على التحكم في مجلس الإدارة، وهذا بدوره له تأثير عكسي على التكاليف ذات السلوك غير المنتظم صعودا والذي يميل إلى الزيادة إذا كانت الإدارة على استعداد للإفصاح عن توقعات الأرباح المتقابلة بشأن الأداء المستقبلي للشركة. إن استقلالية مجلس الإدارة وحجم مجلس الإدارة الكبير وغياب ازدواجية الرئيس التنفيذي لها تأثير إيجابي على المراقبة الفعالة وتقليل إدارة الأرباح. أظهرت النتائج الإحصائية أن الحوكمة الفعالة للشركات يمكن أن تقلل من السلوك غير المنتظم صعودا للتكاليف، وكذلك تأثيرها على إدارة الأرباح.

تتمثل حدود البحث في أنه يغطي خمس سنوات فقط من التقارير المالية السنوية في اختبار الفرضيات. بالإضافة إلى ذلك، استخدم المؤلفون أربعة خصائص لمجلس الإدارة (آليات حوكمة الشركة: حجم المجلس، واستقلالية المجلس، وازدواجية الرئيس التنفيذي).

مساهمة البحث الرئيسية في أنه من بين الأوراق القليلة التي تختبر التكاليف ذات السلوك غير المنتظم صعودا في مصر كاقصاد ناشئ فيما يتعلق بخصائص مجلس الإدارة من خلال مراعاة تأثير إدارة الأرباح كمتغير وسيط.

الكلمات المفتاحية: خصائص مجلس الإدارة؛ السلوك غير المنتظم، إدارة الأرباح؛ مصر

1. Introduction

Cost's activity relationship has been explained traditionally as when selling activity rises (falls), while the cost also increases (decrease) by the same percent. However nowadays a phenomenon known as cost stickiness has been observed, that when selling activity increase, it results in a greater increase in costs than when selling activities decrease (Anderson et al. 2003). This means that costs increase more rapidly when activity rises than they decrease when activity falls. Cost stickiness is considered an asymmetric cost behavior in response to the change in activities; it is based on the managerial decisions and manager's intervention that affects resource adjustments when sales decreases, managers need to consider market fluctuation in past and future periods.

The main difference between the traditionally costs classifications and cost stickiness is that the former is classified into fixed, variable, and mixed cost based on the relationship between the amounts of change in the activity level and not based on the direction of this change as the latter do (Boraq 2016).

Cost anti-stickiness phenomenon is the opposite of cost stickiness and it is defined as costs increase slowly when sales revenue increases, while costs decrease more rapidly when sales revenue decreases.

The level of costs stickiness is influenced by whether the cost is fixed and variable cost and also by the decision made by the self-interested managers derived by their incentives, for example, the salary of permanent staff is a fixed cost component in the selling, general and administrative costs that will directly create sticky cost behavior (Anderson et al. 2003). Managers are agents who are hired by investors and in most cases, their managerial interests are different from the investors' interests. Thus, to chase their benefits, managers may keep the cost of unused costs which are beneficial for their reputation and compensation, and in contrast, more competitive industries, they may also meet profit targets, reduce unused resources to optimal levels to maximize profits. To make companies survive in fierce competition, managers have to restrict their self-interested incentives and benefits and to work to maximize shareholders' interest and wealth.

Corporate governance helps in reducing agency problems and enhances information symmetry. Corporate governance is a set of rules, laws, policies, and instructions that act as controlling and monitoring mechanisms that ensure that managers work for the shareholders' interest, not for their one only and ensure fairness and transparency in the relationship between them; it is a mediator between agency problems and the stickiness of costs, it includes structures and distribution of responsibilities and rewards and responsibilities conditions to reduce conflicting of interests and protect the rights of small shareholders.

When the sales revenue fall, a pessimistic manager toward the future demand will reduce the amount of cost incurred, while an optimistic manager usually would reduce the cost incurred but not with the same percentage of the decreased sales. The time needed by managers to decide about cost reduction would cause a delay that is one of the main factors that cause sticky cost phenomena (Sorros and Karagiorgos 2013).

In recent years, the importance of corporate governance has become critical due to the increased cases of bankruptcies due to errors or fraud in financial statements caused by the lack of corporate governance regulations in these companies; this resulted in earnings management through the implementation of cost adjustments that are not aligned with the optimal resource allocation (Yihuan 2018). The application of corporate governance is crucial to attract investors and build a trusted marketplace, as well as enhance investors' confidence by ensuring the existence of an independent board of directors (Guo and Kga 2012).

Earnings management is not an accounting fraud, because it is conducted within the boundary of the accounting principles, especially when the principles provide discretion in the accounting policies.

Healy and Wahlen (1999) showed that earning management occurs when managers modify a certain judgment, related to the structure of the financial reporting or in specific accounting transaction, to change the disclosed information to external users, about the financial performance of the company, or to influence contracts that depend on the disclosed results.

This research aims to examine the impact of corporate governance (board characteristics) on cost stickiness using earning management as a mediating variable in this relation. This research checks the interaction impact of corporate governance mechanisms and earnings management on cost stickiness to provide a better understanding of cost stickiness and assist current and potential investors true understanding changes in cost, to forecast accurately firms' cash flows and earnings. This research examines how CG mechanisms could influence asymmetric cost behavior. The researchers examine whether board characteristics as a corporate governance mechanism can control and monitor managers' decisions regarding cost adjustments when activity level changes.

Effective practice of corporate governance mechanisms is accompanying by some characteristics of the board of directors that can restrict conflict of interest and can contribute to monitor and improve the control of cost stickiness through reducing earnings management practices (Wan and Wang 2011).

Corporate governance is the set of rules, policies, and processes that manage and regulate a company. Corporate governance aims for balancing the interests of many interested parties, including shareholders, executives, clients, suppliers, financiers, government, and the community. The corporate governance mechanisms of a company are several such as the structure of capital, organizational strategy and structure, executive and auditing boards. Many businesses adopt Corporate Governance Principles and Guidelines to give the best practice for evaluating the suitability of the Corporate Governance System. The board of the director is the authority responsible for the definition of objectives, strategy, and monitoring of the management performance of the firm in line with its status according to the Egyptians' Code of Corporate Governance, (2016). With different qualities, the board can perform its directing, monitoring, and advising tasks. Size of the board, independence of the board, the duality of duty, and vigilance comprise these features (El-Deeb and Elsharkawy, 2019).

This research is structured as follows; section 2 provides a literature review and hypotheses development. the sticky cost behavior model and sheds light on the theoretical interaction between board characteristics and cost stickiness and

incentives for earnings management. Section 3 present research methodology and introduce the sample selected and used data. Section 4 reports the hypotheses testing and empirical findings and finally, section 5 provides a conclusion.

2. Literature Review and Hypotheses Development

Hemathilake et al. (2019) examined the relationship between board characteristics and earnings management as the former is a vital part of corporate governance mechanisms. The corporate governance variables used were board independence, CEO duality, financial expertise' board members, number of board size, and meetings. The control variables used were auditor type, firm size, and leverage. Results showed that board size and CEO duality are negatively correlated to earnings management while board size and independence, the financial experience of board members are positively correlated to the practices of earnings management.

Mohammad et al. (2018) examined the impact of corporate governance and earnings management on general and administrative, R&D, and advertising cost stickiness. Results show that effective practices of corporate governance limit cost stickiness more significantly than restricting earnings management.

Shipeng et al, (2018) found that the extent of expense stickiness is much related to favorable earnings news expected by management. Findings reveal that both managerial optimism and information asymmetry interpret the association between expense stickiness and earnings management forecasts.

Yihuan (2018) explained the impact of earnings management motivation on cost stickiness and how the former affects the firm's cost management behavior. Results reveal that the formation earnings mechanism helps investors make more reasonable pricing or valuation in the purchase of private equity placement, which in turn enhances the efficiency of capital markets.

