



جامعة مدينة السادات

## **Firm's Operational Characteristics and Internal Control Structure Effectiveness in Business Inflationary Environment: An Empirical Study on Non-Financial Firms Listed in the Egyptian Stock Exchange**

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### Abstract

This research delves into the influence of a firm's operational characteristics on the effectiveness of its internal control structure in business inflationary environment. The research hypothesis was tested employing multiple regression analysis, drawing upon data from 103 non-financial firms listed on the Egyptian Stock Exchange between 2016 and 2021, using content analyses of these firms. Primary findings indicate a significant positive relation between the firm's operational characteristics and the effectiveness of the internal control structure. Subsequent analyses revealed that introducing control variables, notably accounting complexity, the nature of ownership (family vs. non-family), and the year, substantially bolstered these relationships. This underscores the aptness of the chosen variables in examining the relationships in question. Recognizing the crucial role of the internal control structure, which serves as a managerial mechanism ensuring accurate financial reporting, operational effectiveness, and adherence to relevant laws and regulations, it becomes imperative to identify the determinants shaping its functionality. Prominent among these determinants are the operational characteristics of the firm. This study evaluates the effect of four specific operational characteristics: firm size, firm age, advantage, and sales growth on the effectiveness of the internal control structure. The effectiveness of this structure was gauged using an index based on the COSO (2013) Framework. The paper's original contribution lies in focusing on how internal control structure and its effectiveness in firms are important, and that is through developing an index, compatible with the Egyptian business environment, based on the COSO (2013) Framework.

**Keywords** Firm's operational characteristics, The effectiveness of internal control structure, Accounting complexity, The nature of ownership (family vs. non-family).

## 1. Introduction

**Financial reporting**, a cornerstone of modern business, thrives on transparency and trustworthiness. Grounded in principles from FASB, its efficiency and reliability are gauged using certain qualitative traits, such as timeliness and representational faithfulness (Bimo et al., 2019; Ying, 2016). However, achieving top-notch quality is a complex process. Two key factors shaping it are firm-specific attributes and the effectiveness of the internal control structure (Dashtbayaz et al., 2019; Bimo et al., 2019; Lotfy et al., 2021).

**Every organization relies** on a solid foundation of trust. This trust is cultivated and maintained by ensuring that all financial and operational data shared with stakeholders is accurate and transparent. An essential mechanism that guarantees this accuracy is the internal control structure (ICS). Thus, understanding how firm attributes influence ICS's effectiveness has broader implications for financial transparency and organizational trustworthiness. However, there is a challenge. The existing literature provides a mixed bag of insights on this subject. While some studies suggest a direct relationship between factors like firm size and ICS effectiveness (Soodanian et al., 2013), others paint a more nuanced picture, suggesting that multiple intertwined factors play a role (Rostami et al., 2019; Bimo et al., 2019). These contradictions create uncertainty.

**Enter the Egyptian Stock Exchange**, a bustling marketplace with numerous non-financial firms trading every day. Egypt, being a pivotal part of the Middle Eastern economic scenario, offers a unique setting for study. Yet, the academic spotlight has often missed the intricacies of this market, making the Egyptian context a less-trodden path in research. Focused on the Egyptian Stock Exchange's non-financial firms, this study intends to demystify the relationship between firm attributes like firm size, firm age, leverage, sales growth, and ICS effectiveness. The time frame chosen for this deep dive is 2016-2021, ensuring the results are both recent and relevant.

**Beyond just academia**, this research aims to plug the gaps in our understanding, especially regarding the Egyptian financial context. By employing rigorous analysis, we seek to bring clarity to an area that has, so far, offered mixed signals. The insights from this study will be crucial for firms, especially in the Arab region, providing them with guidance on strengthening their internal controls. More importantly, our findings have the potential to reshape how businesses approach trust-building, fostering a renewed emphasis on efficient and transparent financial reporting. The ripple effects of such a shift

could influence best practices in corporate governance, benefiting stakeholders across the board. In the evolving landscape of global finance, the need for reliable and effective internal control mechanisms can't be overstated. This research, with its roots in the Egyptian marketplace, aims to shed light on this critical area. By exploring the relationship between operational factors and ICS effectiveness, we not only contribute to academic discourse but also offer tangible insights for businesses. The end goal is straightforward: fostering a business environment where trust is paramount, underpinned by robust financial reporting standards.

**The remainder of the paper** will be organized as follows: section 2 discusses prior literature related to firm's operational characteristics and the effectiveness of internal control structure, and the relationship between the firm's operational characteristics and the effectiveness of internal control structure and forming the hypothesis. Section 3 discusses the research methodology and design, section 4 presents the empirical results, section 5 provides a discussion of the results, and section 6 contains the conclusion.

