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Dr. Hossam Hassan Mahmoud Sharawi[1]

Jeddah International College (JIC); Higher Institute of Computer King Marriott

How Does Capital Structure Moderate the Relationship Between Dividend Policy and Firm Performance in Egypt?

Abstract

This study examines how dividend policy and capital structure affect non-financial firms' performance (operational, financial, and market) listed on the EGX. The data were collected from 68 firms in different sectors from 2014 to 2022 over nine years. The findings indicate that the impact of dividend policy on firm performance depends on the firm's capital structure. For firms with higher debt-to-equity ratios, paying higher dividends per share can be beneficial as it signals their financial strength and reduces agency costs. However, for firms with lower debt-to-equity ratios, paying higher dividends per share can reduce their profitability and return on equity. The study's findings have implications for stakeholders in the Egyptian stock market. Managers of firms with higher debt-to-equity ratios may want to consider increasing their dividend payouts to signal their financial strength and reduce agency costs. Investors should consider investing in firms with higher dividend payouts, as these firms are more financially stable and have lower agency costs.

Keywords: dividend policy, capital structure, firm performance, Egypt.

Email: h. Sharawi@ Jicollege.edu.sa
hosamahassan9999@yahoo.com

كيف يُعدل هيكل رأس المال العلاقة بين سياسة توزيع الأرباح وأداء الشركات في مصر؟

ملخص البحث

تركز الدراسة الحالية على كيفية تأثير سياسة توزيع الأرباح وهيكل رأس المال على الأداء المالي للشركات غير المالية المدرجة بالبورصة المصرية. وقد اعتمد الباحث على عينة مكونة من 68 شركة تمثل 612 مشاهدة من قطاعات مختلفة لفترة تسع سنوات (2014-2022). وتُشير نتائج الدراسة إلى أن تأثير سياسة توزيع الأرباح على أداء الشركة يعتمد على هيكل رأس مال الشركة. بالنسبة للشركات التي لديها نسب أعلى للديون إلى حقوق الملكية، يمكن أن تكون التوزيعات المرتفعة للأرباح مفيدة لأنها تعطي إشارة على جدارتها المالية وتقلل من تكاليف الوكالة. ومع ذلك بالنسبة للشركات ذات النسب المنخفضة للديون بالمقارنة بحقوق الملاك فإن التوزيعات المرتفعة للأرباح يمكن أن تقلل من كل من العائد على الأصول والعائد على حقوق الملكية. وتُعتبر نتائج هذه الدراسة ذات تأثير على المديرين والمستثمرين في البورصة المصرية. فقد يرغب مديرو الشركات التي لديها نسب ديون مرتفعة في التفكير في زيادة توزيعات الأرباح للإشارة إلى السلامة المالية للشركة وتقليل تكاليف الوكالة. وقد يرغب المستثمرون في التفكير في الاستثمار في شركات ذات توزيعات أرباح أعلى، حيث قد تكون هذه الشركات أكثر استقرارًا من الناحية المالية ولديها تكاليف وكالة أقل.

الكلمات المفتاحية: سياسة توزيع الأرباح، هيكل رأس المال، أداء الشركات، مصر

1. Introduction

Firm performance depends on various factors, including financing decisions, dividend policy, and capital structure. Dividend policy is the choice of how much of the firm's earnings to pay out to shareholders as dividends. Equally important is the capital structure, a combination of debt and equity used to finance the company's activities. The relationship between dividend policy, capital structure, and firm performance has been debated in accounting and corporate finance literature. Some theories, such as the dividend irrelevance theory (Modigliani & Miller, 1961), suggest that these decisions do not affect the firm's value as long as the firm invests in optimal projects. Other theories, such as the signaling theory (Bhattacharya, 1979), suggest that these decisions convey information to the market and affect the firm's performance. Empirical studies have also provided mixed evidence on the impact of dividend payout and capital structure on firm performance. For example, DeAngelo (2022) found that dividend policy did not affect firm performance. Liviani and Rachman (2021) found a positive effect of dividend policy on firm performance with a moderating effect on leverage and sales growth.

The literature review shows the impact of dividend policy and capital structure on firm performance as an essential topic studied in different countries and contexts. However, there is a need for more consensus on the direction and magnitude of this effect, as different studies have reported different results. For example, some studies have found a positive effect of dividend decisions and capital structure on firm performance (e.g., Rehman, 2016; Sari et al., 2022), while others have found a negative effect (e.g., Shah et al., 2018). Some studies have also found that these variables have mixed or insignificant effects on firm performance (e.g., Nugraha et al., 2020; DeAngelo, 2022). Moreover, some studies have suggested that the effect of dividend payout and capital structure on firm performance may depend on various factors, such as firm size, growth,

profitability, risk, industry, ownership structure, corporate governance, tax regime, market conditions, institutional environment and legal system (e.g., Miller & Modigliani, 1961; Jensen & Meckling, 1976; Fama & French, 2002; Wardani et al., 2022; Al Momani et al., 2022).

In addition to these studies, other sources provide relevant insights on this topic. For instance, Maina and Jagongo (2022) provide a comprehensive overview of the theories and models of capital structure and dividend policy and their implications for firm performance. They also discuss the pre-Modigliani and Miller (MM) world and their contributions to corporate finance. Another study by Yusup et al. (2022) explores how different investment, funding, and dividend policies can impact the value of a company. They find that all these factors significantly impact firm performance and suggest some recommendations for managers and investors. Furthermore, Lee (2022) finds that capital structure, investment, dividends, and firm performance significantly affect each other, and management overconfidence moderates the effect of capital structure on investment and dividends. They find that dividend changes are positively related to capital structure changes, and they contend that this fits with the idea that value-maximizing corporations pursue optimal dividend and capital structure strategies.