Awad and Amr (2017) examined the phenomena of asymmetric cost behavior (cost stickiness) in Egypt. They analyze the behavior of cost of goods sold and selling, general, and administrative costs in light of applying Egypt in 2007 the code of corporate governance. Results show that asymmetric cost behavior is

widely exists among Egyptian-listed firms but the application of corporate governance affects the magnitude and behavior of costs by changing it from sticky to anti-sticky.

Mahsan (2017) examined the relationship between earnings management and selling, general and administrative (SG&A) costs stickiness. Findings indicate that when sales decline, firms manipulate earnings, as manipulating non-discretionary costs leads to an increase in the intensity of cost reduction. In contrast, Mahmoud (2017) found that management of increasing earnings had no significant impact on cost stickiness. Yusi (2017) showed how earnings management motivations have a significant impact on the corporate cost stickiness of enterprises. Results can assist managers in estimating the cost stickiness more accurately, this helps management to make correct decisions and enhance the improvement of enterprise performance.

Shuang and Yun (2016) investigated the effects of earnings management and corporate governance on cost stickiness. Taking two samples, they found significant expense stickiness in the non-earnings-management, compared with the earnings management. They found that mainly managers control costs by reducing general administrative expenses. Results show that effective corporate governance decreases expense stickiness, although its effect on earnings management is not so strong.

Xue and Hong (2016) found that earnings management in non-audited firms shows a higher level of expense stickiness, and that good corporate governance could reduce the extent of expense stickiness.

Awad Elsayed (2015) examined how economic growth affects the way the cost of goods sold and selling, general, and administrative, and operating costs behave in Egyptian companies. Results show that costs behave sticky during the prosperity periods and anti-sticky during the recession periods.

Iraya et al. (2015) investigated the impact of corporate governance practices on earnings management and results indicate a negative impact of board size, board independence, and ownership concentration on earnings management and

a positive impact of the board activity and CEO duality on earnings management.

Patrick et al., (2015) indicated that corporate governance mechanisms such as the board size, board independence, and the strength of the audit committee reduce earnings management practices.

Siam et al. (2014) examined how board characteristics (mainly board independence, board size, board meetings, CEO duality, and the existence of financial expertise) have an impact on earning management. Findings indicated that effective corporate governance constraints significantly earnings management.

Kama and Weiss (2013) investigated the factors underlying managers' resource adjustments like the incentives to meet earnings targets and to avoid losses or earnings decreases and to meet financial analysts' earnings forecasts, findings indicate that they expedite downward adjustment of slack resources for sales decreases and suggest that efforts should be forwarded toward understanding agency-driven incentives that underline resource adjustment decisions. The results indicate that the asymmetry in the behavior of costs is based usually on managerial adjustment that is guided by their incentives to manage the slack in resources to meet targets on reported profits.

Abed et al., (2012) showed that the board size, board independence, CEO duality, and the percentage of managerial ownership has a significant relation with earnings management.

Chen et al. (2012) indicate that companies have a higher level of cost stickiness and adjustments when manager's expectations about the future demand are positive, and when there is a low degree of resources utilizations in current periods. They find that SG&S is the stickiest cost and that cost stickiness is decrease with strong corporate governance mainly institutional ownership and board independence could reduce the impact of agency conflict on cost stickiness.

Nikumaram and Mohammadzadeh (2011) investigated the association between earnings management practices and the effective mechanisms of corporate

governance. Findings showed that companies with strong corporate governance have less discretionary accruals.

Chen et al. (2008) showed that companies with large size board of directors that are more independent and have a lower level of expense stickiness. Also, corporate governance mechanisms have a great impact in reducing cost stickiness.

Anderson et al. (2003) examined the cost stickiness asymmetric behavior. Findings indicate that SG&A costs decrease by a smaller percentage when the related sales decline but rise by a larger percentage when the sales increase. This cost behavior is motivated by perceptions of optimistic future demand by management. Therefore, as sales decline, the manager's trade-off between the costs of changing the resources allocated concerning the decrease in sales and the costs of retaining the number of existing resources with unused power. Xie et al. (2003) indicate that earnings management is less in companies with large size boards of directors as it assumes a higher level of management supervision and a great extent of corporate decisions, however, excessive size may cause coordination and communication problems.

2.1 Sticky Cost Behavior Model

Traditional cost accounting classifies cost as variable and fixed costs related to their change with the activity volume. Proportional adaptation of costs to sales changes can be used as an indicator for cost control quality of company 'management and its competitiveness in the marketplace (Dezie and Dewi 2014).

Anderson et al. (2003) define sticky costs as the costs decrement with the decrease in the volume of activity by a lower percentage than increment when the volume of activity increase, i.e. the extent of increase in costs with the sales volume increase is greater than the extent of decrease in costs with the same decrease in sales volume, which is in contrast to the traditional cost behavior. The cost stickiness phenomenon depends on the managerial decisions regarding resource adjustments. Managers and users of cost data need to understand cost be-

havior to make more accurate decisions regarding the prediction of future costs related to planning for production, marketing, and others.

When sales revenue falls, managers decide whether to keep the unused resources or to reduce them to optimal levels. Managers consider market fluctuations, macroeconomic factors, the performance of companies in past periods, and the likelihood of change in sales revenue.

Ghaemi and Nematollahi (2011) find that in real business SG&A costs increase by 0.55% for every 1% rise in sales and a decrease by only 0.35% when sales fall by 1. In turn, the cost increase caused by the increase of operating net income was higher than the cost decline caused by the decrease of operating net income (Yihuan 2018). SG&A costs are important operational costs, so managers tend to increase these costs rapidly and decrease them slowly in falling sale time and this cost behavior has a significant influence on profit (Hosein 2017).

This is because of the sticky cost behavior which rises more steeply while increasing sales revenue than declining while the decrease in sales revenue in the same proportion (Anderson et al. 2003).

The sticky cost model differs from the traditional costs; it permits managers and management accountants to adjust resources according to the changes in the volume of activity, not to respond proportionately and symmetrically to volume changes within the relevant range (Boraq 2016), therefore, cost stickiness is non-symmetrical behavior as in the real world, the costs trend is claimed to react to ascending and descending changes in the volume of activity differentially (Mohammad and Zeynab 2014).

It was found that managers' response to the same demand changes differently, and thus, the cost in turn response is different, which is in contradictions to the traditional cost model (Awad Elsayed 2018), even when managers face a decline in demand, they do not want to decrease input resources and related costs, which, in turn, lead to cost stickiness. Banker et al. (2011) revealed that in actual operation, managers usually expectations that sales will increase in the coming year. That's why the cost adjustment of reducing resource input when activities

fall is higher than that of increasing input under raising activity, which is inconsistent with the traditional model of cost behavior.

The reason for these sticky cost behaviors is that managers may trade-off between two types of costs: unadjusted costs when operating with unutilized resources and adjusted costs when retiring the unutilized resources, here they will be more likely to choose the decision that yields the lower costs. In other words, if managers are optimistic about the future sales level, they will decide to operate with slack resources and will not adjust the resources when the activity declines, and this will in turn will cause higher cost stickiness.

He et al. (2010) argue that when revenue decline, managers may be hesitant to decrease assets, number of employees, or other resources that generate costs. He explained that managers behavior is influence by two main reasons: first, is based on agency theory, which dictates that managers usually make decisions that maximize their own best interests at the expense of investors interests, and in turn, they choose to maintain slack resources to avoid any personal consequences; second, managers are not sure of future demands, thus they will delay the cutting of resources until it is clear that the fall in activity is permanently (Awad and Amr 2017). Anderson et al. (2007) viewed this as a positive business signal as investors and financial analysts may indicate that the sales level is expected to increase in the next period, which will results in higher financial performance for companies that have sticky costs behavior during fall in sales in the previous period. This higher financial performance caused by higher operating leverage and positive expectations held by managers led toward only a partial adjustment in the face of sales decline. Managers' point of view is that sales fluctuate up and down from period to period. Thus, the company should absorb adjustments costs to decrease and to increase committed fixed resources. Anderson et al. (2003) argued managers may tend to assume that the demand drop is for a short period and the sales level will increase as it is more likely to increase than decrease. Therefore, firms usually add committed resources than reducing them (Dezie and Dewi 2014).