## 2. Literature review and hypotheses development

### 2.1 Firm's operational Characteristics

**Operational characteristics** play a pivotal role in guiding management decisions, driving choices concerning varied accounting policies and practices. Firms, in their individuality, possess unique operational characteristics, which subsequently influence the inherent uncertainties surrounding their operations, activities, and managerial incentives (Talkhan, 2017; Sharaf, 2019).

El Araby (2022) aptly defines operational characteristics as **“an amalgamation of features that encapsulate technical and organizational dimensions, ownership configurations, management directions, funding avenues, accounting strategies, and the overall financial health of firms. Additionally, they encompass tangible, human, and technological resources, acting as differentiating factors among firms.”**

**Historical research** provides testament to the profound influence of operational characteristics on a myriad of variables (Soodanian et al., 2013; Talkhan, 2017; Sharaf, 2019; Zatoot, 2019; Bimo et al., 2019). Analyzing the determinants underpinning these characteristics, a consensus emerges from studies (Soodanian et al., 2013; Talkhan, 2017; Bimo et al., 2019; Dashtbayaz et al., 2019; Rostami et al., 2019; Lotfy et al., 2021) highlighting the primacy of factors like firm size, age, financial performance metrics, growth trajectory, fiscal year-end, and organizational intricacy.

**Drawing from these insights**, it's evident that while myriad determinants mold a firm's operational characteristics, certain factors — firm size, age, financial leverage, and sales growth — stand out in their influence. Intriguingly, the effectiveness of the internal control structure emerges as a paramount variable influenced by these characteristics. Informed by this understanding, our research delves into the interplay between operational characteristics and internal control structures, specifically within the context of Egypt's evolving economic landscape.

### 2.2 The effectiveness of internal control structure

**Internal control structures** have consistently been underscored in their significance across various studies (Ying & Niu, 2009; Rice & Weber, 2012; Soodanian et al., 2013; Dashtbayaz et al., 2019; Rostami et al., 2019; Bimo et al., 2019; Phornlaphatrachakorn, 2019; Lotfy et al., 2021). Such structures, deeply embedded within firms, act as critical conduits to realize organizational objectives and targets. Furthermore, their presence has been lauded for fortifying the quality of financial reporting and providing remedies for governance anomalies. A consensus among these studies accentuates that deploying an efficacious internal control structure stands paramount in ensuring not just the quality of financial reports, but also the robustness of internal controls governing compliance, reporting, and operations.

**In elucidating the nature** of an effective internal control structure, Saeed (2014) and Gift O (2018) argue that such a structure truly thrives when it is meticulously designed and operated with the primary intent to preempt, identify, and amend material discrepancies in financial statements in a timely fashion. This perspective finds resonance in Al Sayrafi's (2021) viewpoint, which posits that the efficacy of an internal control structure is contingent upon two pillars: the potency of its design, reflecting management's adeptness at fashioning a structure that timely addresses discrepancies; and the vigor of its operation, emblematic of the seamless functioning of its varied components to realize its tri-fold objectives.

**Taking a leaf out** of the COSO (2013) framework, one can discern that the presence and interplay of five core components epitomize the effectiveness of an internal control structure. These components encompass the Control Environment, Risk Assessment, Control Activities, Information and Communication, and Monitoring (Saeed, 2014; Chen et al., 2017; Lotfy et al., 2021; Khalil, 2023b).

**It's worth noting that** this effectiveness may be subject to many aspects related to business risk and environmental changes, especially in the inflationary environment of Egypt which harms the internal control structure effectiveness, as a result of the high business risk of these firms in such an environment, that motivates the firms to revisit designing and/or operating the internal control structure, which may support its ability to prevent or/ and discover or/ and correct any material misstatement in financial reporting (EY, 2023; Khalil et al., 2024).

**In sum, the internal** control structure emerges as a linchpin within firms, orchestrating the attainment of set objectives. The structure's efficacy is intrinsically linked to, and influenced by, a host of determinants rooted in a firm's operational characteristics. This multifaceted relationship, in its dynamics, plays a pivotal role in shaping the quality of financial reporting.

### **2.3 Firm's operational characteristics and the effectiveness of internal control structure**

**Research within the realm** of firms' operational dynamics and their internal control structures is abundant and multi-faceted. A series of investigations (Doyle et al., 2007; Jokipii, 2010; Rice & Weber, 2012; Soodanian et al., 2013; Bentley et al., 2017; Lai et al., 2020; Abo Ala, 2021; Khalil, 2023a) have unearthed numerous determinants intrinsically linked to a firm's operational characteristics. Factors such as firm size, its age, leverage dynamics, instances of financial loss, year-end financial markers, and the intricacies of a firm's operational complexity are some noteworthy dimensions that have garnered attention. These attributes, researchers contend, can exert a direct or an indirect sway on the potency of a firm's internal control structure.

**However, navigating through** this labyrinth of studies, one encounters an intriguing facet: the absence of a unanimous verdict regarding the trajectory of the relationship between these operational determinants and the effectiveness of internal control structures. Such divergence in findings, where some studies might present a positive correlation while others veer towards a negative or neutral one, underscores the complexity and multifarious nature of the subject at hand.