The relationship between dividend policy, capital structure, and firm performance has been studied extensively in accounting and finance. However, most existing studies focus on developed markets, such as the US and UK, and assume that these markets are efficient and frictionless. In contrast, emerging markets, such as Egypt, have different characteristics, such as market imperfections, institutional factors, political instability, and cultural differences, that may affect how dividend choices and the firm's capital structure affect its performance. Therefore, there is a need for more empirical research on this topic

in the Egyptian context. As a result, this study will address the following questions:

1. How does dividend policy impact firm performance in Egypt?

2: How does capital structure impact firm performance in Egypt?

3: How does capital structure moderate the relationship between dividend policy and firm performance?

Thus, this study will fill the knowledge gap by analyzing the relationship between dividend policy, capital structure, and firm performance in financial Egyptian firms through 2014 – 2022. Thus, the study's objectives are to:

1. Review the theories and previous studies on the influence of dividend payout and capital structure on firm performance.
2. Examine the dividend policy and capital structure's empirical effects on Egyptian firms' performance.
3. Examine how capital structure affects the association between dividend payouts and firm performance.

This study has several practical, professional, and academic implications. **Firstly**, it can help Egyptian firms optimize their dividend policy and capital structure decisions and enhance their performance. **Secondly**, it can provide valuable information for investors who want to invest in Egyptian firms, which can improve their investment outcomes. **Thirdly**, It can add to the extant knowledge on dividend policy and capital structure, enriching knowledge and understanding of these topics. Following this structure, the rest of this study will be presented. Section 2 will review the critical theories connected to the research issue. Section 3 will outline the study's research design, methodologies, and data sources. Section 4 will provide and discuss the conclusions of the data analysis.

Section 5 will summarize the study's main contributions, shortcomings, and implications for future research.

2- Related literature and hypotheses development

The literature on dividend policy, capital structure, and firm performance is vast. To explain the relationship between these characteristics and company success, some critical ideas have been proposed.

2-1 Dividend policy theories

The theories differ in market assumptions and dividend policy's effect on corporate value.

1- **The irrelevance theory** (**Modigliani & Miller**, **1961**) requires perfect markets, no taxes, transaction costs, and information symmetry. Under these assumptions, dividend policy does not alter firm value.

2- **The bird in hand theory** (Bhattacharya, 1979) relaxes some of the assumptions of the irrelevance theory. It assumes that markets are imperfect, there are taxes, there are transaction costs, and there is information asymmetry. Under these assumptions, dividend policy can affect firm value. Shareholders prefer dividends over capital gains, so a firm that pays dividends can attract a higher shareholder valuation.

3- **The signaling theory** (Bhattacharya, 1979) also relaxes some of the assumptions of the irrelevance theory. It assumes that markets are imperfect, there are taxes, there are transaction costs, and there is information asymmetry. Under these assumptions, dividend policy can tell the market about a firm's future. A company that pays dividends shows confidence in its future, increasing shareholder value.

4- **The agency theory** (Jensen & Meckling, 1976) also relaxes some of the assumptions of the irrelevance theory. It assumes that markets are imperfect, there are taxes, there are transaction costs, and there is information asymmetry. Under these assumptions, dividend policy can reduce agency costs between managers and shareholders. Dividends can incentivize managers to act in the best interests of shareholders, as they will be rewarded with higher dividends if the firm performs well.

5- **The dividend stabilization policy** (Lintner, 1956) and **dividend smoothing policy** (Gordon, 1959) are not theories of dividend policy per se, but instead, they are guidelines for how firms should set their dividend policy. The dividend stabilization policy suggests that firms should stabilize their dividend payments over time, even if it means paying out less than they could in some years. The dividend smoothing policy suggests that firms should smooth their dividend payments over time by paying a relatively constant amount each year. Table 1 presents the above theories.

Table 1: **Dividend policy theories**

Theory	Date	Studies	Assumptions	Implications
Dividend stabilization policy	1956	Lintner	Imperfect markets, taxes, transaction costs, and information asymmetry	Firms should stabilize their dividend payments over time, even if it means paying out less than they could in some years.
Dividend smoothing policy	1959	Gordon	Imperfect markets, taxes, transaction costs, and information asymmetry	Firms should smooth their dividend payments over time by paying a relatively constant amount each year.

Theory	Date	Studies	Assumptions	Implications
Irrelevance theory	1961	Modigliani and Miller	Perfect markets, no taxes, no transaction costs, and information symmetry	Dividend payouts do not impact corporate value.
Agency theory	1976	Jensen and Meckling	Imperfect markets, taxes, transaction costs, and information asymmetry	Agency costs between management and shareholders can be minimized with a dividend policy.
Bird-in-the-hand theory	1979	Bhattacharya	Imperfect markets, taxes, transaction costs, and information asymmetry	Dividend policy affects firm value. Shareholders prefer dividends over capital gains.
Signaling theory	1979	Bhattacharya	Imperfect markets, taxes, transaction costs, and information asymmetry	A dividend policy conveys market information about a firm's prospects.

2.2 The Relation Between Dividend Policy and Firm Performance

Managers have to make many important choices, and the dividend policy is one of the most important. It affects how earnings are shared with shareholders and how the firm pays for its investments. The effect of payout policy on how well a company does has been studied extensively, but the results do not need to be clarified and often contradict each other. Most research discovered a positive association between dividend policy and firm performance, implying that firms with a larger dividend payment ratio are likely to perform better. It is consistent

with the premise that investors favor dividends that provide a regular revenue source. (Morovvati and Pouralim2015; Bezawada & Tati, 2017; Amollo, 2016; Fajaria & Isnalita, 2018; Monoarfa, 2018; Adiputra & Hermawan, 2020; Endang et al., 2020; Hansda et al., 2020; Husain & Sunardi, 2020; Aprilyani et al., 2021; Kusumawati & Harijonom, 2021; Liviani & Rachman, 2021; Abdullah et al., 2023; Hanafi et al., 2023; Mahirun et al., 2023). However, a few studies found insignificant or adverse effects of dividend policy on firm performance (Modigliani & Miller, 1961). However, dividend policy's effect on a company's bottom line may vary depending on external factors like the nature of the business, its financial health, and the rules and regulations it operates (Purta et al., 2022; Salju et al., 2022).

