Investigating the Impact of Earnings Management on Stock Liquidity and its Effect on Capital Structure: Evidence from Egypt

Research Extracted from Master's Thesis of Accounting

By

Ahmed Saad Hassan Saad

Master's Researcher of Accounting

Faculty of Commerce, Cairo University

ahmed_saad17@foc.cu.edu.eg

Dr. Walid Shehata Mohamed Kasim Soliman

Associate professor of Accounting,

Faculty of Commerce, Cairo University

walid.kasim@foc.cu.edu.eg

Dr. Kholoud Abdelkarim Mahmoud Hussein

Associate professor of Accounting

Faculty of Commerce, Cairo University

kholoud_abdelkarim@foc.cu.edu.eg

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Investigating the Impact of Earnings Management on Stock Liquidity and its Effect on Capital Structure: Evidence from Egypt

Ahmed Saad Hassan Saad; Dr. Walid Shehata Soliman

and Dr. Kholoud Abdelkarim Hussein

Abstract:

Several studies have been conducted to investigate capital structure (CS), which is measured by leverage, and its impact on firm value. CS decisions are determined by various factors, such as growth opportunities, firm size, and profitability. Earnings management (EM) and stock liquidity (SL) are further determinants of CS. As a result, the objectives of this study are: (1) to measure the impact of EM on SL; (2) to examine the impact of SL on CS; (3) to investigate the direct impact of EM on CS; and (4) to test the mediating impact of SL on the association between EM and CS. The sample contains 94 non-financial firms with 564 firm-year observations listed on the Egyptian stock exchange (EXG 100) for the period from 2015 to 2021. The findings revealed that: First, there is a significant negative association between EM and SL. Second, there is a significant negative association between SL and CS. Third, there is a significant negative direct relationship between EM and CS. Finally, there is a significant positive indirect association between EM and CS through SL. Thus, SL acts as a mediator in the association between EM and CS.

Keywords: Earnings Management, Stock Liquidity, Capital Structure, Egypt.

1. Introduction:

Capital structure (CS) decisions are a common topic in the world of accounting and corporate finance. Ultimately, management needs to determine the level of debt and equity used to finance their operations and programs to enhance firm value while decreasing the overall cost of capital (Hackbarth, 2009). The real fundamental financial performance of a business (i.e., operating cash flow) would only be accessible to insiders due to management discretion or judgments in declared profits. Thus, earnings management (EM) enables directors to fund inappropriate projects that optimize their personal benefits at the cost of other stakeholders who have limited access to information. Accordingly, management of earnings may help insiders engage in illegal and unethical practices (An et al., 2016).

Management aims to choose the optimal CS mix to achieve the lowest cost of capital. This cost is made up of the total cost of equity and the total cost of debt together. As a result, management prefers to use a source of finance that has the lowest cost. Management could control the disclosed level of information to direct investors' decisions through some tools. These decisions are reflected in CS decisions. For cases where the cost of equity is higher than the cost of debt, management uses EM tools to provide investors with information indicating a better firm's performance, encouraging investors to increase equity shares more than debt capital. In other words, increasing EM decreases leverage (Beiruth et al.,2021). However, if the cost of equity is higher, management uses EM tools to convince investors to increase debt capital in CS (Ajay and Madhumathi, 2015; Okyere et al., 2021).

It is critical to recognize how EM affects CS since managers practice EM to hide the performance of the business from different stakeholders in an effort to preserve their personal power advantages (Leuz et al., 2003). Lenders, such as banks, depend on earnings quality to grant credit facilities and impose the appropriate loan rates (Bharath et al., 2008). The association between EM and firm value, through enhanced stock liquidity (SL) or a lower cost of capital, has an impact on shareholders' wealth (Ng 2011; Lang et al., 2012).

However, the relationship between EM and CS has only recently attracted the interest of accounting and finance researchers. Furthermore, previous studies on the relationship between EM and CS have shown mixed results in the context of developing countries (e.g., Dang et al., 2018; Beiruth et al., 2021; Okyere et al., 2021). Moreover, studies addressing the association between EM and CS are limited and need further consideration, especially in developing countries such as Egypt, which have features different from those of developed countries.

Further, the simplicity with which a company could obtain outside capital through public offerings is tied to the liquidity of its shares; less liquid shares typically have increased issuing expenses, which results in a higher equity cost (Udomsirikul et al., 2011). As a result, companies with more liquid shares are more inclined to use them than companies with less liquid shares. Therefore, liquidity is probably a factor in CS decisions.

The impact of SL on CS depends on some determinants; the first determinant is ***the degree of asymmetrical information***. At a low level of information asymmetry, more information is disclosed, encouraging investors to purchase shares in these firms, which could increase investment in equity while reducing investment in debt. The second determinant is ***the cost of capital***. Increasing SL decreases the cost of equity, which boosts equity shares in firms' CS. The third determinant is ***the expectation for future performance.*** Since SL decreases the uncertainty regarding future cash flow for the business. Thus, the risk of default and consequently the costs of debt decrease. Thus, raising capital through leverage becomes more appealing to firms (Graham & Leary, 2011; Zilin et al., 2020).

However, most of the research addressing how SL affects CS was conducted in the USA and other developed countries. Also, studies in developing countries provided either unclear or conflicting findings. A negative relationship between SL and CS was found in several prior studies (e.g., Lipson & Mortal, 2009; Chen et al., 2020), whereas other studies found the opposite (e.g., ElBannan, 2017; Cheung et al., 2018). In addition, certain studies discovered an insignificant correlation between SL and CS. (e.g., Sharma & Paul, 2015; Abdulla & Ebrahim, 2020).

Two approaches explain the role of EM in controlling SL**.** ***The first approach*** indicates the presence of information asymmetries. As a result of the implications of adverse selection arising from the presence of informed participants who benefit at the expense of uninformed participants, the market makers (liquidity providers) will likely expand their bid-ask prices to offset their expected financial losses with informed investors. Therefore, when there is asymmetrical information, management is motivated to manage earnings with the desire to conceal the firm's bad performance, thus decreasing the informativeness of SL (Handa et al., 1998; Jiraporn et al., 2008; Bhattacharya et al., 2013;).