Given the mosaic of conflicting evidences and the inherent challenges in ascertaining a definitive direction of influence, our research approach refrains from adopting a preconceived directional stance. Instead, it assumes a more exploratory disposition, aiming to delve deeper into this intricate interplay without the confines of a predetermined trajectory.

### 2.3.1 Firm's Size and The effectiveness of internal control structure

**The dimension of firm** size and its nexus with the robustness of internal control structure has been the subject of a plethora of research endeavors. Each study, it seems, furnishes a distinct facet, often adding layers to this intricate tapestry.

For instance, Doyle et al. (2007) have drawn a correlation between firm size and reported control deficiencies, with their research implying a negative association between the two. For them, firm size stands as a surrogate for the propensity of investment in an internal control structure. Their argument finds its grounding in the rationale that larger firms, blessed with the bounty of financial, human, and material resources, naturally hold an edge. Such entities, by virtue of their sheer size and resource abundance, have the prowess to weave a more resilient internal control structure in comparison to their smaller counterparts. Their conclusions resonate with the sentiment that control hiccups are a rarity in the landscape of larger firms.

**Yet, as with many** research arenas, counter-narratives exist. Rice & Weber (2012) brought forth an intriguing nuance. Their findings acknowledged that, in the rare eventuality where control deficiencies sprout in larger firms, these entities exhibit a propensity to be reticent, often withholding the disclosure of such lapses.

**Adding to the complexity**, Jokipii (2010) charted a different trajectory altogether. His exploration discerned a notable positive influence of firm size on the internal control structure. He argued that size does not just influence the mere existence of controls but also their effective operationalization, albeit indirectly. A sentiment echoed by Abo Ala (2021), who cast light on the prowess of larger firms to not only have a formidable internal control structure in place but also to ensure its effectiveness. Lai et al. (2020) further enriched this narrative by opining that smaller firms often grapple with internal control weaknesses, thereby hinting at a direct correlation between diminished size and control vulnerabilities.

**Navigating through** this quagmire of varied findings, one discerns the multifaceted nature of the relationship between firm size and internal control structures. The Egyptian Stock Exchange, with its unique milieu and market dynamics, provides a fertile ground to revisit this exploration.

### 2.3.2 Firm's Age and The effectiveness of Internal control structure

**The age of a firm** is frequently perceived as a surrogate for its evolutionary stage, a chronicle of its journey replete with the accumulation of

institutional knowledge, experiences, trials, and errors. Naturally, this progression is conjectured to bear a direct implication on the structural scaffolding of its internal controls.

**In their seminal work**, Doyle et al. (2007) highlighted this very dimension. They opined that age plays a pivotal role in determining a firm's propensity to establish a robust internal control structure<sup>(1)</sup>. Their proposition hinged on the premise that as firms mature, they gradually refine their operational procedures. Through iterations, experiences, and rectifications, older firms are conceived to have "smoothed the rough edges" of their internal control mechanisms. Consequently, the age of a firm becomes inversely proportional to its likelihood of encountering material weaknesses in its internal control structure. In simpler terms, younger firms, still in their nascent stages, are perceived to be more susceptible to such shortcomings.

**This narrative is** further buttressed by insights from Melegy (2014) and Abo Ala (2021). Both underscored the vulnerabilities inherent to younger firms. Such entities, often characterized by their turbulent nature, find themselves ensnared in a web of challenges – from grappling with organizational stability to mitigating agency conflicts and even contending with the daunting task of designing an adept internal control system sans the luxury of accumulated experience.

**Lai et al. (2020) echoed** this sentiment, drawing a link between a firm's youthfulness and its resource constraints. Their analysis zeroed in on the notion that these resource limitations, almost emblematic of younger firms, inadvertently pave the way for the emergence and subsequent disclosure of material weaknesses in their internal control apparatus.

**Gleaning insights** from this rich tapestry of research, one can posit that the age of a firm, akin to rings on a tree, is more than just a marker of time. It encapsulates an entity's evolutionary trajectory, its learnings, and its inherent structural dynamics.

### **2.3.3 Financial aspects (Leverage, Sales Growth) and the effectiveness of Internal control structure**

**The financial landscape** of a company, encompassing its profitability, cash flows, indebtedness, and earnings among other metrics, is undeniably a critical determinant of its operational vigor. Unsurprisingly, the effectiveness

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<sup>(1)</sup> The material weakness in the internal control structure in accordance with auditing standard (AS No.5) Public Companies Accountants Oversight Board (PCAOB) has been defined as "an integrated set of material deficiencies in internal control, which are likely to result in material misstatements of the annual or interim financial statements that are not prevented or detected in a timely manner".



of a company's internal control structure often hinges upon these financial parameters, as they reflect not only the firm's fiscal health but also its strategic inclinations, financial robustness, and growth trajectory.

