The Moderating role of Covid-19 Epidemic on the relation between Stock Market Liquidity and Firm Dividend Policy

Applied research on the Egyptian Stock Market

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Abstract

Purpose: This paper investigates the Influence of the Covid-19 Epidemic on the relation between stock market liquidity and firms' dividend payout policy applying to the Egyptian stock market.

Methodology: OLS and Logistic regression analysis is conducted to explain the 2 models used for a sample of (81) Egyptian Companies. Three main hypotheses are tested: (1) there is no significant influence of the Egyptian stock market liquidity on dividend policy. (2) The covid19 epidemic has no significant impact on the relationship between the Egyptian stock market liquidity and dividend policy. (3) there is no significant difference impact between the Egyptian stock market liquidity and dividend policy before and during a covid-19 epidemic

Findings: The result of this study is consistent with the majority of previous research indicating that stock market liquidity directly influences dividend policy. In addition, this paper demonstrates that Covid-19 has a detrimental impact on the

relationship between stock liquidity and dividend policy as a moderator variable.

Research limitations: The paper opens the area for future research by using a distinct dataset that includes the time period during and after the COVID-19 epidemic to capture the impact of covid-19 on the economy and the stock market.

Originality/value: Its novelty stems from the fact that its new evidence can aid in evaluating the significance of stock liquidity and its effect on dividend policy in the Egyptian stock market. The research is useful for future analysis by employing a fresh sample period for a different set of data and taking into account the COVID-19 epidemic crisis.

Keywords Dividend policy, Covid-19, Stock market liquidity

Paper type Research paper

Introduction:

Dividends are one of the most important aspects of the stock market since they can affect the number of people who invest in it. Several researchers have different perspectives on the relationship between stock market liquidity and dividend policy. Some researchers focused on factors that affected stock liquidity (Manjit et al., (2019), Huang, (2020), Yihong et al., (2021)), whereas others focused on the dividends policy, the reasons behind its increase, and what influenced that increase (Victor et al., (2021), Quoc Trung Tran, (2021), Alberta et al., (2019)).

Several arguments have been established to explain why companies pay dividends, The Signaling theory, for example, suggests that companies pay dividends to send a positive signal to the stock market. Indicating that Managers can deliver a favorable signal in the equity market by distributing dividends to alleviate agency and asymmetric information issues, Managers frequently use dividend policy to transmit to investors that the company is in better financial shape (Nguyen & Bui, 2019. Jensen's,1986. Trinh et al., 2022).

Rendering to Jensen's (1986) agency theory, the spread of information asymmetry and the agency problem is the reason of dividend smoothing, Dividend policy is governed by agency costs deriving from the segregation of control and ownership, Directors may not always adopt a dividend policy to maximize shareholder wealth owing to agency costs, but they could adopt a dividend policy to enhance their compensation, (Lambrecht & Myers, 2012).

According to Brockman et al. (2008), when a company's stock is extra liquid, the management prefers to repurchase over dividends. Consequently, the effect of market liquidity on dividends payout policy is uncertain. Therefore, this research investigates the moderating role of the Covid-19 epidemic on the relationship between the dividend payout ratio and Egyptian

stock market liquidity during the period from 2018 to 2021, applying to the Egyptian stock market.

Research aims and objectives:

In order to fill the void in this area, the current study aims to illustrate and analyze the relationship between equity market liquidity and dividend policy in the Egyptian economy, as well as the effect of the covid-19 epidemic on this relationship, in order to make policymaker-friendly recommendations for:

1- Define the connection between equity market liquidity and dividend policy.

2- Contribute to the literature on finance regarding this topic

3- Advise the investor on stock market liquidity

Literature review:

The literature assessing the relationship between liquidity and dividends is well-established. Nevertheless, the literature provides contradictory outcomes and evidence. Miller and Modigliani (MM) (1961), who envisaged a frictionless market, theorized that investors do not care whether they earn dividends nowadays or capital gains in the future. Given that markets may not be frictionless, some theories anticipated that dividends are important to firm value (Walter, 1963; Gordon, 1959, 1963). According to these beliefs, paying dividends provides investors with a positive signal about the company and increases the stock

price. However, paying smaller amounts of dividends creates investor ambiguity and decreases stock liquidity.