In Egypt, there needs to be more studies done on how dividend policy affects how well a company does. However, the results of previous studies show that there may be a positive relationship between Egypt's dividend policy and firm performance. In Egypt, where inflation is high, investors like to get dividends because they give them a steady income. Based on what these studies have found, the hypothesis that follows can be made:

H1: **Dividend policy is positively associated with firm performance**.

2.3 Capital Structure Theories

Theories about capital structure look at the best mix of debt and stock that helps a company pay for its operations and investments. Different theories have different ideas about the relationship between capital structure and company performance and what that means. Table 2 shows how the main capital structure ideas compare to each other:

Table 2: Capital Structure Theories

Theory	Study	Assumptions	Implications
Modigliani–Miller (MM) theorem	Modigliani–Miller, (1958)	Perfect capital markets, no taxes, no bankruptcy costs, and homogeneous expectations	The capital structure of a company has no bearing on its value. The weighted average cost of capital (WACC) for a company whose equity cost is not known is always the same.
Pecking order theory	Frank& Goyal, (2003)	Challenges the notion of an optimal capital structure and proposes that firms follow a hierarchical order of financing sources based on their information asymmetry and signaling effects	Companies will instead use capital from within rather than seek it elsewhere. Companies often choose debt over equity when they need more money. When all else fails, turn to equity.
Trade-off theory	Hackbarth, et al., (2007)	It relaxes some of the MM theorem assumptions and introduces the effects of taxes and bankruptcy costs on capital structure decisions.	The optimal capital structure maximizes the firm's value by weighing the pros and cons of debt financing. The weighted average cost of capital (WACC) shifts as a company adjusts its financing mix to take advantage of opportunities in the debt and equity markets.
Market timing theory	Arosa et al., 2014	Suggests that firms time their financing decisions based on the market conditions and their relative valuation	There is no optimal capital structure but a dynamic leverage adjustment based on market opportunities.

2.4 The Relation Between Capital Structure and Firm Performance

Companies with a larger debt-to-equity ratio have been shown to perform better in most research, suggesting a favorable association between capital structure and firm performance. As long as the advantages of the tax shelter outweigh the disadvantages of financial difficulty, the trade-off theory predicts that enterprises can raise their value by employing debt financing. (Ahmed et al., 2023; Akinrinola et al., 2023; Akmalia, 2023; Ali et al., 2022; Almomani et al., 2022; Hussein, 2020; Irawan et al.,2022; Kim et al., 2023; Maina & Jagongo, 2022; Maneerattanarungrot & Donkwa, 2018; Mills & Mwasambili, 2022; Ngoc et al., 2021; Oktrima & Sutrisno,2023; Olusola et al., 2022). However, a few studies found insignificant or adverse effects of capital structure on firm performance (Pandey & Sahu, 2023; Sakr & Bedeir, 2020). Capital structure's effect on a company's bottom line varies according to several variables, including the business's nature, capital availability, and the regulatory environment (Tabe, 2022; Tangngisalu et al., 2023).

On the other hand, taxes, bankruptcy costs, agency costs, and asymmetric knowledge all impact company performance and capital structure. While taxes mitigate the actual cost of debt by acting as a tax shelter, the legal and financial repercussions of filing for bankruptcy increase this cost. Managers, stockholders, and creditors all having competing interests can lead to agency costs that reduce firm performance and increase the cost of debt. When certain parties have access to more or better knowledge than others, it can lead to issues with adverse selection and moral hazard when attracting outside funding (Hussein, 2020; Irawan et al.,2022; Kim et al.,2023).

Egypt's academics and business people are interested in how a company's capital structure affects its success. The best capital structure maximizes the company's worth, keeping its capital cost to a minimum. However, finding the

best capital structure is challenging because it depends on the firm's revenue, growth prospects, tax rate, risk of going bankrupt, and market conditions. More study needs to be done in Egypt to determine how capital structure affects a business's performance. However, the results show that there may be a positive relationship between capital structure and firm performance in Egypt. It is because it is known that Egyptian companies have more debt than companies in other countries.

Based on the findings of the above studies in the table, the following hypothesis can be developed for Egypt:

H2: **Capital structure is positively associated with firm performance**.

2.5 Dividend policy and firm performance: the moderating effect of capital structure

The majority of studies discovered a relationship between dividend policy and firm performance. It is consistent with the signaling theory, which suggests that firms that pay dividends convey to investors that they are profitable and have bright prospects (Marjohan, 2022; Nurdiansari et al., 2022; Prianda et al., 2022). Several studies, however, found either no relationship or a negative relationship between dividend policy and firm performance (Modigliani & Miller, 1961). On the other hand, the effect of dividend policy on firm performance may depend on other variables, such as a firm's capital structure. Several studies have found, for instance, that the positive relationship between dividend policy and firm performance is crucial for corporations with a high debt-to-equity ratio. This is because firms with a higher debt-to-equity ratio are more likely to face dividend pressure from debtholders (Monoarfa, 2018; Nurdiansari et al., 2022; Purnamasari & Fauziah, 2022). According to several studies, the positive relationship between dividend policy and firm performance is crucial for firms with a rapid growth rate. It is because firms with a higher growth rate are more likely to need to raise external finance, and paying dividends can help to signal to

investors that the firm is profitable and has good prospects for the future (Munawar,2019; Obaidat, 2018; Onyango et al., 2023; Putra et al., 2022; Rahmawati & Garad,2023; Sakr & Bedeir,2020; Sari et al., 2022; Soewarno et al., 2017; Tayachi et al., 2023).