The second approach claims that greater transparency enhances the volume of transactions, which in turn increases SL since investors are attracted by the level of disclosure and are motivated to make large transactions, which results in reduced trading expenses and improved SL (Healy & Palepu, 2001). Managers may manipulate earnings to send personal information and, as a result, improve the earnings' informational value, which would be helpful to different market participants (Jiraporn et al., 2008). Moreover, information mechanisms decrease the spread of bid-ask and enhance SL (Glosten & Milgrom, 1985). Finally, management aims to provide suitable information to shareholders about performance and projected earnings, which improves the informativeness of SL (Lev, 1988).

The relationship between EM and SL has not been fully demonstrated by empirical evidence in accounting and finance literature. Most of these studies have provided unclear or conflicting results. Several studies revealed a negative correlation between EM and SL (e.g., Hunjra et al., 2020; Amawi & Nassar, 2021; Mendoza et al., 2022), whereas many other studies found the opposite (e.g., Al-Jaifi, 2017; Trang & Linh, 2020; Özkaya, 2021). These results indicate an ongoing debate on the relationship between EM and SL.

This research contributes to the existing literature on the association between EM and SL, SL and CS, and EM and CS. This research adds new empirical evidence to the accounting and finance literature in the field of investigating the mediating impact. As far as the author knows, this is the first study to investigate the mediating influence of SL on the relationship between EM and CS using data from the Egyptian context. The mediating impact of SL on the association between EM and CS can be discussed in two phases. The first phase discusses the role of EM to control SL, then the second phase discusses the impact of SL on CS.

The remaining sections of this study are organized as follows: Section 2 involves a review of related literature and the formulation of hypotheses. The variables measured, research model, sample selection, and data collection are all described in Section 3, along with the analysis of data and a discussion of the results. Section 4 then shows the study's conclusion, followed by the limitation and direction for future research in Section 5.

2. Literature Review and Hypotheses Development:

2.1 Earnings Management and Stock Liquidity

Managers may manipulate earnings to convey personal information, improving the information value for earnings, which would be helpful to market participants. As a result, EM can improve the information value of earnings (Jiraporn, et al., 2008). This informative perspective aims to provide more information regarding the companies' prospects and future cash flows to stakeholders (Arya, et al., 2003).

On the other hand, management may falsify information or attempt to provide less information by manipulating earnings to conceal poor performance. As a result, there is less transparency and poor financial reporting quality (Jiraporn et al., 2008). This approach is known as opportunistic EM, "It refers to deceiving stakeholders by pursuing the manager's interests; therefore, the reported earnings are less accurate" (Bergstresser et al., 2004).

Prior and recent studies provided evidence on the relationship between EM and SL. However, these studies showed inconsistent findings. Some studies confirmed ***a negative and significant association*** between them; LaFond et al. (2007) found an inverse association between discretionary smoothness and SL for a sample of non-US listed firms from 21 countries. Chung et al. (2009) used data of non-financial firms from the Russell 3000 index. The findings revealed that companies that manage earnings incur greater liquidity costs. In addition, the findings indicated that asymmetric information and higher agency costs are linked to aggressive earnings manipulation. Therefore, the bid-ask spread will be raised by market makers, which will result in a decrease in liquidity.

Many studies agreed with this result, such as Moradzadeh et al. (2010) used listed firms on the Tehran Stock Exchange (TSE) as a sample, Fathi et al. (2011) relied on a sample of 81 firms, Ascioglu et al. (2012) used a sample of publicly traded firms in the US; Bafghi (2014) who used a sample of 80 firms; Nowghabi et al. (2015) used a data set of TSE firms; and Ajina & Habib (2017) depended on a sample of French firms, Agustia et al. (2019) utilized a selection of 963 listed companies on the Indonesian Stock Exchange; Hunjra et al. (2020) utilized a sample of 114 companies; Amawi & Nassar (2021) used a sample of 53 selected listing firms on the Amman Stock Exchange (ASE); and Mendoza et al. (2021) depended on a sample of 478 Latin American firms.

In contrast, some studies found evidence of ***a significant positive association*** between variables; Chen & Sami (2006) using a data set of 38 non-US firms, the results revealed a positive relationship between the amount of readjusted earnings and trading volume. Khan (2013) examined the correlation between EM and SL using a sample of 72 companies listed on Karachi Stock Exchange (KSE) during the period 2005–2009. A significant positive correlation between EM and liquidity was found in the results. As a result, companies with widely managed earnings have tighter share price spreads, making the stock more liquid.

Many studies agreed with this result, for example, Bar-Yosef & Prencipe (2013) used a sample of 130 Italian-listed firms, Riahi et al. (2013) utilized a sample of 19 Tunisian Stock Exchange firms. Sayari & Omri (2017) relied upon a sample consisting of 299 observations of firms from the Tunisian Stock Exchange; Al-Jaifi (2017) depended on a sample of listed companies on the Bursa Malaysia; Trang & Linh (2020) used 170 listed firms on the Vietnam Stock Exchange as a sample, Özkaya (2021) who used a sample of Turkish firms.

However, other studies supported ***insignificant associations*** between the variables. Arar et al. (2018) analyzed the association between EM and stock price liquidity for a sample of 49 companies listed on the ASE from 2010 to 2015. The findings showed that EM and stock price liquidity were found to have a non-significant relationship.

Based on the above discussion, the researcher confirmed disagreement about the association between EM and SL. Studies that supported a negative association demonstrated that firms use EM tools to deceive stakeholders and hide their poor performance. As a result, information asymmetry increases, making stocks less liquid. However, other studies, which supported a positive association, demonstrated that management manipulated earnings to send internal information and, as a result, improved the informational value of earnings and decreased the asymmetric information problem. Therefore, investors will be motivated to make large transactions because there are more market orders, which leads to decreased transaction costs and therefore improved SL.