Lintner (1956) and Gordon (1959) introduced the bird-in-hand theory, according to which investors prefer to get dividend payments in the present rather than future capital gains. Investors strive to acquire shares whose dividend policy meets their cash requirements. In addition, Jensen (1986) argues that the agency problem seems to be the primary driver of dividend policy. Given the impact of managerial opportunism on dividend distribution, shareholders who wish to safeguard their capital expenditures would choose more conservative control mechanisms that increase agency costs.

In line with the literature on market microstructure, stock liquidity has a significant effect on dividend policy. Initially, market liquidity might be advantageous to dividends by boosting corporate performance (Maurg, 1998). Within the theoretical and empirical background, liquidity is expected to have a beneficial effect on value (Fang, Noe, & Tice, 2009; Nguyen, Duong, & Singh, 2016). Additionally, It is widely believed that successful companies tend to pay dividends at a higher rate (Denis & Osobov, 2008; Fama & French, 2001). Moreover, stock liquidity contributes to the reduction of the knowledge gap between insiders and stockholders (Holmstrom & Tirole, 1993; Kyle, 1984). Consequently, the incentives for business managers to retain earnings for personal use or investments that provide a concealed advantage are less, resulting in a higher

motivation for these managers to release gains as dividends. (Jensen & Meckling, 1976).

Ali (2022) investigated the effects of the COVID-19 epidemic on the dividend policies of enterprises. Using a sample of 8889 G-12 companies, the findings reveal that even while the fraction of dividend reductions and omissions is significantly higher during the epidemic, the majority of companies may be maintained or increased dividends. According to dividend signaling theory, firms may pursue more steady dividend practices to convey their financial outlook throughout the crisis. A logit regression analysis clarified that profitability, earnings predictions, firm size, and leverage were key determinants of dividend policy decisions during the epidemic.

Taher and Al-shboul (2022) investigated the influence of dividend payout on stock market liquidity and the unbalanced impact of dividend payouts on stock liquidity. Using multivariate panel regression on a sample of the 411 biggest nonfinancial US corporations, it was concluded that dividend policy is negatively correlated with stock liquidity. Specifically, Greater dividend payments have a weaker impact on stock liquidity than lower dividend payments.

Nguyen, T.-G. (2020), studied the perception of stock market liquidity on the dividend distribution policies of Australian firms. The results concluded a positive correlation between stock

liquidity and dividend payments. Multiple model estimations and varied measurements of stock liquidity/dividend did not alter the conclusion. The study suggests that stock liquidity has a causal effect on dividends paid by corporations. In addition, the study demonstrates that stock liquidity boosts business dividends by dropping cash-flow impulsiveness and that the impact of stock market liquidity on company dividends is diminished for businesses that claim accusation tax credits.

Botoc and Pirtea (2014) investigated the dividend payout strategies of 2,636 firms in sixteen developed nations (emerging) and examined the relationship between cash position and dividend distribution to extend the residual cash flow theory. Because dividends are paid in cash and represent current obligations (liabilities), it was used as a proxy for a company's ability to repay current liabilities using current assets minus stock (liquidity ratio) and for the amount of cash spent in day-to-day operations (working capital). In addition, the paper examined if previous findings had changed over time. Their findings corroborate the idea of dividend residual cash flow due to the fact that liquidity and cash management affect dividend payments. When shareholders are well-protected, cash demands account for a larger part of dividend payouts; when shareholders are less well-protected, liquidity accounts for a larger share. Furthermore, they identified evidence for the dividend substitution theory, which posits that, regardless of the firm's risk, countries with

inadequate shareholder protection project bigger dividend amounts due to the need to establish a positive reputation.

Singhania and Gupta (2012), investigated the dividend policy determinants of 50 index companies in India, by analyzing the effect of four variables on dividend policy: company size (market capitalization), firm growth and investment opportunity, firm debt structure, and firm profitability and experience. According to the results, debt structure, firm success, and experience had an impact on dividend policy. The importance of the company's size, growth prospects, and investment opportunities has been established.

Al-Haddad et al. (2011) investigated the dividend policy of Amman Stock Exchange (ASE)-listed financial institutions over a period from 2000 to 2006. The stability of dividend payment ratios and the associated dividend policy are also evaluated; the findings reveal that the cash dividend policies of the banking industry are not secure. Ahmad and Wardani (2014) analyzed the impact of fundamental factors on the dividend decision of 98 companies registered on the Indonesia Stock Exchange between 2006 and 2009 using logit regression, the study determined the relationship between the independent and dependent variables. According to the findings of the study, profitability and firm size have a significant positive relationship with the dividend policy, There is a significant inverse relationship between dividend policy, liquidity, and debt. In addition,

the results indicate that there is no significant connection between dividend policy and growth forecasts.