Moreover, dividend policy, debt policy, free cash flow, and leverage are important determinants of firm performance in different industries. Additionally, some studies have confirmed that capital structure moderates the impact of dividend policy on firm performance (Skr & Bedeir, 2020; Rahmawati et al., 2020; Wardani et al.,2022). It means that the effect of dividend policy and profitability on firm performance depends on the level of capital structure. For example, a high capital structure may enhance the positive effect of dividend policy on profitability and firm value, while a low capital structure may weaken it. These results suggest that capital structure and dividend policy are interrelated and have significant implications for firm performance.

On the other hand, a firm's capital structure affects its cost of capital. Firms with a higher debt-to-equity ratio have a higher cost of capital, making it more expensive to raise new capital. It can lead to a weaker positive relationship between dividend policy and firm performance, as firms may be less likely to pay dividends if they need to conserve cash to reduce their debt levels. Based on the above, the researcher can develop the following hypothesis:

H3: **A firm's capital structure moderates the dividend policy–performance association**.

3. Research Methodology

3.1 Research Design

The study used a sample of firms listed on the Egyptian Stock Exchange database, which offers comprehensive data for each company. This study investigates the era of economic recovery from 2014 to 2022, aligning with Egypt's most recent economic developments. The researcher chose this period because it covers the aftermath of the 2011 Egyptian revolution and the subsequent political and social turmoil that affected the country's economy. The current study investigates how firms recovered from the shocks and challenges of this period and how they adapted to the changing market conditions. The study also tries to compare the performance of different sectors and industries during this period and identify the factors that influenced their recovery.

Financial firms, such as banks and insurance companies, are excluded from the study due to their distinct characteristics and regulatory frameworks that differ from those of non-financial organizations. The study incorporates a selection criterion that excludes companies with incomplete or missing data, including those with negative equity or zero sales. The ultimate sample consists of 68 non-financial companies spanning 16 industries, resulting in 612 firm-year observations. The distribution of the sample by sector and year is presented in Table 3.

The table shows that the most common sectors for non-financial firms in Egypt are Basic Resources, Food, Beverages and Tobacco, Health Care, and pharmaceuticals. These three sectors account for over 45% of the sample. Other sectors with many firms include Industrial Goods, Services and Automobiles, IT, Media and Communication Services, Real Estate, and Travel and leisure. The

table also shows that the number of firms in each sector has varied. For example, the number of firms in the Basic Resources sector has increased by over 50% since 2014. This is likely because of the increasing demand for natural resources in Egypt. The number of firms in the Health Care and pharmaceuticals sector has also increased significantly, reflecting the growing importance of the healthcare industry in Egypt.

Table 3: Distribution of sample

Sector	Firm	Obs	percent
Basic Resources	7	63	9.76%
Food, Beverages, and Tobacco	9	81	17.07%
Health Care & Pharmaceuticals	9	81	14.63%
Industrial Goods, Services, and Automobiles	5	45	4.88%
IT, Media & Communication Services	4	36	4.88%
Real Estate	8	72	14.63%
Travel & Leisure	6	54	7.32%
Utilities	1	9	1.22%
Energy & Support Services	2	18	1.22%
Trade & Distributors	2	18	2.44%
Shipping & Transportation Services	2	18	2.44%
Education Services	2	18	2.44%
Contracting & Construction Engineering	3	27	4.88%
Textile & Durables	3	27	3.66%
Building Materials	3	27	6.10%
Paper & Packaging	2	18	2.44%
Total	**68**	**612**	**100%**

3.2 Measurement of variables

The variables utilized in the present study to examine the association between dividend policy, capital structure, and business performance are presented in Table 4. The variables under consideration in this study are Tobin's Q, return on assets (ROA), and return on equity (ROE). These variables indicate the firm's overall value, profitability, and return on equity, respectively. The independent variables are DPS (dividend per share), DP (dividend payouts), LEV(leverage), and D/E(debit/equity). At the same time, size and liquidity are control variables. The supporting literature column shows the studies that have used these variables in previous research. It helps to establish the validity of the variables and the likely direction of the relationships between them. For example, previous research found that dividend policy positively relates to firm performance (e.g., Abdullah et al., 2023; Mahirum et al., 2023). It means that firms that pay higher dividends tend to have higher valuations. The table includes proxies for dividend policy, capital structure, and firm performance. The proxies for dividend policy are DPS and DP. DPS measures the dividend paid to shareholders per share, while DP measures the percentage of earnings paid to shareholders. The proxies for capital structure are LEV and D/E. LEV measures the total amount of debt a firm has relative to its assets, while D/E measures the amount of debt a firm has relative to its equity. Tobin's Q, ROA, and ROE are all ways to measure how well a company is doing. Tobin's Q measures the general value of the company, ROA measures how profitable the company is, and ROE measures the company's return on equity.

Table 4: Measurement variables

Variable	Measurement	Supporting literature
Dependent variables		
Tobin's Q	It is calculated as the market value of equity plus the book value of debt divided by the book value of assets.	(Endang et al., 2021; Hanafi et al., 2023)
ROA	The return on assets is calculated by dividing the company's profit after taxes and unusual items by the total assets.	(Husain and Sunardi, 2020; Monoarfa, 2018)
ROE	The return on equity is calculated by dividing the company's profit after taxes and unusual items by the total equity.	Husain and Sunardi, 2020; Monoarfa, 2018)
Independent variables		
DPS	DPS is determined by dividing the total dividends paid by the firm during a given period by the number of outstanding shares.	(Purta et al., 2022; Putri and Rachmawati, 2017)
DP	The dividend payout is calculated as a dividend divided by earnings per share.	(Purta et al., 2022; Putri and Rachmawati, 2017)
LEV	Total liabilities divided by total assets equals leverage.	(Salju et al., 2022; Sari et al., 2022)
D/E	Debt /Equity is calculated as total liabilities divided by total equity	(Salju et al., 2022; Sari et al., 2022)
Control variables		
Size	The natural log of the company's entire assets.	(Wardani et al., 2022; Purwani and Fitriyani, 2023)
Liquidity	Liquidity is calculated by dividing cash and cash equivalents by total assets.	Wardani et al., 2022; Purwani and Fitriyani, 2023)

3.3 Regression Models

The models used to test the study's hypotheses are presented in the following table. This study delves into how dividend policy and capital structure affect firm performance and how capital structure acts as a moderator between the two. The research employs Tobin's Q, return on Assets, and Return on Equity to evaluate

firm performance. Dividend payout ratio (DPS) and dividend yield (DP) are also included in the research. The study uses two measures of capital structure: Lev and DE. The study controls for liquidity and size as potential confounding factors. The table shows the regression equations for each model and each dependent variable.