The reason for these mixed results were due to varieties in stock market efficiency, varieties in information asymmetry levels, and the dominance of debt lending. As a result, the first hypothesis is stated as follows:

H1: There is a significant association between EM and SL.

2.2 Stock Liquidity (SL) and Capital Structure (CS)

According to the static trade-off theory, companies trade debt benefits, mostly tax deductions, for debt costs associated with financial difficulty and bankruptcy. Therefore, the optimal CS of a company is identified by balancing the net cost of equity capital and the net cost of debt capital when the company needs financing (Lipson & Mortal, 2009). Thus, this theory implies that decreasing the cost of equity through enhanced SL lowers firm debt ratios and enhances the firm's dependence on equity capital, resulting in less leveraged CSs

According to Myers' pecking order theory (1984), companies will first choose to finance their projects with internally generated funds and then pursue external financing if such sources are unavailable. Asymmetric information in the capital markets will cause companies to rely on retained earnings first, then debt sources, and lastly equity to finance new projects. As a result, high liquidity securities would signal lower asymmetric information, which would lead to more equity financing because new issuance would be discounted (Lipson & Mortal, 2009). Moreover, as an implication of this theory, when information asymmetry is low (i.e., high SL), companies should issue new shares instead of using debt capital (Fama & French, 2002). As a result, companies with fewer information problems tend to use equity financing instead of debt financing because of lower issuance costs, which results in less leveraged structures.

The association between SL and CS, measured by leverage, has been investigated by multiple previous studies, but the empirical findings have been inconsistent. Some studies confirmed ***a negative and significant association*** between SL and CS; Lipson & Mortal (2009) investigated the association between stock market liquidity and CS choices made by companies. By categorizing U.S. companies from 1986 to 2006 into size quintiles and then liquidity quintiles, they showed that increased equity market liquidity decreases the cost of issuing stock, incentivizing company directors to issue more new stocks than debt financing.

Many studies supported this result, such as Udomsirikul et al. (2011) utilizing a sample of Thai 707 companies; Leelakasemsant (2014) relied upon a sample of listed firms on the Pakistani Stock Exchange (PSE), Rashid & Mehmood (2017) employed a sample of listed firms in PSE, Nadarajah et al. (2018) used a sample of Australian firms, Hanselaar et al. (2019) used a sample of firms in 38 countries using quarterly data, Dang et al. (2019) used a sample of 19,939 firms in 41 countries, Chen et al. (2020) used a sample of firms listed on the Chinese stock market, and Dutta et al. (2022) used a sample of top the 100 non-financial listed firms listed in the India Stock Exchange. ***In contrast,*** some studies have found ***a positive and significant relationship*** between SL and leverage; ElBannan (2017) found a positive association between liquidity and debt ratios in family and non-family Egyptian companies listed on the EGX from 2006–2014. Cheung et al. (2018) agreed with this result using a sample of U.S. firms.

However, some studies have confirmed that there is an ***insignificant association*** between SL and CS. Haddad (2012) analyzed the association between SL and CS considering a sample of 38 industrial companies traded on the ASE from 2000 to 2009. The findings demonstrated that SL has no relationship with the CS. Sharma & Paul (2015) agreed with this finding for a sample of 279 Indian firms. Abdulla & Ebrahim (2020) supported this finding for a sample of Saudi industrial firms. In accordance with the previous argument about the connection between SL and CS, the second hypothesis is stated as follows:

H2: There is a significant association between SL and CS.

2.3 Earnings Management (EM) and Capital Structure (CS)

Due to the adverse selection problem and agency costs on the capital markets, there is a greater information asymmetry among investors, which has negative impacts such as increased trading costs and a decrease in interested investors' numbers and trading volume (Lev, 1988). The pecking-order theory and the trade-off theory claim that businesses with greater information asymmetry will prefer to employ debt financing over equity financing because the latter has higher issuance costs, and consequently, as an implication of this theory, decreased SL leads to more leveraged capital structures.

The signaling theory proposes that when there is an information asymmetry between managers (insiders) and investors (outsiders), CS decisions are exploited to convey private information on the company's future earnings (Miller & Rock, 1985). Thus, as an implication of this theory, information asymmetry is reduced by management signaling more private information about the company's performance and projected earnings. This improves the informativeness of SL and increases its liquidity, leading to less leveraged capital structures.

Many studies were interested in the association between EM and CS, which is measured using leverage. However, there is no agreement about the nature of this association. Some studies confirmed ***a significant negative association*** between EM and leverage; Orazalin & Akhmetzhanov (2019) using a sample of 73 non-financial firms traded on the KSE, the empirical evidence showed that debt is inversely impacted by EM. Shoaib & Siddiqui (2020) supported that result for a sample of U.S. firms. Gregova et al. (2021) agreed with this result for firms in the Visegrad Cooperation countries. Beiruth et al. (2021) supported this finding using a data set of 3,503 firms. ***In contrast*****,** some studies have found ***a significant positive association*** between EM and leverage; Tahir et al. (2011) reported that managing earnings can significantly improve the capital formation of firms, based on an evaluation of non-financial firms listed on the KSE. Ajay and Madhumathi (2015) supported this result for a sample of listed Indian, foreign, and group firms.

Many studies agreed with this positive relationship between EM and leverage, including Nikoomaram et al. (2016) relied on a sample of 119 industrial firms listed on TSE; Dang et al. (2018), who agreed with a positive association but mentioned that it was less obvious in countries that have better institutional environments; Al-Mohareb & Alkhalaileh (2019) supported the positive association between EM and leverage for a sample of 44 Jordanian manufacturing firms traded on the ASE, as well as Okyere et al. (2021) for a sample of industrial listed firms from selected countries in sub-Saharan Africa.