Kibet (2012) analyzed the effect of firm variables (liquidity, leverage, profitability, cash flow, corporation tax, sales growth, and earnings per share) on the dividend policy of companies recorded on the Nairobi stock exchange during a period from 2007 to 2011. The findings suggested that liquidity had a positive effect on dividend distribution. The dividend payout increases in tandem with liquidity levels, and vice versa. The collected, evaluated, and derived conclusions suggest that firms maintain high liquidity thresholds to reduce the danger of a financial crisis. The paper accomplished this by using superior business methods and maximizing its working capital management. Furthermore, it revealed that firms have adequate liquidity to pay dividends on time. According to the findings of the study, profitability had a major effect on dividend distribution, with companies that made more revenue handing out greater dividends to shareholders. Profitability is a proxy for a company's ability to pay dividends; hence, more earnings result in greater dividend payments. Earnings per share had a small impact on dividend distribution, illustrating that a high return on equity does not inevitably result in a higher dividend payout.

Along with the importance investors placed on payout regularity, dividends were considered a crucial source of information when the late corporate dividend policy emerged in the early nineteenth

century. Due to the deficiency, inaccuracy, and insufficiency of financial data, investors evaluate companies primarily on dividend payments rather than reported income. Investors rely on dividend policy to determine management's expectations for future success. Consequently, a rise in dividend payouts was often accompanied by a rise in stock prices. Attributable to the fact that investors perceive dividend announcements as a proxy for income growth, firms' awareness of this outcome enhanced the possibility that management would utilize dividends to indicate optimistic earnings estimates and/or to bolster a company's share price. (Al-Malkawi et al., 2010)

Al-Qaisi and Omet (2010) investigated the issue of dividend policy stability and/or its determinants for Jordanian corporations listed on the Amman Stock Exchange between 1995 and 2005. Their research aimed to identify "whether Jordanian companies maintained a consistent dividend policy" by examining companies from various industries or groups. According to their findings, listed Jordanian companies adhere to stable policies to a substantially greater degree. Moreover, according to the study, the banking and services sectors have more consistent dividend policies than the industrial and insurance sectors.

Sudhahar and Saroja (2010) analyzed the patterns and determinants of the dividend policies of Indian banks publicly traded on the Bombay Stock Exchange during the period from 1997 to 2007. The

data demonstrated that Indian banks maintained a consistent dividend policy. There is evidence that fifty percent of banks have dispersed more than thirty-six percent of their profits as dividends. Additionally, return on investment (ROI), the dividend payout ratio from the previous year, and sales volume have a beneficial impact on the dividend policies of Indian banks.

Griffin (2010) discovered that dividends reduce the need for liquidity since owners do not have to wait for a buyer or reduce the price to attract buyers, and dividends provide investors with the necessary returns. Holders of liquid shares, on the other hand, Might generate their quick dividends by selling a portion of their portfolio at a low price, and maybe at a higher price. However, the paper doubted that this inverse link holds in developing markets, where liquidity is lower than in developed markets.

Omran and Pointon (2004) studied a relationship between dividends, firm liquidity, and profitability in the Egyptian market. They found that dividend cuts are associated with a lack of liquidity and profitability. The results confirm that for actively traded stocks, retentions are more important than dividends, whereas accounting book value, not dividends or earnings, is the most influential factor on the price of non-actively traded stocks. The results imply that dividends should be lowered, and capital should be retained to finance investment opportunities. Companies whose shares are not actively traded choose not to

pay a decreased dividend payment ratio in order to finance investment opportunities.

Banerjee et al. (2007) examined the dividend liquidity hypothesis. The study investigated control variables such as business profitability, size, and expansion potential. They argue that at least two reasons justify the need to account for these factors. Firstly, The study argued that if dividend policy determinants are consistent with the function of dividends in managing free cash flow agency costs (Easterbrook, 1984) and a pecking order pattern in which firms avoid issuing securities because of disproportionate information costs and other flotation costs and repercussions. Secondly, the profitability, size, and expansion possibilities of a corporation might influence its common stock's liquidity. Consequently, it is vital to inspect the effect of stock liquidity on dividend policy after considering the likelihood of a connection. Their findings indicate that corporations with highly liquid stocks (i.e., equities with a high degree of trading activity, a low percentage of non-trading days, and a low-price impression of order flow) are less likely to pay dividends (and vice versa). After adjusting for the firm control variables indicated, these conclusions remain true. Additionally, because investors may earn dividends cheaply on liquid markets, there will be less demand for cash dividends from the assets they purchase. Consequently, corporations with less (or more) liquid shares will be more (or less) inclined to pay cash dividends to shareholders. In addition, they determined that cash dividends and liquidity in the stock market give