The first model tests H1, which states that dividend policy positively impacts firm performance. The model includes DPS and DP as independent variables and liquidity and size as control variables. The model is estimated for each measure of firm performance separately.

The second model tests H2, which states that capital structure positively impacts firm performance. The model includes Lev and DE as independent variables and liquidity and size as control variables. The model is estimated for each measure of firm performance separately.

The third model tests H3, which states that capital structure moderates the relation between dividend policy and firm performance. The model includes DPS, DP, Lev, DE, and DPS*DE as independent variables and liquidity and size as control variables. The model is estimated for each measure of firm performance separately.

The table defines the following symbols:

$\beta 0$- $\beta 7$ = Regression coefficients

ε = Error term

Table 5: Research Models

The first model to examine H1 (The Effect of Dividend Policy on Firm Performance)
The first model is divided into three parts to measure the dependent variable 1- Tobin's Q=β0+β1 DPS +β2 DP + β3 liquidity +β4 Size +ε 2- ROA=β0+β1 DPS +β2 DP + β3 liquidity +β4 Size +ε 3- ROE=β0+β1 DPS +β2 DP + β3 liquidity +β4 Size +ε
The second model to examine H2 (The Effect of Capital Structure on Firm Performance).
The second model is divided into three models to measure the dependent variable. 1- Tobin's Q=β0+β1 Lev+β2 DE + β3 liquidity +β4 Size +ε 2- ROA=β0+β1 Lev+β2 DE + β3 liquidity +β4 Size +ε 3- ROE=β0+β1 Lev+β2 DE + β3 liquidity +β4 Size +ε
The final model to examine H3 (The Capital structure moderates dividend policy-firm performance).
The third model is divided into three models to measure the dependent variable 1-Tobin's Q=β0+β1 DPS +β2 DP + β3 Lev +β4 DE + β5 DPS*DE + β6 liquidity+ β7 Size+ ε 2-ROA=β0+β1 DPS +β2 DP + β3 Lev +β4 DE + β5 DPS*DE + β6 liquidity+ β7 Size+ ε 3-ROE=β0+β1 DPS +β2 DP + β3 Lev +β4 DE + β5 DPS*DE + β6 liquidity+ β7 Size+ ε β0- β7 = Regression coefficients ε = Error term

4. Empirical results

4.1 descriptive data analysis

Table 6 shows that the mean value of Tobin's Q for Egyptian firms is 1.013, which indicates that, on average, the market value of these firms is higher than their book value of assets. The mean value of ROA is 0.022, which implies that these firms have low profitability regarding their asset utilization. The mean value of ROE is 0.356, which suggests that these firms have high profitability regarding their equity investment. The mean value of DPS is 0.675, meaning that these firms pay high dividends per share to their shareholders. The mean value of DP is 0.161, which indicates that these firms retain most of their earnings for reinvestment. The mean value of LEV is 0.608, implying that these firms rely more on debt than equity to finance their operations. The mean value of DE is 1.003, which shows that these firms have a balanced capital structure between debt and equity. The mean liquidity value is 0.991, meaning these firms can meet their short-term obligations. The mean value of size is 9.110, which reflects that these firms have a moderate size in terms of their sales volume.

Table 6: Descriptive Statistics

Variables	N	Min	Max	Mean	SD
Tobin' Q	612	0.897	1.270	1.013	0.103
ROA	612	-0.073	0.095	0.022	0.051
ROE	612	-0.238	1.300	0.0356	0.527
DPS	612	0.000	0.980	0. 675	0.284
DP	612	-0.031	0.827	0.161	0.281
LEV	612	0.348	0.998	0.608	0.215
DE	612	0.270	2.253	1.003	0.683
liquidity	612	0.487	1.920	0.991	0.395
Size	612	1.760	11.300	9.110	3.526

4.2 Correlation Matrix

Table 7 shows that Tobin's Q has a strong positive correlation with size (0.445) and a strong negative correlation with ROE (-0.516). It means that larger firms tend to have higher Tobin's Q ratios, and firms with a higher return on equity tend to have lower Tobin's Q ratios. Tobin's Q is also moderately positively correlated with liquidity (0.013) and moderately negatively correlated with DPS (-0.084) and DE (0.088), but these relationships are not statistically significant at the 5% level. ROA has a strong positive correlation with DP (0.635) and a strong negative correlation with DE (-0.856). It means that firms with higher returns on assets tend to have higher dividend payouts and lower debt-to-equity ratios. ROA is also moderately positively correlated with ROE (0.209) and liquidity (0.246) and moderately negatively correlated with LEV (-0.269) and size (-0.358), all of which are statistically significant at the 5% level.