The researcher concluded that the association between EM and CS did not have any agreement based on the discussion above. Studies that confirmed the negative association indicated firms with fewer asymmetric information issues preferred equity over debt, leading to less leveraged structures. Furthermore, these firms apply EM in an informative manner. As opposed to that, other studies that revealed a positive association indicated that companies with higher information asymmetry face higher transaction costs, and when management needs external financing, they favor debt over equity due to the reduced informational expenses associated with debt, resulting in more leveraged CS. Based on the previous argument regarding the relationship between EM and CS, the third hypothesis is:

H3: There is a significant direct association between EM and CS.

Previous literature has investigated the direct relationship between EM and CS. To the knowledge of the author, no studies are addressing the indirect association between EM and CS through SL as a mediator. Thus, the researcher seeks to fill this gap in the literature by investigating the impact of EM on CS through SL as a mediator. Based on this gap the fourth hypothesis is:

H_4: There is an indirect association between EM and CS through SL as a mediator.

3. The Research Method:

3.1 Sample selection and Data collection:

The initial sample consists of all companies that were listed on the Egyptian stock exchange between 2015 and 2021. Financial companies were excluded because their financial reporting environments differed from those of non-financial companies. The final sample includes 94 companies, representing 564 firm-year observations from 2015 to 2021. The criteria for selecting the sample are as follows:

- Global Industry Classification Standard (GICS) sectors with fewer than eight companies were excluded since the prediction of cross-sectional accrual models requires at least eight companies per sector-year combination (Ferguson et al., 2004).
- The company must be publicly listed during the selected time period. Consequently, only companies that were publicly listed during that period were chosen.
- Both the stock and financial data for the selected time period must be complete. Companies with incomplete data were excluded.
- The accounting year for all selected companies must end on December 31 to unify the impact of EM on the other variables and capture the economic events for each year in the study period and their impact on EM practices (Peasnell et al., 2000).

The financial data necessary for measuring both EM and CS was obtained from the annual financial statements obtained from the companies' official websites, Mubasher Misr, and Egypt for Information Dissemination (EIGD). Further, stock data (daily bid and ask prices) as well as market capitalization data were obtained from the EGX information center. Table (1) summarizes the GICS sectors used and the number of firms satisfying the data requirements in each sector along with its percentage.

Table (1) The GICS sectors, the number of firms, and the percentage of each sector in the sample.

GICS sector	Number of Firms	Percentage
Consumer Discretionary	13	13.8 %
Consumer Staples	13	13.8 %
Health Care	8	8.5%
Industrials	16	17%
Materials	20	21.3%
Real estate	24	25.5%
Total	**94**	**100%**

Source: Prepared by the researcher

3.2 The Research Model:

Figure (1) demonstrates the research model, as it shows the hypothesized relationships between the variables, in addition to the statistical hypotheses. Figure (1) also shows that EM represents the independent variable, SL represents the mediating variable, CS represents the dependent variable, and finally, it shows the control variables.

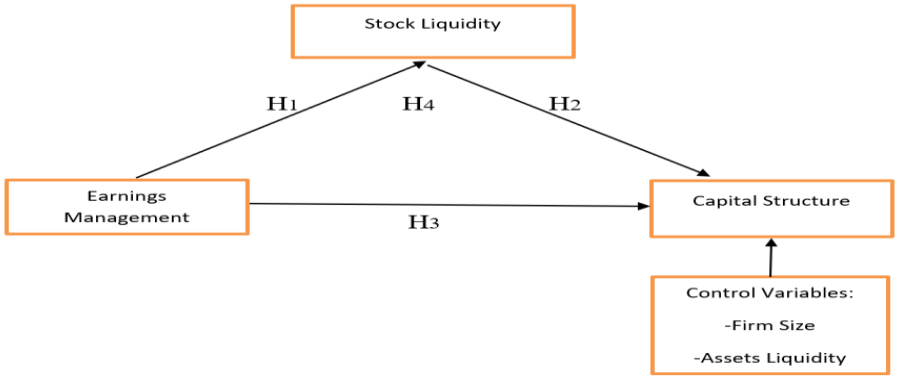


Figure (1): The Research Model

Source: The Researcher

3.3 Variables Measurements:

Earnings Management

The cross-sectional form of the modified Jones model (Dechow et al., 1995) is employed as a proxy for EM. The degree of discretionary accruals for a certain firm was computed using this method as the difference between the firm's total accruals and its non-discretionary accruals (NDAC), as determined by equation (1):

$$NDAC_{ijt} = \alpha j(1/TA_{ijt-1}) + B1j(\Delta REV_{ijt} - \Delta REC_{ijt}/TA_{ijt-1}) + \beta 2j(PPE_{ijt}/TA_{ijt-1}) \quad (1)$$

Where,

$NDAC_{ijt}$	Non-discretionary accruals for firm i in sector j in financial year t;
TAC_{ijt}	Total accruals for firm i in sector j in financial year t;
ΔREV_{ijt}	The change in firm i revenue in sector j from year t to t-1;
ΔREC_{ijt}	The change in accounts receivables for firm i in sector j from year t and year t-1.
TA_{ijt-1}	Total assets for firm i in sector j at the end of the prior year t-1;
PPE_{ijt}	Total property, plant, and equipment for firm i in year t;

First step: αj, β1, and β2 are sector-particular coefficients assessed by applying the following cross-sectional regression analysis of the preliminary Jones model [2]:

$$TAC_{ijt}/TA_{ijt} = \alpha j(1/TA_{ijt-1}) + B1j(\Delta REV_{ijt}/TA_{ijt-1}) + \beta 2j(PPE_{ijt}/TA_{ijt-1}) + \varepsilon_{ijt} \quad (2)$$

Second step: The coefficients generated from equation (2), will be used in equation (1) to get the non-discretionary part of total accruals.