investors more possibilities. The stock prices of dividend-paying corporations are less susceptible to aggregate liquidity, most likely because they shield investors from systematic liquidity risk. Due to market deficiencies, the dividend policy may impact the value of the company.

Lesmond (2005) evaluated the liquidity of emerging markets by utilizing the bid-ask spread as a near-perfect reflection. In general, Latin American markets are less liquid than those in South Asia, East Asia, Europe, and Africa/Middle East, regardless of their size. These results emphasize the limitations of combining data for price, volume, and company size categorizations in developing markets when utilizing broad country descriptors or firm characteristics of trade difficulty assessments. Amihud (2002) addressed the hypothesis that illiquidity boosts asset expected returns, as well as how it is known that illiquidity creates expected return disparities between shares, a result verified here. His findings indicated that market-expected illiquidity has a long-term effect on ex-ante stock excess returns and compensates for the inferior liquidity of stocks compared to Treasury securities. In addition, predicted excess returns on stocks do not remain constant over time due to fluctuations in market illiquidity.

Therefore, Within the above framework support the premise that increasing stock liquidity reduces the knowledge asymmetry

between insiders and shareholders, thereby decreasing dividends. This current study is applied to the Egyptian equity market and is focused on the relationship between stock market liquidity and dividends policy using the covid-19 epidemic as a moderator variable to investigate the impact of covid-19 on the relationship between stock market liquidity and dividends policy. Finally, it will generate recommendations for future situations similar to the covid-19 epidemic.

Research problem and Hypotheses:

Despite many studies investigating the relationship between stock market liquidity and dividend policy in developed countries, the empirical evidence is still limited in the Egyptian Equity market. According to our knowledge, limited studies examined the relationship before and during the cover-19 Epidemic. Therefore, the contribution of the study is to investigate the relationship between stock liquidity and dividend policy in the Egyptian economy over the period 2018-2021.

How does the Covid-19 epidemic as a moderator variable influence the relationship between stock market liquidity and dividend policy in the Egyptian stock market?

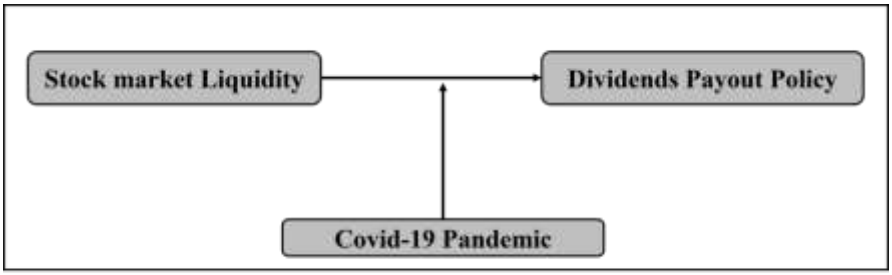
The hypotheses are established as follows:

H_{O1}: *There is no significant influence of the Egyptian stock market liquidity on dividend policy.*

H_{O2}: *The covid-19 epidemic has no significant influence on the relationship between the Egyptian stock market liquidity and dividend policy.*

H_{O3}: *There is no Difference significant influence between the Egyptian stock market liquidity and dividend policy before and during a covid-19 epidemic*

Figure (1): Research Model



Source: Design by the researcher

Data Analysis and Variables description:

The dataset consists of (218) businesses listed on the Egyptian Stock Exchange, And the sample is (81) companies registered on the Egyptian Stock Exchange excluding financial firms between 2018 and 2021, for testing hypothesis (3) will split the period into two years 2018-2019 preceding the covid-19 and the two years 2020- 2021 during the covid-19 to measure the moderator role of the covid-19.

The dependent variable: Dividend Policy

To answer research questions dividend policy are measured as follow:

$$\textbf{DPO} = \frac{DPS}{EPS}$$

DPO: Dividend Payout Percentage for firm *i* in year *t*.
DPS: Dividend per Share for firm *i* in year *t*.
EPS: Earnings per Share
PO: Dummy Variable takes 1 if the firm pays a dividend, and 0 if no dividend.