The critical question of why managers retain unused resources when demand falls is explained by Anderson et al. (2003), the reason is managers do not adjust resources when they predict that the decrease in demand is temporary. Here, managers believe that the adjustment costs of reducing resources are greater than the costs of keeping these unused resources during the short period of demand decline, therefore, managers wait and downward resources only when they are sure that the demand decline is permanent, i.e. they trade-off between cost adjustment of unused resources and operating with the additional costs of unused resources. However, normally, managers expand the company committed resources when demand increases, which leads to sticky cost behavior.

Cost stickiness is an avoidable phenomenon that can be prevented by managers; it is a result of their decisions about resource cost adjustment. The following are the forces and drivers that result in restraining or slowing the downward cost adjustment process more than the upward cost adjustment process during the period.

- 1. Adjustment Costs:** cost stickiness occurs to slow or restrain the downward resource adjustment process more than the upward resource adjustment process. Managers make decisions whether to keep the slack costs or to decrease costs sufficiently. Managers usually consider the current and previous and forecast of the operation levels and sales revenue of the business. Thus, asymmetric information about costs exists due to the managerial interventions and they should consider whether the decrease in costs is critical or whether the costs should be kept at the same level for future operations. If they select to retain the slack resources, the cost will be sticky. It found that managers prefer usually to wait for a long time before they make decisions to obtain more information, this time gap between managers' decisions and actual changes in sales revenue, leads also to the phenomenon of cost stickiness.
- 2. Managers' Optimism:** When managers have optimistic expectations and judgments about the market and future demand conditions, they will maintain slack costs which will shift cost stickiness to a higher degree. In contrast, when market conditions indicate pessimistic signals, managers will reduce

slack costs immediately to manage earnings. Overconfident managers have great expectations that sales will increase shortly so they try to extend the sales demand and decide to keep SG&A costs away from the optimal level. Thus, managers' optimism on market conditions is an important driver of asymmetric cost.

- 3. Managers' Incentives:** The self-interested incentive of managers is one of the drivers of cost stickiness. Managers act as agents who are hired by shareholders but they have their considerations and benefits; they may have little incentives to optimize the operating efficiency of companies in case of conflict of interest. They may keep slack input resources which are beneficial for their repetition and compensation and, general and administrative costs are one of the accounts that include beneficial items for managers. Thus, managers could make decisions to these costs away from the optimal levels, which leads to the cost stickiness phenomenon. On contrary, when managers face incentives to avoid losses, meet earnings targets, or meet financial analysts' earnings forecasts, the degree of cost stickiness is reduced, so they expedite downward cost adjustment of unutilized resources for sales decreases.
- 4. Product Market Competition:** When managers need to meet earnings targets, they would reduce slack input costs to optimal levels. If the product market is competitive, costs reduction is common among companies because severe competition is associated with decreasing prices thus managers have more incentives to cut unutilized resources to maximize profits. To make companies survive in competitive markets, managers have to restrict their own-interested incentives. Product market competition may have to somehow the effect of corporate governance in reducing the agency problems and improves cost information symmetry of SG&A costs.
- 5. Operating Policy:** Companies may concern about losing highly qualified employees team staff; they know that it can be hard to find the same specialists when the demand is increasing again. As with human resources, when management expects a future raise in sales, they will maintain unutilized resources, because of the considerable adjustment costs, which include the costs for re-

turn, restore and rebuilding company-specific investments (Anderson et al. 2003). These restore costs may be significantly higher than the unused capacity costs in the time of lower sales. Holding unused capacity can be a basis for reacting quicker to future raising demand and also for sustaining real options.

2.2 Board Characteristics and Cost Stickiness

Corporate governance is used to identify the relationship between the company and its stakeholders; it is a set of internal monitoring practices, regulations, laws, processes that ensure that the outside investors are protected from the expropriation by the insider managers. Corporate governance minimizes the conflict of interest between managers and investors as it deals with the segregation between control and ownership.

Corporate governance mechanisms include the proportion of non-executive (independent) directors on the board, separation of the task of chairman and chief executive officer, and the size of the board itself.

Corporate governance targets to achieve the goals of accountability of the board of directors towards maximizing shareholder's wealth. The role of the board of directors here is to oversee and ensure that the company's executives act on behalf of shareholders in a way that shareholders' interests and prosperity are properly maintained.

However, usually, managers tend not to meet the optimal interests of shareholders and act opportunistically to meet their managerial interests, not the firm's interests. Managers can take advantage of the information they have in meeting their interests (information asymmetry). One form of information asymmetry is costs stickiness, which is a cost adjustment result of the purposeful decision taken by managers. The managers must forecast if a declining level of activity happens whether a decline in sales demand is temporary or not. Managers should make a purposeful decision considering retaining unnecessary capacity temporarily or eliminating unnecessary capacity (and incur the cost stickiness) and then if sales increase again reacquiring resources.

The asymmetric cost behavior of cost stickiness primarily from managers' deliberate and opportunistic decisions when sales demand changes, here, corporate governance can mitigate this managerial opportunism intervention, and in turn, bring the optimal cost response level as much as can (Awad Elsayed 2018). Here, managers incentives and motives let them do this in order not to hurt their status (Cooper & Kaplan 1998), the manager's behavior suggest when the demand of activity reduced, they likely remain he slack resources (i.e., do not reduce variable cost) than break a supply of resources contract which has been very costly for them to renegotiate the contracts. In this case, sales revenues and costs will not decrease proportionally.

Corporate governance mechanisms are viewed as a business culture that is employed to foster economic growth by building up the confidence of investors through reducing the agency cost that results from the conflict of interest between the board of directors and investors (Robert 2013) when there is a separation of ownership and control (Yuan, 2005). Good corporate governance supports goal congruence as managers will try to maximize the wealth of owners through reducing management opportunism behavior while protecting principals' interests (Uwuigbe et al. 2014).

Corporate governance includes legal, cultural, and institutional practices that guide corporate direction and performance. These practices related to the shareholders and their ownership structure, the board of directors and its combination, that the company management who affect the company movement (Mohammad and Zeynab 2014), thus the board of directors should be independent of the management to ensure the board independence properly (Chen et al. 2012).

Corporate governance and board characteristics play a mediator role in this conflict of interest between shareholders and managers.

- **Board size.** Board Size is measured as the total number of directors on the board. (Chen et al. 2012). It is expected that larger boards will include a pool of expertise directors and will have more resources and in turn are more able to control, monitor, and provide firms with diversity that could mitigate the

dominance of CEO, thus a large board is considered as an effective governance tool in solving agency problem, and expected to reduce the likelihood of the discretionary accruals and thus provide more reliable financial reporting to the investors due to the high inspection and monitoring degree exercised by the large board of directors.

- **Board independence.** This ratio is measured by dividing the number of outside directors by the total number of directors. More independent boards will be much aligned to the shareholders and with firm value and will reduce the engagement in earnings management and financial fraud; this is because the higher percentage of non-executive directors means more monitoring, unbiased and effective control.
- **Role duality.** It occurs when the board chairman and CEO are the same people. Agency problems and information asymmetry are higher and corporate governance practices require the separation of them to ensure board effectiveness.

Chen et al. (2012) investigated the impact of agency problems between managers and shareholders on cost stickiness and the results showed that cost stickiness plays a critical role in managers' incentives such as managerial compensations and tenure and that effective corporate governance practices can mitigate this condition.

Based on the previous illustrated literature, authors formed the first hypothesis:

H1: There is a significant association between Board characteristics and cost stickiness.

2.3 Board Characteristics and Earnings Management

Earnings management is incurred when managers decide to use discretion in transaction structure to alter the financial reporting in a way that can mislead stakeholders about the current financial performance of the company or influence contractual outcomes that are based on reported financial results or attract low-cost external financing. In this case, reported earnings become a less reliable

indicator for the performance of the company. The quality of financial information affects shareholders' estimates of future cash flows as earning management manipulates earnings in many ways as sales revenue manipulation, overproduction, and decreasing discretionary costs (Mahsan 2017).