In this research, total accruals were evaluated using the cash-flow method (Hribar & Collins, 2002). According to equation (4), total accruals are calculated by dividing net income before extraordinary items (NI) by cash flow produced by operating activities (OCF) (Wang, 2006):

$$TAC_{ijt} = NI_{ijt} - OCF_{ijt} \quad (4)$$

All elements included in the model will be scaled by the lagged total assets of the previous year (t-1).

Third step: Equation (1) was used to calculate NDAC after using the coefficients generated from equation (2), and equation (3) was used to calculate the discretionary accruals (DAC) amount for firm I in sector j for year t:

$$DAC_{ijt} = TAC_{ijt} - NDAC_{ijt} \quad (3)$$

The degree of EM was evaluated in this research using the absolute value of DAC.

The primary modification of the earlier Jones model is that the revenue change is now taken into consideration together with the change in accounts receivable throughout the event time span to improve the measurement of discretionary accruals. The modified Jones Model inherently presupposes that all variations in credit sales throughout the event time span were caused by earnings manipulation. If such adjustment is effective, the estimation of EM in situations where earnings manipulation has occurred using the manipulation of revenues must no longer be skewed towards zero (Deshow et al., 1995).

Stock Liquidity

The quoted spread is used as a proxy for SL as the mediating variable (inverse liquidity measure). When a market is highly liquid, investors can readily purchase and sell shares without difficulty or price volatility. As a result, the quoted bid-ask spread is used to measure SL to capture trading costs. Therefore, the higher the quoted spread, the lower the liquidity (Rhee

& Wang, 2009). Given the daily bid and ask prices, the following computation is made:

$$Q\_SPRD_t = (Askid_{it} - Bidid_{it}) / Mid_{it}$$

Where;

Q_SPRD_t	The Quoted Spread Ratio of year t.
$Askid_{it}$	The Ask Price of stock i on day d of year t.
$Bidid_{it}$	The Bid Price of Stock i on day d of year t.
Mid_{it}	The Mid-Point is calculated as the average value of the bid and ask prices of Stock i on day d of year t.

Capital Structure

Considering the existing CS literature (e.g., Baker & Wurgler, 2002; Udomsirikul et al., 2011; Elbannan 2017; Dang et al., 2019;), the current study uses the two most widely employed measures of leverage; book leverage and market leverage. Book leverage is the entire book value of debt over the entire book value of assets of the firm over period of time and is measured as follows:

$$B\_LEV_{it} = \frac{STD_{it} + LTD_{it}}{TA_{it}}$$

Where;

STD_{it}	Total Short-Term Debt of firm i in year t;
LTD_{it}	Total Long-Term Debt of firm i in year t;
TA_{it}	Total Book Value of Assets for firm i in year t.

Market leverage is the entire book value of debt over the entire sum of the market value of assets and total debt of a firm over a period of time and is measured as follows:

$$M\_LEV_{it} = \frac{STD_{it} + LTD_{it}}{(STD_{it} + LTD_{it}) + MVE_{it}}$$

Where;

STD_{it}	Total Short-Term Debt of firm i in year t;
LTD_{it}	Total Long-Term Debt of firm i in year t;
MVE_{it}	Market Value of Equity of firm i in year t; is calculated by multiplying the number of shares outstanding by the share price on the last trading day of a year

Control Variables

Following past studies, the current study employs two control variables: ***firm size and asset liquidity***. Firm size (F-SIZE) is measured using the natural log of total assets. According to the trade-off theory, there is a positive association between organization size and leverage levels because strong corporations are less likely to fail since they are highly differentiated (Rajan & Zingales, 1995). Moreover, large companies have lower agency costs for debt. Furthermore, larger enterprises tend to have fewer volatile cash flows and greater accessibility to the debt markets (Fama & French, 2002). Therefore, this research predicts a positive relationship between firm size and leverage (Udomsirikul et al., 2011; Chen et al., 2020).

The current ratio is used as a proxy for companies' asset liquidity (ASS-LIQ). Moreover, according to the pecking-order theory, businesses with high liquidity often use their own resources, which lowers the amount of corporate debt by allowing current loans to be repaid (Purba et al., 2020). Therefore, this research predicts a negative relationship between assets' liquidity and leverage (Udomsirikul et al., 2011). Table (2) shows the main research variables and their proxies.

Table (2)

Variables measurement

Variables	Proxies		
	Name	Abb.	Measure
Independent Variable Earnings Management (EM)	Jones Model	DACC_EM	DACC_EM it= $TA_t / A_{t-1} - NDA_t / A_{t-1}$
Mediator Variable Stock Liquidity (SL)	Adjusted Bid-Ask Spread	Q_SPRD	$Q\_SPRD_{it} = (\frac{Ask_{it} - Bid_{it}}{Ask_{it} - Bid_{it}/2})$
Dependent Variable Capital Structure (CS)	Book leverage	B_LEV	$BL_{it} = \frac{Total\ Debt_{it}}{Total\ Assets_{it}}$
	Market leverage	M_LEV	$ML_{it} = \frac{Total\ Debt_{it}}{Debts_{it} + market\ capitaization_{it}}$
Control Variables	Firm size	F_ Size	Natural log of total assets.
	Assets Liquidity	ASS. LIQ	Ass. LIQ = Current assets / current liabilities.

Source: Prepared by the researcher

3.4 Statistical Analysis and Hypotheses Testing

The structural Equation Modeling (SEM) method is used to process data by running "Smart PLS" software.

3.4.1 Descriptive Statistics:

Table (3)shows some descriptive statistics on the independent, dependent, and control variables of the study.

Table (3)

Descriptive Statistics for Study Variables

Variables	N	Mean	Median	Min	Max	STDEV.	Kurtosis	Skewness
DACC_EM	564	0.038	0.022	0.000	0.295	0.047	2.816	1.805
Q_SPRD	564	0.055	0.051	0.007	0.111	0.024	-0.349	0.532
B_LEV	564	0.177	0.158	0.000	0.533	0.161	-0.498	0.686
M_LEV	564	0.252	0.200	0.000	0.831	0.242	-0.466	0.774
F_SIZE	564	20.696	20.708	17.251	25.493	1.929	-0.782	0.255
ASSET_LIQ	564	1.852	1.558	0.220	3.955	1.046	-0.343	0.824

Source: Data Processed 2022.