The independent variable: Stock Liquidity

Liquidity itself is not observable, so it is subjected to many measurements, the study uses two common measurements to capture liquidity:

The Spread: For each value of the sample and each day, the spread is calculated as the variance between the purchase price and the sale price divided by the average of the two prices. Indeed, it is calculated over a year. And it is equal to the average of the spread computed for this period. This variable was measured in the same way by Heflin (2001) and Attig. et al (2006).

$$\textbf{SPRD} = (\textbf{Price ask} - \textbf{Price Bid})/M_t$$

Where:
M_t: (ASK price + BID price) / 2

Due to a paucity of data on the Egyptian stock market, the researcher calculates SPRD as the variation between the annual highest price and the annual lowest price.

SPRD = (Annual highest price – Annual lowest Price)/M_t

Where:

M_t: (annual highest price + annual lowest price) / 2

Wide SPRD means less liquidity stock and vice versa.

Turnover Ratio: measured as shares traded on shares outstanding for calendar year i, Turnover captures trading frequency, Thus, a stock with a high turnover rate indicates that investors hold it for a shorter period of time, which indicates high liquidity and vice versa.

Control Variables:

Firm Profitability: as determined by the return on average total assets (ROA). A corporation with more profitability can afford to pay dividends, hence a positive relationship is anticipated. (Botoc and Pirtea, 2014), which is calculated as follows:

$$\textbf{ROA} = \frac{\textit{Net income}}{\textit{Average total assets}}$$

Firm Size: There is a positive association between company size and dividend payout since larger firms have better market access and should be able to pay higher dividends. To measure the size (S), the natural logarithm of total assets is used to express firm size.

FS= Log of total assets

Firm Growth: gauges the growth rate of total assets over one year. Given the profitability of future investments, the reinvestment policy is likely to be implemented in lieu of distributing dividends. Consequently, a negative correlation is anticipated between growth potential and dividend distribution. (Botoc and Pirtea, 2014). which is calculated as follows:

$$GO_{it} = Log\ (Total\ Assets_{t} - Total\ Assets_{t-1}) / Total\ Assets_{t-1}$$

Descriptive Statistics

Table (1) result of Descriptive Statics

Variable	Obs	Mean	Std. Dev.	Min	Max
DPO_{it}	324	.235	.499	0	5.263
SPRD	324	.395	.375	.001	2
TO	324	1.665	4.221	.04	65.867
FS_{it}	324	3.456	.682	1.306	5.142
GO_{it}	324	.129	.705	-1	7.499
ROA	324	.029	.181	-1.439	.68

Source: outputs of Stata V15 program

Table (2) frequency distribution for DP Variable

DP_{it}	Freq.	Percent	Cum.
0	197	60.80	60.80
1	127	39.20	100.00
Total	324	100.00	

Source: outputs of Stata V15 program

The previous table shows, that the number of companies that pay dividends is 127 companies by 39.20% of the sample size, but the largest number of companies that do not pay dividends is 197 companies are 60.80% of the study sample.

Statistical Methods Used.

To determine the type of relationship between the study variables and the validity of the Hypotheses of the study, the following statistical methods were used:

- Residuals Heteroskedasticity Test,
- Normality of Residuals test,
- Multi-Linear Correlation,
- Multicollinearity and Autocorrelation test
- Two regression methods were used in order to explain each model of the study:

- OLS Regression to explain Model (1).
- Logistic Regression to explain Model (2).

Proposed Measurement Model

To estimate the effect of the Covid-19 Epidemic on the relation between Stock Market Liquidity and Firm Dividend Policy, and to test the significance and strength of the relation the following regression models are used:

$$DPO_{it} = a + \beta_1 SPRD_{it} + \beta_2 TO_{it} + \beta_3 ROA_{it} + \beta_4 FS_{it} + \beta_5 GO_{it} + \varepsilon \quad (1)$$

$$DP_{it} = a + \beta_1 SPRD_{it} + \beta_2 TO_{it} + \beta_3 ROA_{it} + \beta_4 FS_{it} + \beta_5 GO_{it} + \varepsilon \quad (2)$$

Where:

DPO_{it}	Dividend Payout Ratio for firm $_i$ in year *t*
DP_{it}	Firm pay dividend $_i$ in year *t*
a, β1, β2, β3, β4, β5	model coefficient
$SPRD_{it}$	Relative Spread for firm $_i$ in year *t*
TO_{it}	Turnover of stock for firm $_i$ in year *t*
ROA_{it}	Return on average assets of firm $_I$ in year *t*
FS_{it}	Firm size $_i$ in year *t*
GO_{it}	Firm growth opportunities $_i$ in year *t*
Covid-19	Moderator variable

Multicollinearity and skewness tests

To test the existence of multicollinearity between the independent variables, Variance Inflation Factor and Tolerance tests are used for each independent variable according to the following rules used for each independent variable:

- Variance Inflation Factor (VIF) <= 10
- Tolerance > 0.05

To ensure that normal distribution data are followed, skewness factors are calculated, where the Null hypothesis states that the data follow the Normal distribution if the skewness factor is < 1.

Table (3) Result of Multicollinearity and skewness factors

VARIABLES	VIF	TOLERANCE	SKEWNESS
$SPRD_{it}$	1.02	0.6695	0.457
TO_{it}	1.02	0.7839	0.348
ROA_{it}	1.09	0.5489	0.650
FS_{it}	1.11	0.7420	0.499
GO_{it}	1.01	0.5347	0.604

Source: outputs of Stata V15 program

The results of the previous table indicate to:

- Variance Inflation Factor (VIF) is between 1.01 and 1.09, which indicates the absence of correlation between the explanatory variables in the model.
- Tolerance values for all variables were greater than (0.05) and ranged between (0.5347-0.7839), indicating that there was no high correlation between independent variables (Multicollinearity) that could lead to misleading results when analyzing regression,
- Skewness factor also indicates that the data follow the Normal distribution where the values of the coefficient range from (0.348 to 0.650) which is less than 1.

Correlation Results

Pearson Correlation Coefficient: A test that measures the statistical relationship or correlation between study variables and gives information about the Strength of the relationship and the direction of the relationship. the r value in a person's relation coefficient ranges from -1 to 1. The negative signal indicates that the relationship is inverse, while the positive signal indicates a direct relationship. The following is an explanation of the Correlation values:

- R=0 indicates no linear relationship between variables
- If (R>0 to 0.5) indicates a weak relationship between variables.
- If (R>0.5 to 0.7) indicates a medium relationship between variables.
- If (R>0.7 to 1) indicates a strong relationship between variables.

Table (4) Matrix Correlation between study variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) DPO_{it}	1.000					
(2) SPRD	0.466	1.000				
(3) TO	0.544	0.114	1.000			
(4) FS_{it}	0.319	-0.119	-0.127	1.000		
(5) GO_{it}	0.650	-0.018	0.013	0.082	1.000	
(6) ROA	0.500	0.032	0.007	0.337	0.041	1.000

Source: outputs of Stata V15 program

Correlation results show that there is a medium relationship between the dependent variable DPO and the independent variables (SPRD-TO-FS-GO-ROA) where the values of the correlation factor ranged from (0.319 to 0.650).

Hypotheses Testing and Result Discussion

OLS Regression Results

The study seeks to test the following main imposition (***H_{O1}**: there is no significant influence between the Egyptian stock market liquidity and dividend policy)*

Before assessing the relationship to the proposed model, the Doornik-Hansen test and the Heteroskedasticity test are performed to examine the distribution of the Residual of the model and to ensure the validity of the estimated model variables for the study**.**

1-Doornik-Hansen test**:** Doornik-Hansen test is based on the normality of multiple variables, it is based on skewness testing and **Kurtosis** of study variable data it examines the characteristics of variables in terms of independence, so it is better than the Shapiro-Wilk test when examining the normal distribution for a proposed regression model, and in terms of testing assumptions:

- H_0: Residual follows a normal distribution if the p-value is greater than 0.05 (P>0.05)
- H_1: Residuals do not follow a normal distribution if the p-value is less than 0.05 (P< =0.05)

2-**Heteroskedasticity** test**:** The importance of the test is that **Heteroskedasticity Residual** or Error Terms in the standard model are linked in one form or another to the Endogenous or Dependent Variable in the original model.