**The scholarly domain is awash** with research underscoring this interrelation. Seminal works by Smith et al. (2019), Rostami et al. (2019), and others spotlight the various financial facets of an audit client's firm, painting a picture of its financial stability, funding sources, operational vitality, and economic expansion, as delineated by Amr (2022).

**A pattern emerges from** the annals of accounting literature, with authors such as Doyle et al. (2007) and Bentley et al. (2017) concurring that firms revealing weaknesses in their internal control structures typically exhibit certain financial characteristics. These include smaller size, elevated leverage, suboptimal financial performance, and aggressive growth trajectories. Rice & Weber (2012) further elucidate this relationship, suggesting that a financially beleaguered firm could potentially be bereft of the requisite resources to meticulously assess its internal control structure.

**Echoing these sentiments**, Soodanian et al. (2013) unveiled a clear nexus between the vigor of a firm's internal controls and its financial health. Their study unearthed direct correlations between control structure frailties and financial health metrics such as pre-exceptional item losses. Concurrently, they noted indirect associations, gauged through indicators like bankruptcy potential. Moreover, a pronounced direct relationship was discerned between internal control vulnerabilities and a firm's aggressive sales growth.

**In a similar vein**, Rostami et al. (2019) emphasized the palpable connection between a firm's leverage and sales growth patterns and the robustness of its internal control structure. Lai et al. (2020) furthered this narrative, presenting evidence suggestive of firms teetering on the edge of losses or bankruptcy being more susceptible to lapses in their internal control mechanisms.

**However, in the vast spectrum** of academic exploration, discordant notes occasionally surface. The researches of Hoitash & Hoitash (2018) and Bae et al. (2021) serve as cases in point. Both studies found an absence of significant linkage between key financial metrics such as leverage and sales growth and the incidence of internal control weaknesses.

**Given this backdrop** of multi-faceted perspectives, this study endeavors to probe deeper into the firm's operational characteristics influencing internal control structure. The spotlight will predominantly be on the effects of firm

size, firm age, financial leverage, and sales growth, combined. Grounded in the preceding literary exploration, we delineate our research hypothesis as follows: **H<sub>1</sub>**: The effect of firm's operational characteristics (Firm size, Firm age, Leverage, and Sales growth), combined, on the effectiveness of internal control structure of non- financial firms listed in Egyptian Stock Exchange.

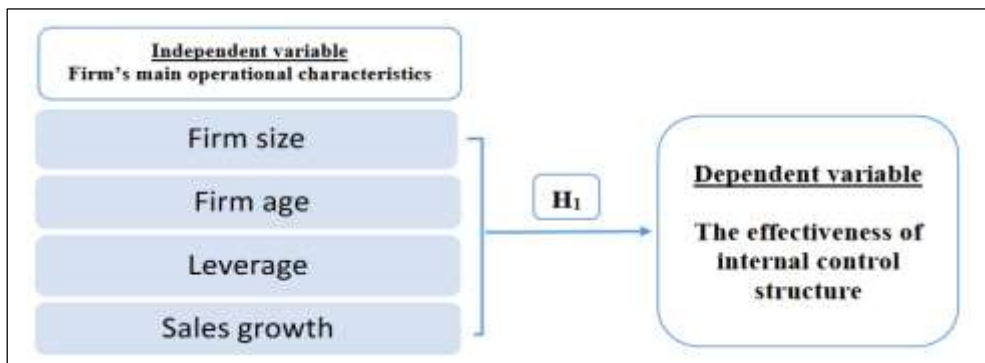
### 3. Research methodology

#### 3.1 Population and Sample of the study

**The study population** consists of non-financial companies listed in the Egyptian Stock Exchange during the period from 2016 to 2021<sup>(2)</sup>. The research focused on judgmental sample from this population, where financial companies were excluded from the scope of the study due to the different nature of their activities and the rules governing this activity differs from those of non-financial companies, as well as companies not listed in the Stock Exchange, in addition to companies listed in the stock Exchange but prepare their financial statements in a foreign currency (Abozaid et al., 2020). The final sample consisted of 600 firm- year observations.

#### 3.2 Research Design and measurements

**In this paper**, the researchers are concerned about The Effect of Firm's Operational Characteristics on the effectiveness of internal control structure, the research design as is follows:



Panel (1)

Source: researchers design

<sup>(2)</sup> The study period was determined from 2016-2021 for more than one reason, the most important of which are: After the adoption of the International Financial Reporting Standards in Egyptian in 2015, some of which focus on the problems of accounting for hedging operations, fair value, comprehensive income and its components, and other areas that require personal judgment on the part of the financial accountant, especially regarding complex accounting reports, in addition to the inflationary period as a result of the business environmental subsequences' events.