ROE has a robust negative correlation with size (-0.611) and a moderate negative correlation with DP (-0.206) and DE (-0.331), all of which are statistically significant at the 5% level. It means that smaller firms, firms with lower dividend payouts, and firms with lower debt-to-equity ratios tend to have higher returns on equity. ROE is also moderately positively correlated with LEV (0.145) and negatively correlated with DPS (-0.133), which are statistically significant at 10%. DPS has a moderate positive correlation with LEV (0.179) and liquidity (0.249), statistically significant at the 5% level. It means that firms with higher leverage and liquidity tend to pay higher dividends per share. DPS is also weakly negatively correlated with ROE (-0.133), which is statistically significant at 10%. DP has a strong negative correlation with liquidity (-0.447) and size (-0.493), which are statistically significant at the 5% level. It means firms with lower liquidity and smaller sizes tend to have higher dividend payouts. DP is also moderately negatively correlated with LEV (-0.193) and DE (-0.383), which are statistically significant at the 5% level. LEV has a moderately positive

correlation with DE (0.202) and size (0.405), statistically significant at the 5% level. It means firms with higher debt-to-equity ratios and larger sizes tend to have higher leverage ratios. DE has a strong positive correlation with size (0.511), statistically significant at the 5% level. It means that larger firms tend to have higher debt-to-equity ratios. Liquidity has a strong positive correlation with size (0.511), which is statistically significant at the 5% level. It means that larger firms tend to have higher liquidity ratios.

Table 7: Correlation Matrix

Variables	Tobin's Q	ROA	ROE	DPS	DP	LEV	DE	liquidity	Size
Tobin's Q	1								
ROA	-0.057 0.398	1							
ROE	-.516** 0.000	.209** 0.002	1						
DPS	-0.084 0.207	-0.008 0.900	-.133* 0.046	1					
DP	-0.054 0.422	.635** 0.000	-.206** 0.002	-0.031 0.647	1				
LEV	-0.020 0.761	-.269** 0.000	.145* 0.030	.179** 0.007	-.193** 0.004	1			
DE	0.088 0.189	-.856** 0.000	-.331** 0.000	-0.013 0.844	-.383** 0.000	.202** 0.002	1		
liquidity	0.013 0.840	.246** 0.000	0.087 0.191	.249** 0.000	-.447** 0.000	-.203** 0.002	-.382** 0.000	1	
Size	.445** 0.000	-.358** 0.000	-.611** 0.000	0.111 0.095	-.493** 0.000	-.157* 0.018	.405** 0.000	.511** 0.000	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

4.3 Multivariate analysis for the first hypothesis

The results in Table 8 indicate that DP has a negative and insignificant effect on Tobin's Q but a negative and significant effect on ROA and ROE. It implies that higher dividend payouts reduce the firms' profitability and return on equity but do not affect their market valuation. It is consistent with the irrelevance theory of dividend policy, which suggests that it does not affect firm performance in a perfect market. On the other hand, DPS has a positive and significant effect on all three measures of firm performance. It implies that higher dividends per share increase the firm's market valuation, profitability, and return on equity. It is consistent with the signaling theory of dividend policy, which suggests that it conveys information about the firm's prospects and earnings quality. Liquidity also has a positive and significant effect on all three measures of firm performance. It implies that higher liquidity ratios enhance the firms' market valuation, profitability, and return on equity. It is consistent with the pecking order theory of dividend policy, which suggests that firms prefer to finance their investments with internal funds rather than external financing.

Firm size has a favorable and significant effect on Tobin's Q but a negative and significant effect on ROA and ROE. It implies that larger firms have a higher market valuation but lower profitability and return on equity than smaller firms. It may reflect larger firms' economies of scale, diversification benefits, agency costs, and inefficiencies. The F-statistic shows that all three models are statistically significant at a 1% level. The adjusted R-squared shows that the models explain 27.2%, 46%, and 43.1% of the variation in Tobin's Q, ROA, and ROE, respectively. The results of this study support the previous dividend theories and studies that suggest that dividend policy impacts firm performance. Depending on the market conditions and the signaling hypothesis, the best dividend policy is the one that maximizes the firm's stock price and shareholders' wealth.

Table 8: The effect of dividend policy on firm performance

Variables	Tobin's		ROA		ROE	
	t	P–value	t	P–value	t	P–value
(Constant)	45.194	0.000	-16.350	0.000	16.899	0.000
DP	-1.639	0.103	-5.847	0.000	-4.759	0.000
DPS	2.433	0.016	27.705	0.000	16.948	0.000
liquidity	-3.122	0.002	27.046	0.000	12.604	0.000
Size	9.220	0.000	-11.676	0.000	-32.061	0.000
F. statistic	22.06		65.992		59.88	
Adj R^2	**27.2%**		**46.0%**		**43.1%**	

Figure 1 summarizes the results of a regression analysis of dividend policy and firm performance. The independent variable is dividend policy, measured by dividend payout ratio (DP) and dividend per share (DPS). The dependent variable is firm performance, proxied by Tobin's Q, return on assets (ROA), and return on equity (ROE). It indicates whether the relationship between the independent and dependent variables is significant, positive or negative, and consistent with dividends' irrelevance or signaling theory. The main finding is that dividend policy is positively associated with firm performance when measured by DPS but not when measured by DP. It suggests that investors value dividends more when they are higher per share than as a percentage of earnings. It supports the signaling theory of dividends, which states that dividends convey information about the firm's prospects. On the other hand, the irrelevance theory of dividends, which states that dividends do not affect firm performance, is rejected by the data.