- H_0: Residual has no problem with heteroskedasticity if the P-value > 0.05
- H_1: Residual has a Heteroskedasticity problem if P-value < 0.05

The following are the results of the Doornik-Hansen test to confirm the validity of multiple regression model variables, and the results of the Breusch Pagan Godfrey test for **Heteroskedasticity** testing

Figure (2) Results of study model examination tests

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of DPOit
chi2(1) = 125.46
Prob > chi2 = 0.5620

Test for multivariate normality
Doornik-Hansen chi2(2) = 847.834 Prob>chi2 = 0.09481

Source: outputs of Stata V15 program

The previous results show that the Residual value of the Doornik-Hansen test was 0.0948, which is greater than 0.05, indicating that the regression model follows the normal distribution and accordingly accepts the null Hypothesis that "the Residual follows the normal distribution if the p-value for Residual is greater than 0.05", and we reject the alternative Hypotheses.

The results also show that the value of the Breusch Pagan Godfrey test is 0.5620, which is greater than 0.05, indicating that the Residual does not have a **Heteroskedasticity** problem and therefore accepts null Hypotheses and rejects the alternative one.

Table (5) Results of the estimated regression for Model 1

DPOit	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
SPRD	.079	.074	4.07	.007	.066	.224	**
TO	.007	.007	3.05	.005	.02	.006	**
FS_{it}	.055	.043	8.86	.002	.122	.048	**
GO_{it}	.037	.039	3.96	.008	-.113	.039	**
ROA	.6	.16	3.74	.000	.284	.915	**
Constant	.331	.158	2.10	.037	.021	.641	**

Mean dependent var	0.235	SD dependent var	0.499
R-squared	0.652	Number of obs	324
F-test	3.472	Prob > F	0.005
Akaike crit. (AIC)	462.145	Bayesian crit. (BIC)	484.830

*** *p<.01*, ** *p<.05*, * *p<.1*

Source: outputs of Stata V15 program

The previous table shows the results of the multiple Regression Test, to determine the effect of the independent variable Stock

Liquidity (SPRD – TO) and control variables (FS-GO-ROA) on Dividend Policy.

The R-squared coefficient of determination is 0.652, which means that 65% of the changes in Dividend Policy are explained by model-independent variables and 35% of the change is due to other factors not included in the model.

The previous table shows that the F test value of the model, which has reached 0.000, is significant at 0.05, indicating that the proposed model has great convenience and interpretive power, which means rejecting the null Hypothesis "H_{O1}: ***there is no significant influence between the Egyptian stock market liquidity and dividend policy"***. And accepted the Alternative one.

The results of the regression test for the hypothesis of the study show that the coefficient of liquidity stock variables (SPRD-TO) and control variables (FS-GO-ROA) are significant at 5%, where the p-value range from (0.00 to 0.037), confirming the significant impact of liquidity stock variables on Dividend Policy. And We can therefore conclude the following regression equation:

$$DPO_{it} = 0.331 + 0.079\ SPRD + 0.007\ TO + 0.600\ ROA + 0.055\ FS + 0.037\ GO + \varepsilon$$

From beta coefficient values for study model variables, we conclude the following:

- There is a positive impact between SPRD and DPO. If SPRD increases by 100%, the DPO increases by 7.9%.
- There is a positive impact between the Turnover of stock for the firm and DPO. If TO increases by 100%, the DPO increases by 0.7%.
- There is a positive impact between ROA and DPO. If ROA increases by 100%, the DPO increases by 60%.
- There is a positive impact between FS and DPO. If FS increases by 100%, the DPO increases by 5.5%.
- There is a positive impact between GO and DPO. If GO increases by 100%, the DPO increases by 3.7%.

Logistic Regression Results

Table (6) depicts the results of model (2) which aims to examine the relationship between the likelihood of paying a dividend and stock liquidity.

Table (6) Results of the estimated Logistic regression for model 2

DPit	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
SPRD	.866	.346	4.36	.009	.396	1.895	**
TO	.97	.054	3.54	.009	.87	1.082	**
FSit	3.243	.807	4.73	.000	1.991	5.281	**
GOit	.907	.16	7.55	.058	.642	1.281	**
ROA	.9	.416	6.58	.000	2.269	6.286	**
Constant	.005	.005	5.37	.000	.001	.035	**

Mean dependent var	0.392	SD dependent var	0.489
Pseudo r-squared	0.267	Number of obs	324
Chi-square	115.742	Prob > chi2	0.000
Akaike crit. (AIC)	330.174	Bayesian crit. (BIC)	352.859

*** *p<.01, ** p<.05, * p<.1*

Source: outputs of Stata V15 program

The table provides Logistic linear regression results for model (2) of the study. The model is used to determine the effect of independent variable Stock Liquidity (SPRD – TO) and control variables (FS-GO-ROA) on Dividend Payer firm in the year

The R-squared coefficient of determination is 0.267, which means that 26.7% of the changes in Dividend Payer firm in the year are due to the change in stock liquidity variables (SPRD-TO) and control variables (FS-GO-ROA), the residue of the ratio is due to other factors that fall outside the correlation between the study variables.