### 3.3 Definition and measurement of study variables

**3.3.1 Independent variable: Firm's Operational Characteristics**, There are many dimensions through which the firm's operational characteristics can be measured, but the research focused on each of the firm's size, firm's age, financial leverage, and sales growth, as follows: **firm's size** is measured by the Nature logarithm of total firm assets (Bimo et al., 2019), and **firm's age** is measured by the Logarithm of the number of years the company have been listed in the Stock Exchange (Soodanian et al., 2013), as well the researchers measured **leverage** by Total liabilities divided by total assets (Bae et al., 2021), finally, **sales growth** is measured by Index that is equal to one if the sale is greater than average industry sales, otherwise it is equal to zero ( Bentley et al., 2017; Khalil, 2023b).

**3.3.2 Dependent variable: The effectiveness of internal control structure (ICSE)** is measured by the effectiveness of internal control structure index based on the COSO (2013) framework and analytical hierarchy process (AHP)<sup>(3)</sup> (Chen et al., 2020; Abo Ala, 2022; Khalil, 2023b).

### 3.4 Research model

Multiple linear regressions analysis are used to test the effect of the independents variables on the dependent variable, the model as is follow:

$$ICSE = \beta_0 + \beta_1 FSIZE + \beta_2 FAGE + \beta_3 LEV + \beta_4 SALES GRW + \epsilon_{it} \quad (1)$$

Where: ICSE, FSIZE, AGE, LEV, SALES GRW as described in the previous Paragraphs,  $\epsilon$ = error term,  $it$ = for firm  $i$  in year  $t$ .

## 4. Results

### 4.1 Descriptive statistics of data

**The descriptive statistics** of the independent and dependent variables are shown in table (1). It is clear from the table that the mean value of the firm's size (8.8185) is higher than its standard deviation (.76675), and that the minimum value and the maximum value fluctuates between (6.05- 10.80). Likewise the mean value of the firm's Age (1.1948) is higher than its standard deviation (.30702), and that the minimum value and the maximum value fluctuates between (-.60- 1.61). And in contrast the mean value of both Leverage and Sales Growth (.4876 - .2583) are less than their standard deviation (.68257- .43808), and their minimum and maximum values range between (.00-

<sup>(3)</sup> It is a technique for organizing and analyzing complex decisions, providing a scientific and simple way to perform a quantitative analysis of a qualitative problem. The assessment of the internal control structure consists of different levels of qualitative and quantitative information, and is suitable for the systematic application of AHP to transform qualitative internal control problems into a quantitative one.

.00), (9.39- 1.00), respectively.

**Table (1): Descriptive Statistics**

	Mean	Min	Max	SD	N
ICSE	.5309	.26	.79	.09307	600
FSIZE	8.8185	6.05	10.80	.76675	600
AGE	1.1948	-.60	1.61	.30702	600
LEV	.4876	.00	9.39	.68257	600
SALES GRW	.2583	.00	1.00	.43808	600

#### 4.2 Correlation analysis

**Table (2): Pearson correlation between dependent and independent variable**

	ICSE	FSIZE	AGE	LEV	SALES GRW
ICSE	1.00				
FSIZE	0.254**	1.00			
AGE	0.103*	-0.037	1.00		
LEV	0.099*	-0.078	0.066	1.00	
SALES GRW	0.213**	0.693**	-0.113**	-0.011	1.00

\*\*= significant at 0.001 level, \*= significant at 0.05 level.

**Table (2) represents** the association between ICSE and the independent variables. ICSE is positively and significantly associated with FSIZE and SALES GRW with a Pearson correlation coefficient (0.254- 0.213) ( $p < 0.01$ ), respectively. Also, ICSE is positively and significantly associated with AGE and LEV with a Pearson correlation coefficient (0.103- 0.099) ( $p < 0.05$ ), respectively.

#### 4.3 Hypotheses testing

**Table (3): multiple regression results**

Variables	Model1			
	B	T	sig	VIF
Constant	0.253	4.383	0.00	-
FSIZE	0.026	3.862	0.00	1.953
AGE	0.034	2.857	0.004	1.021
LEV	0.015	2.771	0.006	1.015
Sales GRW	0.017	1.486	0.138	1.964
R <sup>2</sup>	0.093			
Adjusted R <sup>2</sup>	0.087			
F	15.308			
Sig(F)	0.00			

**It is clear from** the analysis of the results in the table (3) that the calculated value of the (F) Statistic (15.308) increased from its tabular value (3.84), which indicates the significance of the model to test that relationship. The explanatory power of the Adjusted R<sup>2</sup> model was (0.087), meaning that the independent variable explains (0.087) of the changes in the dependent variable, in addition to the decreasing of (VIF) values of these variables lower than (10), which indicates that there is no multicollinearity problem between variables.