Cost stickiness occurs when managers decide to retain unused resources rather than make cost adjustment costs they are more unwilling to decrease total operational costs because a probability that sales demand declines is temporarily and slightly (Boraq 2016). Cost stickiness appears to be an earnings management as a result of deciding not to cut cost slack resources in periods of sales decline will result in decrease current reported net income of a company, giving an incorrect measure of the profitability of the company in this period of sales decline.

Governance mechanisms mitigate the agency problem and asymmetric cost data results from manager's decisions in adjusting operational costs (Chen et al. 2012) downward to accommodate the fall in demand. On the other hand, when the demand increases, managers adjust the resources upward by retiring the slack resources, and thus, costs will increase. Here, managers' respond to cost differently from the traditional cost model.

According to Hypo (2004), earnings management occurs when managers use decisions and financial reporting to either deceive or inspire or manipulate stakeholders about the company's underlying output based on results that rely on recorded accounting figures. To reach certain recorded earnings targets or to obtain higher compensation, Lee and Yeh (2006) described earnings management as to how managers select an accounting policy or activities that affect earnings. There are several explanations for earnings management and asymmetric cost actions to exceed earnings, loan agreements, prevent loss reporting, and meet the prediction of consensus analysts and minimize taxes last year (Shuang and Yun 2016).

Anderson et al. (2003) clarified that managers have two choices when operation falls: retaining costs when choosing to work with slack resources and cost adjustment when deciding to remove the slack resources. If they find that the costs needed to change the resources are greater than the costs incurred when

they decide to work with slack resources, they may decide not to adjust the resources when the operation falls, creating cost stickiness (Anderson et al. 2003). Wan and Wang (2011) showed that effective corporate governance mechanisms should reduce cost stickiness and improve cost control.

When management has optimistic (pessimistic) about future demand, it tends to release more (less) favorable earnings forecasts than that of investors and analysts (Cohen et al. 2018).

Anderson et al. (2003) found that the segregation between the position of CEO and Board Chairman seems to positively influence the content of information of accounting earnings.

Effective sound corporate governance practices are used as an internal control system to ensure monitoring opportunistic earnings management.

An effective and efficient board of directors is the main pillar in the corporate governance system. Thus, the board must be dominated by non-executive directors (independent board of directors), here, the opportunity to engage in a discretionary financial decision will be lower than if the board is dominated by executive directors. Board independence oversight managerial activities and prohibits managers' abuse of their control and power and maintains the interest of investors and protects their value by making credible and reliable judgments on financial decisions and financial reporting and this will in turn associated with lower earnings management. Also, where the CEO is not the same who hold the post of the chair of the board of directors (CEO duality), this does not create an environment that enables discretionary decisions concerning earnings management.

Similarly, the size board has an impact on effective monitoring. From the point of view of the agency theory, larger boards respond more to agency problems because of the substantial number of expertise included in the board of directors who monitor and review managerial actions. Thus, can increase a board's ability to prohibit or reduce managerial opportunistic earnings management behavior.

Board independence refers to the extent to which the board members are dependent on the executive members like the current CEO or managers (inside directors) and not non-exclusive directors (independent outside directors). Independent non-executive directors are viewed as a critical factor that influences the agency problem as they are representatives of the stakeholder and they are perceived as a factor for controlling and monitoring management behaviors resulting in more information transparency and disclosure.

Larger boards are likely to have an effective capacity than that held by a small board in controlling a firm's activity and is favorable to an increase in a firm's corporate governance processes, thus this is more likely to result in enhancing financial reporting quality which is associated with lower earnings management and vice versa. Thus, the size of the board is an important corporate governance mechanism. Large boards are more likely to reduce management opportunism and conflict of interest by diverting attention more to corporate performance. A larger board size improves the company's ability to identify and recognize the diversity of various stakeholders' interests, which will ultimately lead to enhancing transparency and more information disclosure. Although this opinion, but some literature argues that small companies may have higher discretionary accruals compared to large companies as the former will have decentralized or diversified management decision-making, which leads to higher discretionary accruals.

While the CEO duality is the situation where the CEO is the same person who holds the position of the board chairman, CEO duality is one of the main corporate governance mechanisms that is used to reduce the agency problem, as CEO who is accountable for the effective day-to-day operation of the day-to-day activities of the company must not be the same board chair who is accountable for the effective operation of the board.

Based on the previous illustrated literature, authors formed the second hypothesis:

H2: There is a significant association between board characteristics and earnings management.

2.4 Earnings Management and Cost Stickiness

Earnings management and cost stickiness incurred because of managers' motivation, to adjust cost adjusts in a way that not in line with the optimal resource allocation of the company (Yihuan 2018).

Internal management use earnings management which is an opportunistic behavior, to adjust the financial reports. It is not easy for investors to accurately discover the earnings management as it is not informative to investors, even if they collect more information about the company (Kama and Weiss 2013). Management usually shows good financial performance by decreasing costs when the revenue increase or decrease, note that, it is more likely to have a loss due to the decrease of sales revenue, which has an extremely negative effect on the company, thus, when revenue falls, management in under pressure and decide to decrease costs. Management adjusts costs when it expects the decrease in operating income is not permanent, managers are not willing to cut slack resources, leading to cost stickiness (Yihuan 2018). Managers do this because they want the financial performance to appear good to attract more investors and increase the stock issue price. The adjusting of accounting numbers and the information asymmetry appears to arise from managers' motivation to mislead investors that the company's financial targets have been met and hide any unfavorable results. Managers will reduce actual costs for example cut advertising expenses and general administrative fees, also reduce the allowance for bad debts and the allowance for the decrease in inventory (Jiang et al. 2015).

The agency theory considers earnings as the indicator to the capital market to test whether the company is involved in value-adding activities or not. While the stakeholder's theory believes that the management can adjust earnings to enhance their managerial interests and own benefits in an opportunistic way that conflicts with the stakeholders (El Deeb and Sobhy 2015).

In contrast to cost stickiness, to meet earnings targets, the degree of cost stickiness is diminished because managers cut costs when sales decline. This managerial act expresses a form of agency theory because they do for their self-interested and personal utility, motivated to meet earnings targets. Managers are likely to

cut idle resources when facing incentives to meet earnings targets (agency considerations) and sales decline, even if they know that the sales decline is not permanent. Cutting idle resources will cause an immediate cost saving.

Weiss (2010) found costs are asymmetric when they increase more than the growth in sales and decrease to a lesser extent than there is a fall in sales. However, when sales rise, incentives to meet earnings targets are expected to motivate managers to restrain the hiring of new resources and slow down growth in costs; this is because managers are usually under pressure to avoid reporting unfavorable news on not meeting earnings targets accompanied by sales decrease (Kama, and Weiss 2013). As the number of activities decreases, a business with anti-sticky costs will show a smaller decrease in revenue than a company with sticky costs, since anti-sticky costs result in a higher cost adjustment when the volume of activity decreases and thus a lower decrease in earnings. Yusi (2017) argued that managers may adjust the cost of the resources to achieve a certain level of earnings through real and accrual earnings management and suggested that the cost adjustment through decreasing input under falling activities is more than that of increasing input under raising activities, in turn, this makes it less likely to decrease the input level (i.e., cost stickiness) because it will be expensive to do this, but if managers are more optimistic about expected revenue, this makes them reluctant to decrease cost (Cooper and Haltiwanger 2006) (Shuang and Yun 2016).

Cost stickiness leads to cost and sales information asymmetry, as it is derived from the internal managerial strategy which investors and financial analysts do not know.

Managers with optimistic sales demand expectations are more likely to enhance cost stickiness by intentionally avoiding input cost adjustments in the sales declining period and increasing input cost adjustments in the sales downward period, i.e. management choose a sticky cost strategy if they are optimistic about future sales and decides to keep the slack capacity when the sales fall (Shipeng et al. 2018). Thus, optimistic (pessimistic) expectations of future sales will lead managers to either keep (reduce) unused resources when sales fall and will in-

crease voluntary disclosure of asymmetric information to disclose only good information (Shipeng et al. 2018).