Independent Variable	Dependent Variable	Significance	Sign	Conclusion	Theory
DP	Tobin's Q	Insignificant	-	Reject	Irrelevance
DP	ROA	Significant	-	Reject	Irrelevance
DP	ROE	Significant	-	Reject	Irrelevance
DPS	Tobin's Q	Significant	+	Accept	Signaling
DPS	ROA	Significant	+	Accept	Signaling
DPS	ROE	Significant	+	Accept	Signaling

Figure 1: Prepared by the researcher

4.4 Multivariate analysis for the second hypothesis

The results in Table 9 show that LEV has a positive and significant impact on Tobin's Q but a negative and insignificant effect on ROA and ROE. It is consistent with the trade-off theory of capital structure, which suggests that firms can increase their firm performance by using debt financing up to a certain point, beyond which the increased risk of bankruptcy will offset the benefits of debt financing. The results also show that DE has a negative and significant effect on all three measures of firm performance. It is consistent with the agency cost theory of capital structure, which suggests that debt financing can lead to managers taking on more risk to increase their compensation at the expense of shareholders. Liquidity has a positive and significant effect on all three measures of firm performance. It is consistent with the pecking order theory of capital

structure, which suggests that firms prefer to finance their investments with internal funds rather than external financing. Size has a positive and significant effect on Tobin's Q but a negative and significant effect on ROA and ROE. It is consistent with the size premium, which suggests that larger firms have higher market valuations than smaller firms but lower profitability and return on equity. The results of the regression are consistent with the findings of recent studies on capital structure. For example, a study by Putri and Rachmawati (2017) found that debt financing positively and significantly affects firm performance in China. Another study by Salju et al. (2022) found that liquidity positively and significantly affects firm performance. Overall, the results of the regression suggest that capital structure can have a significant effect on firm performance. However, the optimal capital structure may vary depending on the firm's specific circumstances and market conditions. Firms should carefully consider their capital structure to maximize their value and shareholders' wealth.

The F-statistic indicates that the models are statistically significant at a 1% level. The table also shows that the adjusted R^2 values are 30.83%, 49.28%, and 44.25% for Tobin's Q, ROA, and ROE models. These values suggest that the models have moderate to high explanatory power, but there may be other factors that affect firm performance that are not included in the models.

Figure 2 summarizes the regression analysis results of capital structure and firm performance. The independent variable is the leverage ratio (LEV) or the debt-to-equity ratio (DE), and the dependent variable is Tobin's Q, return on assets (ROA), or return on equity (ROE).

Table 9: The effect of capital structure on firm performance

Variables	**Tobin's Q**		**ROA**		**ROE**	
	t	P-value	t	P-value	t	P-value
(Constant)	42.716	0.000	14.354	0.000	-3.773	0.000
LEV	2.915	0.004	-2.746	0.007	0.250	0.803
DE	-9.298	0.000	-16.863	0.000	10.660	0.000
liquidity	-10.250	0.000	-3.440	0.001	17.149	0.000
Size	13.773	0.000	1.953	0.052	-22.100	0.000
F. statistic	48.60		172.307		155.02	
Adj R^2	**30.83%**		**49.28%**		**44.25%**	

The figure also indicates whether the relationship is significant, positive or negative, and consistent with the trade-off or agency cost theory of capital structure. The main finding is that capital structure positively impacts firm performance, as measured by Tobin's Q when the leverage ratio is used as the proxy for capital structure. It supports the trade-off theory, which suggests that firms use debt to take advantage of the tax shield and increase their value. However, when the debt-to-equity ratio is used as the proxy for capital structure, the relationship becomes negative, which supports the agency cost theory. It implies that high debt levels increase the conflict of interest between shareholders and creditors and reduce firm performance. It also shows that capital structure does not significantly affect ROA or ROE, regardless of the proxy used. It contradicts both theories, which predict that capital structure affects the firm's profitability. One possible explanation is that other factors influence ROA

and ROE, such as market conditions, industry characteristics, or firm-specific factors, that the regression model does not capture.

Independent Variable	Dependent Variable	Significant?	Sign	Acceptance/Rejection	Theory
LEV	Tobin's Q	Yes	+	Accept	Trade-off
LEV	ROA	No	-	Reject	Trade-off
LEV	ROE	No	-	Reject	Trade-off
DE	Tobin's Q	Yes	-	Accept	Agency Cost
DE	ROA	Yes	-	Accept	Agency Cost
DE	ROE	Yes	-	Accept	Agency Cost

Figure 2: **Prepared by the researcher**

4.5 Multivariate analysis of the third hypothesis

Table 10 shows the regression analysis results for the moderating role of capital structure on the relation between dividend policy and firm performance. The dependent variables are Tobin's Q, ROA, and ROE, which measure different aspects of firm performance. The independent variables are DP (dividend payout ratio), DPS (dividend per share), LEV (leverage ratio), DE (debt-equity ratio, and DPS*DE (interaction term between dividend per share

and debt-equity ratio). The table reports each regression model's coefficients, t-statistics, p-values, F-statistics, and adjusted R-squared.

The table indicates that dividend policy significantly impacts firm performance, but the direction and magnitude of this impact depend on the firm's capital structure. For Tobin's Q, the coefficient of DP is positive but insignificant, while the coefficient of DPS is negative and significant. It suggests that higher dividends per share reduce the firm's market value, while the dividend payout ratio has no effect. However, the coefficient of DPS*DE is positive and significant, indicating that the debt-equity ratio moderates the negative effect of DPS. In other words, firms with higher debt-equity ratios can benefit from paying higher dividends per share, which signals their financial strength and reduces agency costs.

For ROA, the coefficient of DP is negative and significant, while the coefficient of DPS is positive and significant. It implies that higher dividend payout ratios reduce the firm's profitability, while higher dividends per share increase it. The coefficient of DPS*DE is negative and significant, suggesting that the debt-equity ratio moderates the positive effect of DPS. In other words, firms with higher debt-equity ratios have lower profitability when they pay higher dividends per share, reducing their retained earnings and increasing their financial distress.

For ROE, the coefficient of DP is negative and significant, while the coefficient of DPS is positive and significant. Higher dividend payout ratios reduce the firm's return on equity, while higher dividends per share increase it. The coefficient of DPS*DE is negative and significant, indicating that the debt-equity ratio moderates the positive effect of DPS. In other words, firms with higher debt-equity ratios have lower returns on equity when they pay higher dividends per share, as this dilutes their earnings per share and increases their cost of equity.