**And by analyzing** the regression coefficients, it was found that there are significant positive effect of (Fsize, Age, and LEV), on the effectiveness of internal control structure by (0.026, 0.034, 0.015), at a probability value (0.00, 0.004, 0.006), respectively. In addition to the insignificant effect of sales growth on the effectiveness of internal control structure by (0.017), at a probability value (0.138). Therefore, **the null hypothesis was rejected and the alternative hypothesis "partially" was accepted** **The effect of firm's operational characteristics, combined, on the effectiveness of internal control structure".**

### 5. Other analyses

**In this part**, the researchers aim to retest the relationships under study with fundamental analysis, to make a comparison between the results of the fundamental analysis and other analyses, in order to provide more clarity and understanding to the relationship under study with the fundamental analysis, as well as to evaluate the strength and durability of the results reached by the fundamental analysis, and an indication of the impact of the different assumptions the researchers had adopted in light of the fundamental analysis (Amr, 2022), and in order to verify this, the researchers did both; testing the effect of accounting complexity ( segments, Foreign, and merger& acquisition), as control variable, in the context of the relationship between firm's operational characteristics and that effectiveness, and testing the effect of some other secondary variables ( Year, and FAM), in addition to the accounting complexity, as control variables, in the context of the relationship between firm's operational characteristics and that effectiveness, as follows:

**At the first phase, we added a secondary variable**, accounting complexity, to the relationship of the first hypothesis, this complexity was measured by the most common variables and reflect complexity (segments, foreign transactions, and M&A), to get line with some of previous studies (Smith et al., 2019; Rostami et al., 2019; Lotfy et al., 2021; Bae et al., 2021; Abo Ala, 2021). Which agreed that the accounting complexity creates more

obstacles that limit the work of the internal control structure, and increases the material weaknesses in this structure. The first question of the research was as follows:

**Q1:** Does the accounting complexity of non-financial firms listed in the Egyptian Stock Exchange affect the effectiveness of the internal control structure in the context of the influencing relationship between the operating characteristics, combined, of these firms and that effectiveness?

To answer this question, the multiple linear regression model was used as follows:

$$ICSE = \beta_0 + \beta_1 FSIZE + \beta_2 FAGE + \beta_3 LEV + \beta_4 SALES GRW + \beta_5 \text{complexity} + \epsilon_{it} \quad (2)$$

The following table discusses the comparison of results in the fundamental and other analyses (condition1):

**Table (4): comparison between results in the fundamental and other analyses**

Variables	Fundamental analysis				Other analyses			
	Model 1				Model 2			
	B	T	Sig	VIF	B	T	sig	VIF
Constant	0.253	4.383	0.00	-	0.268	4.646	0.00	-
FSIZE	0.026	3.862	0.00	1.953	0.020	2.840	0.005	2.174
AGE	0.034	2.857	0.004	1.021	0.038	3.177	0.002	1.038
LEV	0.015	2.771	0.006	1.015	0.018	3.270	0.001	1.061
Sales GRW	0.017	1.486	0.138	1.964	0.020	1.723	0.085	1.980
Complexity	-	-	-	-	0.051	2.632	0.009	1.236
R <sup>2</sup>	0.093				0.104			
Adjusted R <sup>2</sup>	0.087				0.096			
F	15.308				13.754			
Sig(F)	0.00				0.00			

**We found that** the model still significant after added the complexity, as a control variable, and also we found that The explanatory power of the Adjusted R2 was increased to (0.096) in model (2), compared to all previous model, which mean that entering this control variable has a significant and strong effect. In addition to the decreasing of (VIF) values of these variables lower than (10), which indicates that there is no multicollinearity problem between variables. As well as the results in table (2) above shows that there is an increasing in the significant positive effect of (Age, Lev), on the effectiveness of internal control structure, in addition to the significant positive effect of (firm size, and Complexity) on the effectiveness of internal control structure, and the insignificant effect of sales growth on the effectiveness of

internal control structure. Therefore the question, “Does the accounting complexity of non-financial firms listed in the Egyptian Stock Exchange affect the effectiveness of the internal control structure in the context of the influencing relationship between the operating characteristics, combined, of these firms and that effectiveness?”, was answered with “yes”.

In addition to the previous analyses, we added another two control variables (Year, and FAM), in addition to the accounting complexity, in the context of the relationship between firm’s operational characteristics and that effectiveness, depended on some previous studies (Ashbaugh- Skaife et al., 2008; Abernathy et al., 2014; Luikko, 2017; Chen et al, 2020; Anton et al., 2022), on the one hand, these studies agreed that the family firms tend to have a weak internal control structure to cover up their acts that serve their goals to gain fortune in conflict with the interests of minority shareholders, on the other hand, the financial year end may affect the accuracy of the auditor’s opinion and his professional judgment, in the event of that the financial year of the audit client’s firm ends on 31/12<sup>(4)</sup>, and thus his ability to evaluate the internal control structure, identify its material deficiencies and weaknesses, report and address them, if any, decreases, which ultimately affects the effectiveness of the internal control structure. So the second question of the research was as follows: **Q2:** Does the accounting complexity, the nature of ownership (family\ non-family), and the financial year end of non-financial firms listed in the Egyptian Stock Exchange affect the effectiveness of the internal control structure in the context of the influencing relationship between the operating characteristics, combined, of these firms and that effectiveness?