Anderson et al. (2007) however, argued that cost stickiness viewed in the face of sales fall as a positive signal. Fixed costs are generally difficult to be adjusted during the sales falls, therefore companies usually experience a raise in the ratio of SG&A costs to sales. The higher the fixed costs in the cost structures of a company, the higher is the operating leverage of that company. In turn, when sales raise, higher operating leverage will be translated into improved profitability.

Cost adjustment decision due to economic reasons as managers maintain unused resources intending to maximize firm value when sales decreases and the adjustment costs are higher. By maintaining slack resources, managers are sending positive signals regarding their expectations of future activities and company performance (Dezie and Dewi 2014). Thus, they do not decrease the necessary capacities to operating activities. They justify this by the conservation of unused resources now will cause to costs reduction in long-term; because if the company reduce unused resources reduce now to react to the decrease in sales, the additional costs are imposed on the company to regain the same resources in the future when sales increase. Therefore, the managers conserve the resources to the cost reduction in the short-term and as a result, increasing the company earnings in the long term (Anderson and et al. 2003).

Cost adjustments happen when management grows or reduces resources, where they make the cost automatically changes corresponding to the change of existing sales volume and the current production capacity (Yu et al. 2017). Rajiv et al. (2014) found when the sales demand decrease, the idle loss grows larger due to cease of production, reducing the business activities efficiency and boosting the operating risk level due to the great capital intensity of very specialized assets.

Banker (2010) noticed that the uncertainty about the future sales volume will make management not able to accurately judge for the change of business activities and company future development. Optimistic managers expect sales volume

will increase shortly, they will decide not to adjust the cost of unused resources and may also increase input resources for the future expected favorable operation situation, which would decrease the efficiency of cost allocation, in turn, this will enhance significantly cost stickiness and consequently, earnings management and decision-making risks will increase.

Banker and Byzalov (2013) indicated that managers who are optimistic about the future sales demand will have no responsibility towards changing costs of unused resources; they will delay cost decrease even when the sales decrease, contrary, they will have a strong response to the costs in the periods when there are increases in sales revenue. On the opposite, if managers are pessimistic toward future sales activities, they will immediately cut the cost when sales volume is slowing down and will give a slow response when there is a raise in sales. This is the anti-sticky phenomenon, where the asymmetric cost reaction is due to the agency problem.

Dierynck et al. (2012) showed that the executive manager's incentives to conduct earnings management and occurs cost stickiness to meet earnings targets, managers may use opportunistic behavior to meet their interests. Anderson et al. (2003) showed that business that tends to have a large number of human resources and physical assets will have higher cost stickiness because the adjusting costs of these two types of assets is higher.

Based on the previous illustrated literature, authors formed the third and the fourth hypotheses:

H3: There is a significant association between earnings management and cost stickiness.

H4: There is a significant association between Board characteristics and cost stickiness through Earnings management as an intermediary variable.

3. Research Design and Methodology

3.1 Data and Sample Selection

The population includes all industrial companies listed on the Egyptian Stock Exchange for the period from 2015 to 2019. The study sample comprises 41 manufacturing listed companies.

The data were obtained from the annual financial statements, audit reports, and disclosure books to extract the required corporate governance data on regression models' variables related to board members and owners and executives' structure.

3.2 Research Variables and Regression Model

Figure (1) presents the research conceptual framework, showing that the board characteristics (namely, the board size, board independence, and CEO duality) are used to examine their impact on cost asymmetry information in the existence of earnings management practices as a mediating variable.

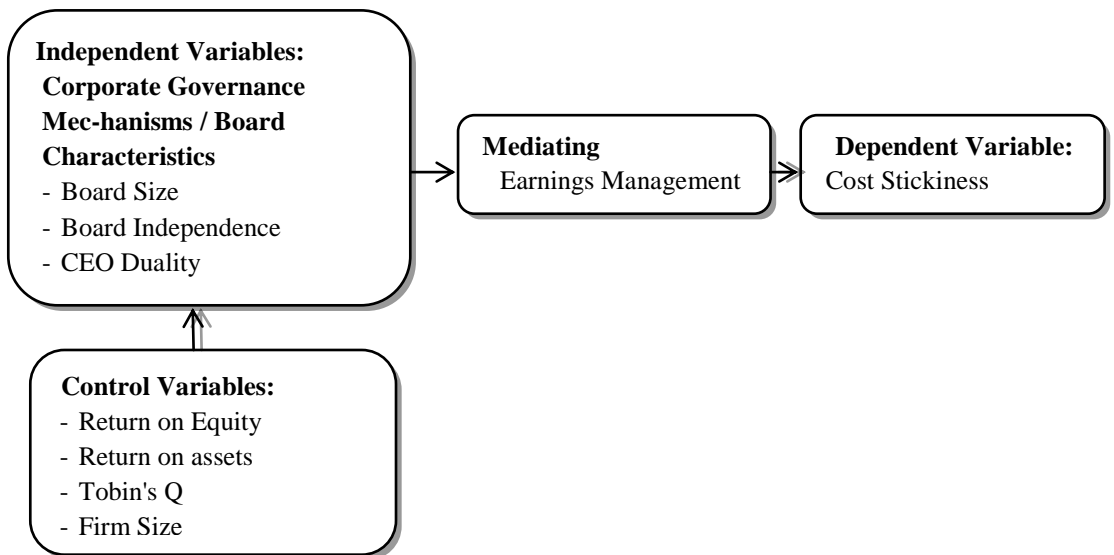


Figure 1: The Research Conceptual Framework

The statistical relationship between corporate governance/board characteristics and cost stickiness in the existence of earnings management as a moderator was tested using the following three multiple regression models:

The first regression model, used to examine the relationship between cost stickiness and board characteristics.

$$CS_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 BI_{it} + \beta_3 CEOD_{it} + \beta_4 ROE_{it} + \beta_5 ROA_{it} + \beta_6 TQ_{it} + \beta_7 FS_{it} + \varepsilon_{it}$$

Where:

Dependent variable = Cost Stickiness (CS).

β_0 = denotes a constant of the regression equation.

β_1 = BS denotes regression coefficient of board size.

β_2 = BI denotes regression coefficient of board independence.

β_3 = CEOD denotes regression coefficient of CEO duality.

$\beta_4, \beta_5, \beta_6, \beta_7$ = ROE, ROA, TQ, FS denotes control variables, the regression coefficient of return on equity, return on assets, Tobin's Q, and firm size.

It = Firm i in period t.

T_i = Year fixed effect.

ε = Standard error term.

Second: regression model used to examine the relationship between board characteristics and earnings management.

The function of corporate governance/board characteristics can be rearranged as follows:

$$BC = f(BS_{it}, BI_{it}, CEOD_{it})$$

$$EM_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 BI_{it} + \beta_3 CEOD_{it} + \beta_4 ROE_{it} + \beta_5 ROA_{it} + \beta_6 TQ_{it} + \beta_7 FS_{it} + \varepsilon_{it}$$

Where:

Dependent variable = Earnings Management (EM).

β_0 = denotes a constant of the regression equation.

β_1 = BS denotes regression coefficient of board size.

β_2 = BI denotes regression coefficient of board independence.

β_3 = CEOD denotes regression coefficient of CEO duality.

$\beta_4, \beta_5, \beta_6, \beta_7$ = ROE, ROA, TQ, FS denotes control variables, the regression coefficient of return on equity, return on assets, Tobin's Q, and firm size.

It = Firm i in period t .

T_i = Year fixed effect.

ε = Standard error term.

Third: regression model used to examine the relationship between earnings management and cost stickiness.

$$CS_{it} = \beta_0 + \beta_1 EM_{it} + \beta_2 ROE_{it} + \beta_3 ROA_{it} + \beta_4 TQ_t + \beta_5 FS_{it} + \varepsilon_{it}$$

Where:

Dependent variable = Cost Stickiness (CS).