The table also shows that other factors, such as leverage, debt-equity ratio, liquidity, and size, significantly affect firm performance. The F-statistic indicates that the models are statistically significant at the 0.01 level. On the other hand, the models for Tobin's Q, ROA, and ROE have adjusted R^2 values of 41.69%, 57.03%, and 52.69%, respectively, which are relatively high and suggest that the models have good explanatory power.

Table 10: The moderating role of Capital structure on the relation between Dividend policy and Firm performance

Variables	**Tobin's Q**		**ROA**		**ROE**	
	t	P-value	t	P-value	t	P-value
(Constant)	29.617	0.000	-1.785	0.050	3.878	0.001
DP	0.451	0.455	-4.304	0.000	-5.657	0.000
DPS	-3.643	0.000	16.233	0.000	9.120	0.000
LEV	1.617	0.087	1.327	0.218	-0.930	0.543
DE	-9.322	0.000	-7.507	0.000	5.430	0.000
Liquidity	-9.554	0.000	8.218	0.000	10.240	0.000
Size	14.027	0.000	-2.707	0.025	-25.547	0.000
DPS*DE	4.567	0.000	-5.455	0.001	-9.342	0.000
F. statistic	40.73		315.518		230.68	
Adj R2	**41.69%**		**57.03%**		**52.69%**	

Figure 3 summarizes the interaction effect of dividend policy and capital structure on firm performance. The sign of the coefficient for DP is negative for all three measures of firm performance. Figure 3 suggests that higher dividend payouts (DP) reduce firm performance. The sign of the coefficient for DPS is positive for all three measures of firm performance. It suggests that higher dividends per share (DPS) increase firm performance. The sign of the coefficient for LEV is positive for Tobin's Q and negative for ROA and ROE. It suggests that higher levels of debt financing (LEV) can increase the firm's performance up

to a certain point, beyond which the increased risk of bankruptcy will offset the benefits of debt financing. The sign of the coefficient for DE is negative for all three measures of firm performance. It suggests that higher debt-to-equity (DE) ratios can lead to managers taking on more risk to increase their compensation at the expense of shareholders. The sign of the coefficient for liquidity is positive for all three measures of firm performance. Higher liquidity ratios can increase firm performance by reducing the cost of capital and making it easier for firms to raise financing when needed. The sign of the coefficient for size is positive for Tobin's Q and negative for ROA and ROE. It suggests that larger firms have higher market valuations than smaller firms but lower profitability and return on equity. The acceptance/rejection column shows whether the results of the study support or reject the expected hypothesis for each independent variable. The results support the dividend irrelevance theory, the signaling theory, the agency cost theory of capital structure, and the pecking order theory of capital structure.

Independent Variable	Dependent Variable	Significant?	Sign	Acceptance/Rejection	Theory
DP	Tobin's Q	Yes	-	Accept	Irrelevance
DP	ROA	Yes	-	Accept	Irrelevance
DP	ROE	Yes	-	Accept	Irrelevance
DPS	Tobin's Q	Yes	+	Accept	Signaling
DPS	ROA	Yes	+	Accept	Signaling
DPS	ROE	Yes	+	Accept	Signaling
LEV	Tobin's Q	Yes	+	Accept	Trade-off
LEV	ROA	No	-	Reject	Trade-off
LEV	ROE	No	-	Reject	Trade-off
DE	Tobin's Q	Yes	-	Accept	Agency Cost
DE	ROA	Yes	-	Accept	Agency Cost
DE	ROE	Yes	-	Accept	Agency Cost

Independent Variable	Dependent Variable	Significant?	Sign	Acceptance/Rejection	Theory
Liquidity	Tobin's Q	Yes	+	Accept	Pecking Order
Liquidity	ROA	Yes	+	Accept	Pecking Order
Liquidity	ROE	Yes	+	Accept	Pecking Order

Figure 3: **Prepared by the researcher**

The effect of dividend policy on firm performance depends on the level of debt financing. In particular, the negative effect of DP on firm performance is more pronounced when firms have higher levels of debt financing. It is consistent with the pecking order theory of capital structure, which suggests that firms prefer to finance their investments with internal funds rather than external financing. When firms have higher levels of debt financing, they are less likely to have the internal funds to pay dividends, which can negatively affect performance.

6. Conclusion

This study aimed to analyze the influence of dividend policy and capital structure on company performance within the Egyptian environment. The data were obtained from a sample of 68 firms operating in various sectors, spanning nine years from 2014 to 2022. The research revealed a favorable correlation between dividend policy, measured explicitly by dividend per share (DPS), and firm performance, precisely measured by Tobin's Q. This finding provides empirical support for the signaling theory of dividends. The study's findings indicate a positive association between firm performance and capital structure, specifically regarding leverage ratio. This observation lends support to the trade-off theory of capital structure.

Nevertheless, upon employing the debt-to-equity ratio as a surrogate for capital structure, the researcher discovered a negative association with business performance, supporting the agency cost theory of capital structure. Furthermore, the present study has discovered a favorable interaction between dividend payout and capital structure in firm performance. This finding suggests an ideal level of dividend payout that maximizes a firm's performance. This study contributes to the existing body of literature by offering empirical information regarding the factors that influence the performance of firms operating in an emerging market characterized by distinct institutional and regulatory frameworks.

This study concludes that dividend policy and capital structure substantially impact firm performance in the Egyptian context. When making financing decisions, the findings suggest that managers should consider the signaling function of dividends and the trade-off between tax benefits and financial distress costs. The findings also suggest that when valuing equities, investors should consider companies' dividend and leverage policies. However, the limitations of this investigation must be acknowledged. First, the study was limited to non-financial firms, limiting the generalizability of the results. Second, accounting-based measures of firm performance were utilized, which may not accurately reflect the market value of firms. Thirdly, it should have accounted for factors such as corporate governance, ownership structure, and growth opportunities that influence firm performance. Therefore, future research could expand on this study by resolving these limitations and investigating additional facets of dividend policy and capital structure in the Egyptian market.

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