To answer this question, the multiple linear regression model was used as follows:

$$ICSE = \beta_0 + \beta_1 FSIZE + \beta_2 FAGE + \beta_3 LEV + \beta_4 SALES GRW + \beta_5 \text{ complexity} + \beta_6 FAM + \beta_7 \text{ Year} + \epsilon_{it} \quad (3)$$

The following table discusses the comparison of results in the fundamental and other analyses (condition2):

<sup>(4)</sup> it’s the busy season for the auditor professional work which consideration as a measurement of the intensity of his professional work, who performs the audit process of the financial reports ending on 31/12, which increasing in this period regarding to the increasing of his clients at the same time, especially if it is taken that the tax returns in Egypt are submitted during the period from 1/1 to 30/4 of each year, which leads to his being more preoccupied during that period, which ultimately affects the accuracy of his professional judgment, especially regarding continuity (Amr, 2022).

**Table (5): comparison between results in the fundamental and other analyses**

Variables	Fundamental analysis				Other analyses			
	Model 1				Model 3			
	B	T	Sig	VIF	B	T	sig	VIF
Constant	0.253	4.383	0.00	-	0.193	3.101	0.002	-
FSIZE	0.026	3.862	0.00	1.953	0.025	3.534	0.00	2.323
AGE	0.034	2.857	0.004	1.021	0.047	3.875	0.00	1.088
LEV	0.015	2.771	0.006	1.015	0.021	3.850	0.00	1.103
Sales GRW	0.017	1.486	0.138	1.964	0.009	0.767	0.443	2.162
Complexity	-	-	-	-	0.042	2.168	0.031	1.259
FAM	-	-	-	-	0.027	2.920	0.132	1.233
Year	-	-	-	-	0.016	1.507	0.004	1.049
R <sup>2</sup>	0.093				0.122			
Adjusted R <sup>2</sup>	0.087				0.111			
F	15.308				11.715			
Sig(F)	0.00				0.00			

**We found that** the model still significant after added the complexity, as a control variable, and also we found that The explanatory power of the Adjusted R<sup>2</sup> was increased to (0.111) in model (3), compared to previous model, which mean that entering the other two control variable (FAM, and Year) has a significant and strong effect. In addition to the decreasing of (VIF) values of these variables lower than (10), which indicates that there is no multicollinearity problem between variables. As well as the results in table (5) above shows that there is an increasing in the significant positive effect of (Age, Lev), on the effectiveness of internal control structure, in addition to the significant positive effect of (firm size, Complexity, and Year) on the effectiveness of internal control structure, and the insignificant effect of (sales growth, and FAM) on the effectiveness of internal control structure. Therefore the question, **“Does the accounting complexity, the nature of ownership (family\ non- family), and the financial year end of non-financial firms listed in the Egyptian Stock Exchange affect the effectiveness of the internal control structure in the context of the influencing relationship between the operating characteristics, combined, of these firms and that effectiveness?”**, was answered with **“yes”** regarding to variable (year) and **“no”** regarding to variable (Fam).



### 6. Discussions

**The paper explore** the firm's operational characteristics (measured by four drivers; Firm size, Firm age, Leverage and Sales growth) on the effectiveness of internal control structure of the non-financial firms listed in Egyptian Stock Exchange during the period (2016-2021), the paper finds that the firm's operation characteristics, combined, significantly affect the effectiveness of internal control structure , as follows:

**The result of the present** study showed that there is a positive and significant relationship between firm size and the effectiveness of internal control structure. The result of this study agrees with the result concluded by (Jokipii, 2010; Soodanian et al., 2013; Bardhan et al., 2015; Rostami et al., 2019; Lotfy et al., 2021), and contradicts the result of (Doyle et al., 2007; Rice & Weber, 2012). we think that the rationality of the significant positive impact of the firm's size on the effectiveness of internal control structure, as a result of large-sized firms possessing many material, human and technological resources that enable them to design and operate a strong and effective internal control structure, in order to protect their assets and achieve their objectives.

**There is also a positive** and significant relationship between firm age and the effectiveness of internal control structure. Such a result is a line with that of (Bardhan et al., 2015; Lotfy et al., 2021), and contradicts with (Soodanian et al., 2013; lai et al., 2020). we believes that the logical of the significant positive impact of firm's age on the effectiveness of internal control structure due to that the older firms (older in age) have a large base of individuals who have the ability and sufficient experience to understand and organize its operations properly, in addition to being more knowledge with the risks surrounding their work environment, and thus more able to design and operate a strong and effective internal control structure commensurate with that environment and these risks. Which is ultimately reflected in reducing its material weaknesses.