β_0 = denotes a constant of the regression equation.

β_1 = EM denotes regression coefficient of Earnings Management.

$\beta_2, \beta_3, \beta_4, \beta_5$ = ROE, ROA, TQ, FS denotes control variables, regression coefficient of return on equity, return on assets, Tobin's Q and firm size.

It = Firm i in period t .

T_i = Year fixed effect.

ε = Standard error term.

Fourth: regression model, used to examine the relationship between cost stickiness and board characteristics and earnings management.

$$CS_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 BI_{it} + \beta_3 CEOD_{it} + \beta_4 ROE_{it} + \beta_5 ROA_{it} + \beta_6 TQ_{it} + \beta_7 FS_{it} + \beta_8 EM_{it} + \varepsilon_{it}$$

Where:

Dependent variable = Cost Stickiness (CS).

β_0 = denotes a constant of the regression equation.

β_1 = BS denotes regression coefficient of board size.

β_2 = BI denotes regression coefficient of board independence.

β_3 = CEO D denotes regression coefficient of CEO duality.

$\beta_4, \beta_5, \beta_6, \beta_7$ = ROE, ROA, TQ, FS denotes control variables, the regression coefficient of return on equity, return on assets, Tobin's Q, and firm size.

β_8 = EM Earnings Management

It = Firm i in period t.

T_i = Year fixed effect.

ε = Standard error term.

Table 1: Research Variables, Definitions, and Measures

Variables		Definition	Measure
Independent Variables	Corporate Governance Mechanisms / Board Characteristics	Board Size (BS)	Board size is the total of outside directors, executive, and non-executive directors. Size of the board of directors bladed 0 if the board members are less than seven and 1 otherwise.
		Board Independence (BI)	Board independence is the percentage of independent directors/total directors on the board. Independency of the board of directors denoted as 0 if the boards of director members are not controlled by greater than 50% independ-

				ent outside directors and denoted 1 otherwise.
		CEO Duality (CEOD)	CEO duality is where the CEO also holds the position of the board chairperson.	CEO duality is a dummy; it is assigned the value of 0 when the CEO has a dual role and 1 otherwise.
Dependent Variable	Cost Stickiness	CS	Cost behavior is considered sticky when costs increase more for activity increases than they decrease for an equivalent activity decrease.	Used Anderson, Banker, and Janakiraman (2003) (ABJ Model)
Moderator	Earning Management	EM	Earnings management is the manipulation of the company's earnings so figures match a precalculated target.	Used the modified Jones model in measuring discretionary accrual (as a proxy for earnings management).
Control Variables	Financial Performance	Return on Equity (ROE)	The ever-increasing ROE over time can mean a company is good at generating shareholder value because it knows how to reinvest its earnings wisely.	Is the percentage of net income divided by average shareholder's equity
	Operational Performance	Return on Assets (ROA)	Return on assets reflects how a firm effectively and efficiently utilizes its available resources.	Is the ratio of net income divided by average total assets.
	Market Performance	Tobin's Q (TQ)	Tobin's q measures the degree to which the company generates for its shareholders. It	Tobin's Q = Market value of equity + Book value of short term liabilities) ÷ Book value of total

			compares the book value of its assets to how much more a company is worth.	assets.
	Firm Size	FS	The total assets of the company.	Natural log of total assets.

3.3 Earnings management: Modified Jones model in measuring discretionary accruals

The discretionary accruals are calculated by measuring the non-discretionary accruals as a portion of the total accruals in the Modified Jones model.

Step 1: Calculate the total accruals as follow:

$$TACC_t = \Delta CA_t - \Delta Cash - \Delta CL_t + \Delta DCL_t - DEP_t$$

Where,

$TACC_t$ = Total accruals in year t ,

ΔCA_t = Change in current assets in year t ,

$\Delta Cash$ = Change in cash and cash equivalents in year t ,

ΔCL_t = Change in current liabilities in year t ,

ΔDCL_t = Change in short term debt included in current liabilities in year t ,

DEP_t = Depreciation and amortization expense in year t .

Step 2: Estimate the Modified Jones Model, as follows:

$$\frac{TACC_t}{A_{t-1}} = \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{(\Delta REV_t - \Delta REC_t)}{A_{t-1}} + \alpha_r \frac{PPE_t}{A_{t-1}} + \varepsilon_t$$

Where,

$TACC_t$ = Total accruals in year t divided by total assets in year $t - 1$,

ΔREV_t = Revenues in year t less revenues in year $t - 1$,

ΔREC_t = Net receivables in year t less net receivables in year $t - 1$,

PPE_t = Gross property plant and equipment in year t ,

A_{t-1} = Total assets in year $t - 1$,

α_1 , α_2 , and α_3 = Parameters to be estimated, namely alphas,

ε_t = Residuals in year t .

Step 3: Calculate the discretionary accruals as follows:

$$DACC_t = TACC_t - NDACC_t$$

Step 4: The non-discretionary accruals can be calculated as follows:

$$\frac{NDACC_t}{A_{t-1}} = \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{(\Delta REV_t - \Delta REC_t)}{A_{t-1}} + \alpha_r \frac{PPE_t}{A_{t-1}} + \varepsilon_t$$

Where,

$NDACC_t$ = Non-discretionary accruals divided by total assets in year $t - 1$,

ΔREV_t = Revenues in year t less revenues in year $t - 1$,

ΔREC_t = Net receivables in year t less net receivables in year $t - 1$,

PPE_t = **Gross** property plant and equipment in year t ,

A_{t-1} = Total assets in year $t - 1$,

α_1 , α_2 , and α_3 = Estimated parameters, namely alphas.

ε_t = Residuals in year t .

3.4 Cost Stickiness

ABJ Model by Anderson, Banker, and Janakiraman (2003) uses the term cost stickiness to refer to asymmetric cost behavior costs where the cost increase more than they decrease as demand changes. The model refers to changes in SG&A costs to fluctuations in net operating revenue. The independent variable is the logarithmic ratio of current to the preceding net sales revenue and the dependent variable is the logarithmic ratio of current SG&A to SG&A costs from the previous period.

Many proxies are used across the literature to test the cost behavior asymmetric. Among most of the common proxies is SG&A (Chen et al., 2012; He et al., 2010; Anderson et al., 2003). Following their lead, the proxy used in this study

for cost is SG&A and for activities is the sales revenue. The components of the regression model for cost stickiness are shown below.

$$\text{Log} \left(\frac{\text{SGA}_{i,t}}{\text{SGA}_{i,t-1}} \right) = \beta_0 + \beta_1 \text{Log} \left(\frac{\text{Sale}_{i,t}}{\text{Sale}_{i,t-1}} \right) + \beta_2 * \text{Dummy}_{i,t} * \text{Log} \left(\frac{\text{Sale}_{i,t}}{\text{Sale}_{i,t-1}} \right) + \varepsilon_{it}$$

Where,

SGA_{i,t} = Natural Log of company's total selling, administrative, and operating costs

.Sale_{i,t} = Natural Log of company's total sales (income)

DUM = Dummy variable, in that, if sales in year t experienced a decline compared to sales of its previous **Year (t-1) = It** is given 1; otherwise, value 0 is given.

β1 = Coefficient that measures the percentage change in costs associated with a 1% increase in sales activity.

β1 + β2 = Sum of the coefficients, β1 + β2, measures the percentage change in costs associated with a 1% decrease in sales activity. The sticky cost hypothesis is that the change in costs when sales increase differs from the change when sales decrease, that is, β2 < 0 if the sticky cost model holds.

The researchers conducted ordinary least squares approach to estimate the model of cost stickiness and the results showed that the model is statistically significant at a p-value less than 0.001; R² = 11% and F value 74.68.