Table (3) reveals that all variables fall within the normal skewness values of -3 to +3 and the Kurtosis values of -10 to +10, which demonstrates that the distribution of data is normal, thus enhancing the reliability of the findings.

3.4.2 Model goodness of fit:

Researchers generally depend on two indices for testing the fit of the model under study. The first method is the Normed Fit Index (NFI). NFI has a value between 1 and 0; the closer the NFI is to 1, the better the model fits (Hair et al., 2017). The second method is the Standardized Root Mean Square (SRMR). SRMR with a value of less than 0.08 is considered a good fit (Hu & Bentler, 1998; Hair et al., 2017).

As shown in Table (4), the NFI is above (0.90), and SRMR is less than (0.08). Therefore, the model has a good fit. Furthermore, it could be concluded that the indicators are appropriate and fit into the model. Therefore, the proposed model is reliable, and its results are valid and can be generalized.

Table (4)

Testing Model Goodness of Fit

Test of Model Fit	Accepted Level	Default Model
SRMR	SRMR< 0.08	**0.023**
NFI	NFI ≥ 0.95	**0.969**

Source: Data Processed 2022.

3.4.3 Testing the Validity and Reliability of the Structure Model:

Discriminant validity:

When there is more than one measure (indicator) for each variable. The point is that the measure can only express the variable it represents. This can be measured using cross-loading because each measure should only express or have high loads on the variable it expresses. Cross loadings are shown in Table (5):

Table (5)

Values of Discriminant Validity (Cross Loading)

	ASSET_LIQ	CS	EM	F_SIZE	S_LIQ
ASS. LIQ	**1.000**	-0.522	0.049	-0.448	0.211
B_LEV	-0.476	**0.852**	-0.051	0.399	-0.026
DACC_EM	0.049	-0.113	**1.000**	-0.103	0.102
F_SIZE	-0.448	0.512	-0.103	**1.000**	-0.473
M_LEV	-0.471	**0.956**	-0.148	0.524	-0.108
Q_SPRD	0.211	-0.077	0.102	-0.473	**1.000**

Source: Data Processed 2022.

As shown in table (5), the highest value in each row represents the best indicator for each construct. In light of the above values, it can be concluded that both book leverage and market leverage are appropriate indicators for measuring capital structure. Further, the modified Jones model is the appropriate indicator for measuring EM, and the quoted spread is the best indicator for measuring SL. Therefore, all indicators meet the requirements.

Reliability:

Assessing internal consistency reliability is typically done using composite reliability (Jöreskog, 1971). Higher scores generally imply higher reliability levels. Scores between 0.70 and 0.90 are deemed satisfactory (Diamantopoulos et al., 2012). Although it uses the same criteria as composite reliability, Cronbach's alpha is an alternative internal reliability indicator that yields lower results (Hair et al., 2019). Table (6) shows that the indicators of both Cronbach's alpha and composite reliability are considered satisfactory, indicating a higher level of reliability.

Table (6)

The reliability values

Variables	Symbol	Reliability	
		Cronbach's Alpha	Composite Reliability
Capital structure	CS	**0.898**	**0.907**
Earnings Management	DACC_EM	1	1
Stock liquidity	S_LIQ	1	1
Firm Size	F_SIZE	1	1
Assets liquidity	ASSET_LIQ	1	1

Source: Data Processed 2022.

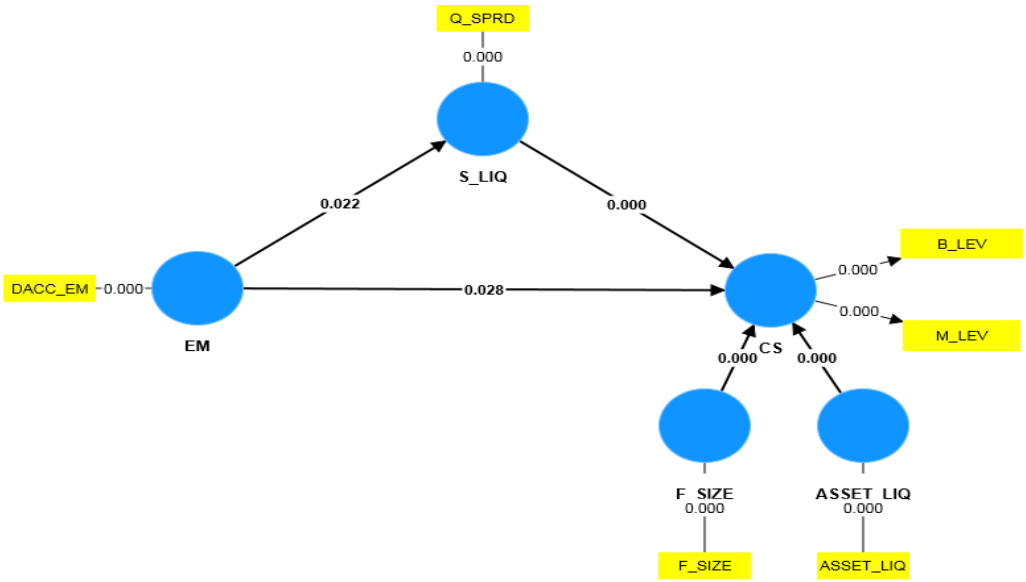
3.4.4 Hypotheses Testing and Analysis of the Results:

To verify the pre-established research hypotheses, the researcher performed path analysis for the measurement model using Smart PLS. The findings of the path analysis are presented in Table (7):

Table (7)

Path Analysis

Paths	Original sample	Sample mean	STDEV	T statistics	P values
EM -> S_LIQ	**0.102****	**0.102**	**0.045**	**2.293**	**0.022**
S_LIQ -> CS	**0.207*****	**0.208**	**0.039**	**5.318**	**0.000**
EM -> CS	**-0.068****	**-0.069**	**0.031**	**2.194**	**0.028**
F_SIZE -> CS	**0.423*****	**0.423**	**0.040**	**10.569**	**0.000**
ASSET_LIQ -> CS	**-0.348*****	**-0.349**	**0.034**	**10.293**	**0.000**
DACC_EM -> S_LIQ -> CS	**0.021****	**0.021**	**0.011**	**2.014**	**0.044**



Source: Data Processed 2022.