**Furthermore, there is a positive** and significant relationship between firm's leverage and the effectiveness of internal control structure. The result of this study is following that of (Hoitash& Hoitash, 2018; Rostami et al., 2019; Bae et al., 2021). we think that the rationality of the significant positive impact of the firm's leverage on the effectiveness of internal control structure, Where the high financial leverage leads to a decrease in the effectiveness of the internal control structure, which is due to the fact that the high leverage indicates the firm's lack of financial resources and its need for funds borrowed from others to finance its operations, also reflects its inability to invest in the internal

control structure, which may limit its effectiveness and thus achieve its three goals.

**And so on, there is also a positive** and insignificant relationship between firm's sales growth and the effectiveness of internal control structure. This result is consistent with (Bardhan et al., 2015; Bae et al., 2021), and contradicts with (Soodanian et al., 2013; Bentley et al., 2017). we believes that the logical of the positive impact of firm's sales growth on the effectiveness of internal control structure due to that the sales growth is one of the indicators of the firm's growth, which reflects the improvement of the firm's financial position and its revenue generation as a result of the increasing customer base and their demand for the goods and/or services it provides and thus the increase in its market share, which is reflected in its ability to possess more material, human and technological resources to keep pace with the needs of its customers and achieve its objectives, including; Ensuring the efficiency and effectiveness of its operations, which prompts it to invest in its internal control structure to achieve this goal, which ultimately reflects on the effectiveness of this structure. And we believe that the insignificant effect due to the reduction of the ratio of the effectiveness of ICS of our sample observed by (45.3%).

**Either in case of testing** the effect of complexity on the effectiveness of internal control structure in the context of the influencing relationship under the study, we concluded, from analytic the positive effect, that is a reflect of its negative effect (complexity) on the effectiveness of internal control structure, especially in case of classification of the majority of the observations of the study sample, which amounted to (54.7%), of the ineffectiveness of its internal control structure, and the increase of the number of the observations of the more complex study sample to reach (48.5%), which indicated the negative effect of this complexity on the effectiveness of internal control structure in the Egyptian business environment and professional practice, this results get line with (Chychyła et al., 2019; ; Lai et al., 2020; Brown et al., 2021).

**In the end,** we found that adding more two control variables (FAM, and Year) beside complexity, had made this relation more strong and more sense, although the insignificant effect of (FAM) on the effectiveness of internal control structure. On the one hand, we believed that the positive effect of the FAM on the effectiveness of internal control structure is illogical, as results of the decrease of the number of the family firms observations of the study sample, which amounted to (87) observation, which justifies our reliance on the entire sample instead of relying on family firms only or non-family firms. On the

other hand, we also believed that the positive effect of the financial year end on the effectiveness of internal control structure is illogical, because it didn't reflect the real classification of the sample observations in the Egyptian business environment and professional practice, as we found from the analysis of the observations of the study sample that (76%) of the observations of the sample firms end their financial year on 31/12, which offset by a decrease in the effectiveness of internal control structure by (45.3%).

### 7. Conclusions

**This research** undertook a profound exploration into the intricacies of the internal control structure, particularly within the context of the inflationary Egyptian business milieu. The findings are quite revelatory, underscoring a substantial decline (54.7%) in the effectiveness of the internal control structures within Egyptian entities. This decline contrasts starkly with practices observed in countries such as the USA and China. One potential reason is the diminished appreciation of the cardinal role an effective internal control structure plays in propelling a firm towards its objectives.

**The study delineated** the undeniable significance of firm-specific operational characteristics and their bearing on the potency of internal controls. Notably, attributes like firm size, age, leverage, and operational complexity emerged as salient determinants. These characteristics, unique to each entity, can shape the robustness of its internal controls.

**Given these findings,** it is imperative for regulatory and supervisory bodies in Egypt to intervene. We advocate for the mandatory disclosure of the effectiveness of internal controls for firms listed on the Egyptian Stock Exchange. Such disclosures, which are in line with global practices like those dictated by the SOX Act, will foster transparency and accountability. Complementing this, auditors should be mandated to incorporate their assessments on the effectiveness of these controls in their audit reports. The creation of a comprehensive database, classifying firms based on their disclosures pertaining to internal controls, would be a logical next step. Such a database would be instrumental in benchmarking and could align Egypt with international stock exchange practices.

**The academic realm needs** to augment its focus on the intricacies of internal control structures. Emphasis should be laid on examining determinants like operational characteristics, the inflation rate, the flotation of the exchange rate, and the growing complexity inherent in modern businesses. In the era of digital transformation, emerging facets like blockchain's influence on internal

controls, or the implications of cybersecurity risks on the sturdiness of these systems, warrant scholarly attention.

**In summation**, internal control structures are the bedrock of organizational integrity and efficiency. A plethora of research avenues beckon, exploring the multifaceted dynamics between these control mechanisms and myriad internal and external determinants. Whether viewed from the lens of internal audits or external audits, dimensions like audit quality, audit committee efficacy, and audit report timelines interplay with these controls, setting the stage for future explorations in this domain.

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