Table 2: Regression Results for SG&A (OLS)

	Constant	β_1	β_2	$\beta_1 + \beta_2$	R ²	F-value	VIF
SG&A model	0.006	0.963	-0.737	0.226	11%	74.68	1.84

Table (2) indicates that the β_1 value is 0.963, which means that 1 percent change in revenue will increase the SG&A by 0.963 percent. On the other hand, the β_2 value is -0.737 which supports the existence of cost stickiness. The value of $\beta_1 + \beta_2$ is $(0.963 - 0.737) = 0.226$, which means that for each 1 percent decrease in sales 0.226 percent change happens to the SG&A cost. This finding follows Awad and Amr (2017) where the same results were reached. The results indicate the existence of cost stickiness for the companies listed in the Egyptian stock exchange market. In addition, this means that the findings are providing and empirical evidence on the cost stickiness behavior in the Egyptian environment where SG&A is sticky to the level of 0.73 percent.

3.5 Control Variables

Many factors can affect cost stickiness. This research selected the three control variables: The firm size measured by the natural logarithm of total assets is used as a control variable in examining the relationship between the board characteristics and cost stickiness. the firm profitability measured by return on asset (ROA) and return on equity (ROE). In addition, the researchers used the firm value and performance as control variables measured by a market measure which is Tobin's Q and logarithm of total assets. It is assumed that large firms are having more sophisticated control systems than small firms. Furthermore, the possibility of accounting fraud will be less in large companies compared with small firms due to the heightened scrutinizing by analysts and investors to these companies that have more opportunities to engage in earnings management practices.

4. Hypotheses Testing

Through this section, the researchers are testing the research hypotheses through conducting the appropriate statistical techniques.

4.1 Correlation Analysis

The correlation analysis had been performed to get an overview of the research variables and to determine the direction and significance among the variables of the study as follows:

Table 3: Pearson Correlation Analysis

	Board Independence	Board Size	CEO Duality	EM	Cost Stickiness	ROE	Firm size	ROA	Tobin's Q
Board Independence	1								
Board Size	.384**	1							
CEO Duality	.056*	.231**	1						
EM	-.006*	-.017*	.041**	1					
Cost Stickiness	-.195**	-.186**	.001*	-.008*	1				
ROE	.200**	.022	.052	.058*	.092	1			
Firm size	.017	.059	.054	.167*	-.383**	-.136	1		
ROA	.043	-.021	.018	.065*	.028	.061*	.100	1	
Tobin's Q	.124	.189**	.166*	.024	-.044*	-.005	.032	.063	1

**Correlation is significant at the (.01) level

*Correlation is significant at the (.05) level

The Pearson correlation analysis results are presented in Table (3), the table identifies the correlation among the research variables as follows. Table (3) shows the significant negative correlation between the board size and board independence and cost stickiness at a level less than 0.05 and 0.01. It also shows the significant positive correlation between cost stickiness and the CEO duality at a level less than 0.05 and 0.01. In addition, table (3) shows the significant negative association between the cost stickiness and earnings management at a level less than 0.05 and 0.01. These results are normal and consistent with the literature where good corporate governance is the key to reduce earnings management and by default decreasing the effect of cost stickiness. In addition, the results indicated a mixed result about the control variables (ROA, ROE, Tobin's Q, and Firm size). The results comply with the results of some researchers e.g. (Abed and Suwaidan 2012; Chen et al. 2012; Mohammad et al. 2018).

4.2 First Hypothesis

The regression analysis has been conducted by researchers for testing hypothesis number 1, which is the association between corporate governance and cost stickiness. Table (4) shows the results of the regression analysis, where board

characteristics (board independence, board size, and CEO duality) were tested for impact on cost stickiness.

Table 4: Regression Analysis Results for the Impact of Board Characteristics on Cost stickiness

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.760	.110		6.922	.000
Independence	-.020	.008	-.173	-2.457	.018
Board Size	-.010	.006	-.132	-1.839	.047
CEO Duality	.052	.050	.070	1.044	.000
ROA	.231	.186	.079	1.243	.015
Tobin's Q	.033	.023	-.095	-1.432	.050
ROE	.042	.035	.080	1.215	.026
Firm Size	.019	.003	-.370	-5.757	.000
Adj. R ² = 18.6%					

The results show that board independence and CEO duality are among the most influential on the cost stickiness with a significant level less than 0.01 and 0.05 respectively. The researchers can explain that the cost stickiness is much related to the decisions taken by the management. In that case, the independence of the board is affecting their decisions in favor of the company and that can be enhanced by reducing the CEO duality and decreasing the cost stickiness. The explanation power of the model is acceptable as adjusted R² =18.6% which means that the independent variables are the cause of 18.6% of the change in the cost stickiness. The results are consistent with the researches of (Mohammad and Zeynab 2014; Uwuigbe et al. 2014; Robert 2013). **The model can be illustrated as follows:**

$$CS_{it} = .760 - .010BS_{it} - .020BI_{it} + .052 CEOD_{it} + .042 ROE_{it} + .231 ROA_{it} + .033 TQ_{it} + .019 FS_{it} + \varepsilon_{it}$$

4.3 Second Hypothesis

To test hypothesis two, the researchers examined the relationship between the board characteristics as one of the corporate governance mechanisms and

earnings management. The regression analysis has been conducted to test the impact of board characteristics (board independence, board size, and CEO duality) on earnings management with the existence of ROE, ROA, Tobin's Q, and firm size as control variables. The regression analysis results are presented in table (5).

Table 5: Regression Analysis Results for Impact of Board Characteristics on Earnings Management

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.061	.075		-.809	.419
Independence	-.021	.006	.008	.103	.010
Board Size	-0.81	.004	.002	.021	.003
CEO Duality	.014	.034	.031	.421	.034
ROA	.082	.127	.046	.648	.017
Tobin's Q	.030	.016	.012	.164	.000
ROE	.012	.024	-.037	-.509	.012
Firm Size	.005	.002	.155	2.176	.031
$R^2 = 33\%$					

Table (5) indicates that the regression model is significant and explains 33% of the variation in earnings management practices in the sample selected. The results show that all the board characteristics proxies are significant at levels less than 0.05 and 0.01. The most influential of the board characteristics are board independence and board size with a significant level less than 0.01. These results are supporting the second hypothesis, where board characteristics are significantly affecting earnings management. The negative coefficients of the board characteristics (board independence and board size) indicate the effect on the earnings management where the more efficient corporate governance will decrease the effect of the earnings management. The results are consistent with many previous pieces of research like (El-Deeb and Elsharkawy 2019; Mahsan 2017; Shuang and Yun 2016). The regression model can be illustrated below.

$$EM_{it} = - 0.061 - .21 BI_{it} - .81 BS_{it} + .014 CEO_{it} + .012 ROE_{it} + .082 ROA_{it} + .030 TQ_{it} + .005 FS_{it} + \epsilon_{it}$$

4.4 Third Hypothesis

The regression analysis has been conducted by researchers for testing hypothesis 3, which is the association between earnings management and cost stickiness. Table (6) shows the results of the regression analysis, where board characteristics (board independence, board size, and CEO duality) and earnings management were tested for impact on cost stickiness. The results show that board independence and CEO duality are among the most influential on the cost stickiness with a significant level less than 0.01 and 0.05 respectively. The board size is not statistically significant as shown in table (6). Earnings management is significantly influencing cost stickiness at a significant level less than 0.05. The researchers can explain that the cost stickiness is much related to the decisions taken by the managers that have CEO duality and at the same time it is not affected by the board size. In that case, the independence of the board is affecting their decisions in favor of the company and that can be enhanced by reducing the CEO duality which may lead to less earnings management. The results are consistent with the researches of (Cooper and Haltiwanger 2006; Jiang et al. 2015; Yihuan 2018).