Figure (3): Measurement Model (Inner Model)

Testing the First Hypothesis (H1):

The first row in Table (7) shows ***a positive and significant association*** between EM and SL, as measured by quoted spread (**inverse measure of liquidity**). Therefore, it could be concluded that there is a significant negative association between EM and SL. This finding suggests that engaging in EM practices reduces SL. **This means accepting the first hypothesis, which states that "There is a significant association between EM and SL".**

The hypothesized interpretation for the finding is that firms that employ opportunistic EM methods present less information, which affects the informational environment and results in an adverse selection issue and uncertainties, either to hide poor performance or to fulfill predetermined goals or projections. As a result of the consequences of adverse selection caused by informed parties who benefit at the expense of uninformed stakeholders, the market makers (liquidity providers) will most likely increase their bid-ask prices to compensate for potential financial losses with informed investors, raising transaction costs, reducing investor trust and credibility, and reducing SL. This result is consistent with Fathi et al. (2011), Ascioglu et al. (2012), Bafghi (2014), Ajina & Habib (2017), Agustia et al. (2019), Hunjra et al. (2020) and Amawi & Nassar (2021).

Testing the Second Hypothesis (H2):

The second row in Table (7) shows a positive and significant association between SL, as measured by the quoted spread (**inverse measure**), and leverage. This result indicates that when companies' SL increases, they tend to depend more on equity to finance their activities than debt. Therefore, it could be concluded that there is a significant negative association between SL and leverage. Companies with high equity liquidity have lower leverage levels in their CS. **This means accepting the second hypothesis, which states that "There is a significant association between SL and leverage".**

The researcher justifies the findings by pointing out that when SL rises, companies tend to rely on equity to meet their financing needs due to the lower issuing cost associated with increased liquidity. This result is illustrated by the positive association between the quoted spread and leverage, where an increase in the quoted spread leads to an increase in the level of leverage due to the trade-off between the costs of the two sources of finance.

This result is consistent with the predictions of both pecking-order and trade-off theories. The pecking-order theory claims that, when companies need external financing, they rely on debt and only use equity as a last resort, indicating a negative relationship between debt and equity. Further, the trade-off between the cost of equity and the cost of debt determines to a greater extent which source will be used. This result is consistent with Leelakasemsant (2014), Rashid & Mehmood (2017), Nadarajah et al. (2018), Hanselaar et al. (2019), Dang et al. (2019), and Chen et al. (2020).

Testing the Third Hypothesis (H3):

The third row in Table (7) reveals a negative and significant association between EM and leverage. **This means accepting the third hypothesis, which states that "There is a significant association between EM and leverage".**

When companies practice opportunistic EM activities, this leads to a decrease in the leverage level in the CS. This negative relationship stems from the fact that when companies practice opportunistic EM, the information asymmetry problem arises, affecting the information environment and creating uncertainty about future cash flows, which in turn affects the risks associated with the companies. Therefore, the negative relationship between EM and leverage can be justified as follows:

- The creditors, as opposed to market makers, are described as risk-averse and will assume high risks associated with the increased uncertainty; as a result, they will either refuse to provide debt capital or impose a higher risk premium to be reflected in the cost of debt or impose more severe restrictions such as asking for more information for risk rating, tightening the loan agreement, close credit monitoring, and taking adequate collateral, hence reducing the debt ratio in CS.
- Excessive information asymmetry could be a result of managerial actions that increase uncertainty and lower credit quality from independent rating agencies (Wittenberg-Moerman, 2008). Therefore, the leverage level will be reduced over time since no or less finance can be taken from banks.
- Information asymmetry also causes adverse selection and firm stock illiquidity and lowers business creditworthiness (Copeland & Galai, 1983), which ultimately lowers the potential to borrow funds and supply debt financing, especially in bank-based economies.

Furthermore, the difference between the equity-capital providers and the debt-capital providers (banks) lies in the risk-acceptance attitude. The market-makers, who are described as risk-takers, will accept providing the financing after expanding their spread, while the banks either refuse to provide it or reflect the increased risk in the cost of debt. This justifies the negative relationship between EM and leverage in Egypt since the existing debt will be retired when due, accompanied by difficulty in obtaining additional debt. Furthermore, given the dominance of bank financing in Egypt, it is reasonable to conclude that information asymmetry has an impact on both SL and credit ratings. As a result, companies will trade off the costs of the two sources, taking into consideration the risk-taking attitude of capital providers and the dominance of each source of finance in the economy. This result is consistent with Orazalin & Akhmetzhanov (2019); Shoaib & Siddiqui (2020); Gregova et al. (2021); and Beiruth et al. (2021).

Testing the Fourth Hypothesis (H4):

The sixth row in Table (7) shows that there is a significant positive indirect association between EM and CS through SL. This result indicates that engagement in opportunistic EM practices leads to an increase (or decrease) in stock illiquidity (stock liquidity), which in turn increases (or decreases) the use of leverage in the CS of the sample companies. **This means accepting the fourth hypothesis, which states that "There is an indirect association between EM and CS through SL as a mediator".**

There is no study to date addressing the hypothesized path of the indirect impact of EM on CS through SL as a mediator. The findings show that there is a significant positive indirect association between EM and CS through SL. This result stems from the notion that firms applying opportunistic EM have lower SL, and lower SL is associated with a higher leverage level, as illustrated above. Therefore, SL acts as a mediator in the association between EM and leverage. Both the direct and indirect impacts of EM on CS (leverage) are significant and point in the opposite direction. Therefore, it can be concluded that the mediating role of SL in the relationship between EM and CS is considered competitive mediation.