Table 6: Regression Analysis Results for the Impact of Earnings Management on Cost Stickiness

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.502	.070		7.216	.000
EM	.119	.107	.073	1.109	.269
ROE	.024	.035	.046	.703	.483
ROA	.198	.191	.068	1.036	.301
Tobin's Q	-.013	.023	-.037	-.569	.570
Firm Size	-.020	.003	-.395	-5.914	.000
R ² = 14%					

The regression model can be illustrated as follows based on the results in a table (6):

$$CS_{it} = .502 + .119 EM_{it} + .024 ROE_{it} + .198 ROA_{it} - .013 TQ_t - .020 FS_{it} + \epsilon_{it}$$

4.5 Fourth Hypothesis

The fourth hypothesis is testing the impact of board characteristics on the cost stickiness through earnings management as an intermediary variable. The analysis included the same control variables (ROA, ROE, Tobin's Q, and Log of total assets). Structural equation modeling is used based on the conditions set by (Schumacker and Lomax 2004).

Table (7) shows that all the components of the corporate governance proxy are having a significant relationship with earnings management with a significant level less than 0.05 and 0.01. Moreover, results show that earnings management has a significant impact on cost stickiness after mediating the effect of board characteristics on it. The results are consistent with those of (Xue and Hong 2016; Yihuan Li 2018; Patrick et al. 2015).

The findings of the structural equation modeling imply that earnings management has a more strong direct effect on the cost stickiness than the indirect effect of corporate governance as earnings management are based on decisions taken by management that affect directly the company costs where corporate governance are indirectly affecting the stickiness.

Table 7: Regression Weights: (SEM)

Path		Standardized Estimate	Unstandardized Estimate	S.E.	C.R.	P-value
EM	<--- Independence	.001	5.493	.005	.116	***
EM	<--- Board Size	.0001	16.290	.003	.025	***
EM	<--- ROE	-.012	.698	.022	-.537	***
EM	<--- ROA	.082	.115	.123	.667	.012
EM	<--- Tobin's Q	.030	16.715	.015	.175	***
EM	<--- Firm Size	.005	.043	.002	2.254	***
EM	<--- CEO Duality	.014	1.572	.032	.453	***
Cost Stickiness	<--- EM	.013	.163	.114	.117	***

Moreover, the model of all the coefficient values of the impact of board characteristics on cost stickiness through earnings management as an intermediary variable has been depicted in figure (2) as shown next.

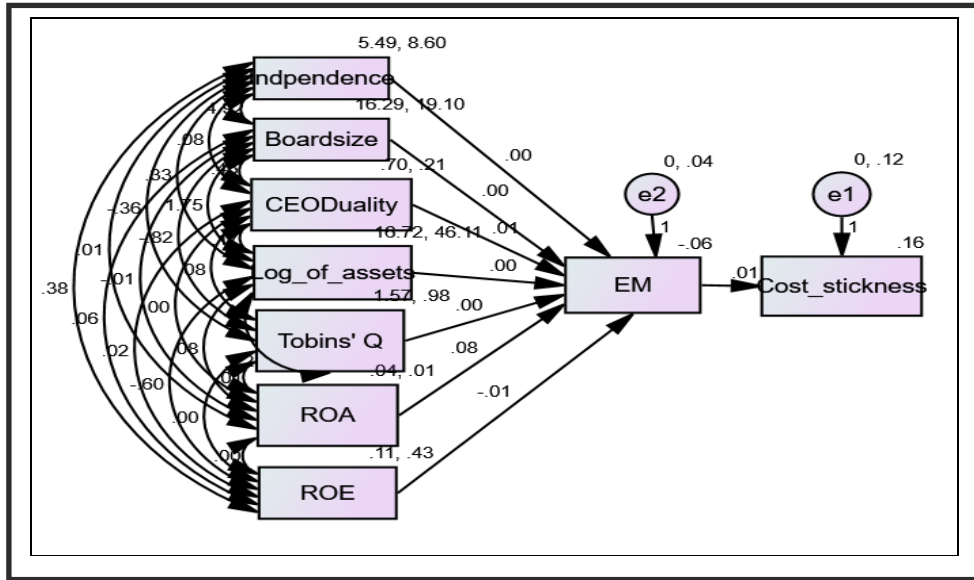


Figure 2: SEM for the Board Characteristics on Cost Stickiness through EM

Furthermore, the model goodness of fit has been conducted to test the goodness of the model. Table (8) shows the results of the goodness of fit analysis where all values are higher than the cutoff values. NFI (normed fit index), GFI (goodness of fit index), RFI (relative fit index), CFI (comparative fit index), and IFI (incremental fit index) are below and close to one (Cheung and Rensvold 2002). The goodness of fit results shows the model reliability for measuring the impact of variables on cost stickiness. The adjusted R^2 value is significant and reveals the power of the constructs to describe nearly 25.6% of the overall change in the dependent variable which is cost stickiness. The rest of the percentage is due to errors and other variables that are not included in the research.

Table 8: SEM Goodness of Fit

Chi-Square (CMIN)	50.484	Normed Fit Index (NFI)	.907
Degree of Freedom	7	Relative Fit Index (RFI)	.859
Level of Significance (P)	.000	Incremental Fit Index (IFI)	.70
Normed Chi-Square (CMIN/DF)	4.715	Tucker Lewis Index (TLI)	.851
Root Mean Square Residual (RMR)	.043	Comparative Fit Index (CFI)	.859
Goodness of Fit Index (GFI)	.912	Root Mean Square Residual Approximation (RMSEA)	.068
Adjusted Goodness of Fit Index (AGFI)	.908		
$R^2 = 25.6\%$			

The statistical results showed that that large board is preferable as it can control, monitor strategic decisions making and provide companies with diversity in an experience that can reduce the CEO dominance and also larger boards increase the corporate governance quality and result in less intervention in cost behavior and exhibit less cost stickiness.

The results showed that segregation between the role of CEO and board chairman as an effective corporate governance mechanism can increase board independence and reduce the opportunistic intervention like cost adjustment decisions and it is critical in maintaining balances against management and creates better alignment of board' interest with shareholders' interest as it exhibits less cost stickiness.

The results indicated that independent board members can mitigate accounting manipulation and earnings management and improve the faithful representation of financial annual reports more than the other board characteristics proxies in this research. Tobin's Q is used as a control variable that represents managerial performance. The premise is that the high agency cost is associated with self-interest managers. The lower Tobin's Q ratio indicates the existence of agency costs and thus poor managerial performance.

5. Conclusion

The research examined the relationship among earnings management, board characteristic, and cost stickiness. The researchers tried to provide evidence from the Egyptian companies listed in the stock exchange market. The study used a sample of 41 companies from the most active in the Egyptian stock exchange market within the period 2015–2019. The researchers used board independence, board size, and CEO duality as proxies for the board characteristics, where earnings management has been measured through modified Johns' model and cost stickiness has been measured through the log of change in sales, general and administrative expenses.

The data collected from companies' websites, annual financial statements, and the Egyptian stock exchange market. The data has been analyzed using Pearson correlation analysis, multiple regression analysis, and structural equation modeling to test the research hypotheses.

The main findings of the research included the following: first the stickiness of cost in the Egyptian companies listed in the stock exchange market the companies listed in the Egyptian stock exchange market are showing a high level of cost stickiness. Second, there is a significant association between board characteristics and cost stickiness where the regression model yielded adjusted R^2 equal to nearly 19% which means that board characteristics are explaining nearly 19% of the change in cost stickiness. Third, there is a significant association between board characteristics and earnings management, where the regression model yielded adjusted R^2 equal nearly to 33%, which is logical to the researchers where these results are consistent with many previous researches. Fourth, the impact of board characteristics on cost stickiness through earnings management as a mediating variable with the regression model yielded adjusted R^2 equal nearly 26% of the change in the cost stickiness. Based on these findings' researchers accepted all the hypotheses of the research.

The cost stickiness is occurring in most cases because of cost adjustment made by management through changing the small amounts of expenses as the capital expenditures are more difficult to manipulate. These actions by management can

be classified under the earnings management activities, where management tries to enhance the image of the company through discretionary and real activities. In some cases, a time lag can happen between the time of taking the decision and the actual time of cost reduction occurrence which can be attributed to contractual limitations. Therefore, good corporate governance helps in reducing or in some extreme cases preventing this manipulation and consequently decreasing the cost stickiness in companies.

Footnote: The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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