4. Conclusion:

This research provides empirical evidence that enriches the accounting and finance literature regarding the impact of EM on SL, the impact of SL on CS, the direct impact of EM on CS, and finally the indirect impact of EM on CS through SL as a mediator. The main conclusions derived from this study are as follows:

First, there is a significant negative relationship between EM and SL, implying that companies practicing opportunistic EM have a higher bid-ask spread than other companies. Further, companies practicing opportunistic EM disclose less information, affecting the information environment and resulting in an adverse selection problem and uncertainty. This result supports the idea that the quality of the information disclosed affects the liquidity of the securities in the Egyptian context. This must motivate managers to consider disclosure as a method of mitigating illiquidity risk and to better analyze securities market prices.

Second, the relationship between SL and CS is significantly negative. Both pecking-order and trade-off theories support the idea that companies with liquid shares tend to use equity over debt when they need financing. This result, however, is especially interesting since this research examines companies in Egypt, where the financial environment and institutional features are substantially different from those in the U.S. and other developed countries.

Third, there is a significant negative relationship between EM and CS. This inverse association results from the information asymmetry problem that occurs when companies use opportunistic EM. This problem affects the information environment and raises uncertainty about future cash flows, which in turn increases the risks related to the companies. Therefore, debt

providers will either refuse to provide debt capital or impose a higher risk premium to be reflected in the cost of debt or impose more severe restrictions, resulting in less leveraged capital structures.

Finally, through SL as a mediator, EM has a significant positive indirect relationship with CS. This result stems from the notion that companies applying opportunistic EM have lower SL, and lower SL is associated with a higher leverage level. Therefore, SL acts as a mediator in the relationship between EM and CS, as proxied by leverage.

5. Limitations and Directions for Future Research:

It is important to be cautious when interpreting research inferences, considering the limitations of the research. These limitations are summarized as follows:

1. The financial sector, including banks, was excluded from the sample because their financial reporting environments differed from those of non-financial companies, resulting in fundamentally distinct accrual activities that are unlikely to be adequately captured by models of ordinary accrual activities.
2. Firms that had balance sheet dates other than December 31 were excluded from the sample.
3. The current study does not take into account real EM and earnings smoothing activities.

Considering the findings, the researcher believes that many areas could form the basis for future research. The researcher recommends incorporating more factors into the analysis of CS, such as financial reporting quality, and other EM tools such as real EM and earnings smoothing. In addition, examining the impact of discretionary EM on SL using data from the Egyptian banking sector.

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Ahmed Saad Hassan Saad; Dr. Walid Shehata Soliman

and Dr. Kholoud Abdelkarim Hussein

دراسة تأثير إدارة الأرباح على سيولة السهم وتأثيرها على هيكل رأس المال : دليل من مصر

المستخلص

ناقشت العديد من الدراسات السابقة تحليل أثر هيكل رأس المال على قيمة المنشأة وتكلفة رأس المال. هذا، وقد أشارت نظريات هيكل رأس المال التقليدية إلى العديد من محددات القرارات ذات الصلة بهيكل رأس المال بمنشآت الأعمال، كحجم المنشأة وفرص النمو المتوقعة ومعدلات الربحية المحققة، وتعتبر إدارة الأرباح وسيولة الأسهم من المحددات الأخرى المحتملة لهيكل رأس المال. من هذا المنظور، يهدف هذا البحث إلى الإجابة على الأسئلة البحثية التالية: (١) هل تؤثر إدارة الأرباح على سيولة الأسهم لمنشآت الأعمال المدرجة بالبورصة ؟ (٢) هل تؤثر سيولة الأسهم على هيكل رأس المال لمنشآت الأعمال المدرجة بالبورصة ؟ (٣) هل تؤثر إدارة الأرباح بشكل مباشر على هيكل رأس المال لمنشآت الأعمال المدرجة بالبورصة ؟ (٤) هل تلعب سيولة الأسهم دوراً وسيطاً في تفسير طبيعة العلاقة المحتملة بين إدارة الأرباح وهيكل رأس المال لمنشآت الأعمال المدرجة بالبورصة ؟ وبذلك، فإن هذا البحث يستهدف (١) دراسة تأثير إدارة الأرباح على سيولة الأسهـم، (٢) دراسة تأثير سيولة الأسهم على هيكل رأس المال، (٣) دراسة تأثير إدارة الأرباح على هيكل رأس المال، و (٤) دراسة التأثير غير المباشر لإدارة الأرباح على هيكل رأس المال من خلال تأثيرها المحتمل على سيولة الأسهم. وسعياً نحو تحقيق أهداف البحث، فقد شملت عينة الدراسة ٩٤ منشأة أعمال غير مالية مدرجة بالبورصة المصرية خلال الفترة من ٢٠١٥ إلى ٢٠٢١. هذا، وقد أشارت نتائج الدراسة إلى وجود علاقة سلبية ذات دلالة إحصائية بين إدارة الأرباح وسيولة الأسهم، ووجود علاقة سلبية ذات دلالة إحصائية بين سيولة الأسهم وهيكل رأس المال، ووجود علاقة مباشرة سلبية ذات دلالة إحصائية بين إدارة الأرباح وهيكل رأس المال. أخيرًا، وثقت نتائج الدراسة وجود علاقة غير مباشرة إيجابية ذات دلالة إحصائية بين إدارة الأرباح وهيكل رأس المال من خلال سيولة الأسهم، وهو ما يشير إلى الأثر الوسيط الذي تلعبه سيولة الأسهم في تفسير طبيعة العلاقة القائمة بين إدارة الأرباح وهيكل رأس المال.

كلمات الفهرسة: إدارة الارباح، سيولة الأسهم، هيكل رأس المال، مصر.