The previous table shows that the Chi-square test value of the model, which has reached 0.000, is significant at 0.05, indicating that the proposed model has great convenience and interpretive power. which means rejecting the null Hypotheses "H_{01}: ***there is no significant fluence of the Egyptian stock market liquidity on dividend policy"***. And accepted the Alternative one.

The results of the regression test for the hypothesis of the study show that the coefficient of liquidity stock variables (SPRD-TO) and control variables (FS-GO-ROA) are significant at 5%, where the p-value range from (0.00 to 0.058), confirming the significant impact of liquidity stock variables on Dividend Policy. And We can therefore conclude the following regression equation:

$$DP_{it} = 0.005 + 0.866\ SPRD + 0.97\ TO + 0.900\ ROA + 3.243\ FS + 0.907\ GO + \varepsilon$$

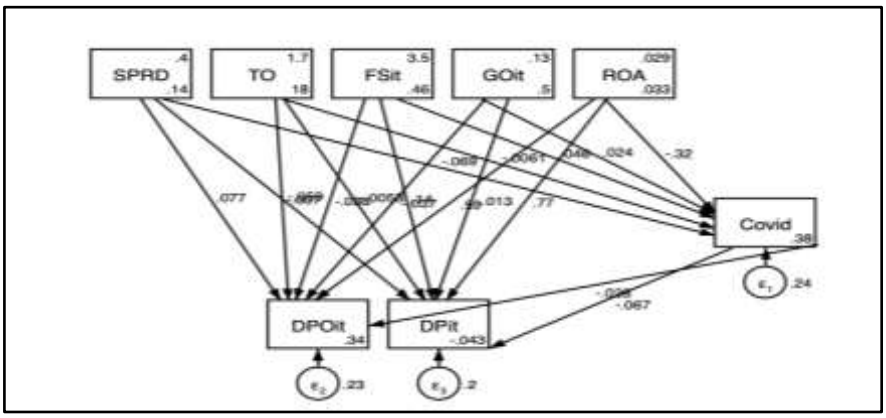
It can be concluded that logistic linear regression provides similar results to OLS regression with a difference in the level of significance and the coefficient of determination which leads to conclude that stock liquidity, measured using the relative spread and stock turnover, affects the Firm dividend policy, measured through dummy variable (i.e., whether the company pay dividend or not) and dividend payout ratio (i.e., DPS/EPS).

Path analysis

H_{O2}: The covid19 epidemic has no significant influence on the relationship between the Egyptian stock market liquidity and dividend policy.

To test Hypothesis (2) of the study that the covid-19 epidemic affects the relationship between Egyptian stock market liquidity and dividend policy. Path analysis was used to study this relationship

Figure (3) Results of Path analysis



Source: outputs of Stata V15 program

Path analysis shows that there is a negative impact relationship between the Covid-19 epidemic variable and independent variables Relative Spread and Turnover of stock for the firm, also there is a negative impact relationship between the Covid-19 and control variable ROA.

Also, covid-19 has a negative impact on the Dividend Payout Ratio for the firm and Dividend Payer firm, if covid-19 increases by 1 unit the Dividend Payout Ratio for the firm in the year will be decreased by 2%, and the Dividend Payer firm in the year will be decreased by 6%. which means rejecting the null Hypothesis "***H_{O2}: The covid19 epidemic has no significant influence on the relationship between the Egyptian stock market liquidity and dividend policy"***. and accepted the Alternative Hypothesis that the covid-19 has a significant impact on the relationship between the Egyptian stock market liquidity and dividend policy.

OLS Regression Results before and after a covid-19 epidemic

The study seeks to test the following Hypotheses (***H_{O3}: there is no significant impact between the Egyptian stock market liquidity and dividend policy before and after a covid-19 epidemic****), for the study of this* Hypothesis, Multiple regression analysis was tested for the time period 2018-2019 data which is the period before the covid-19 epidemic, and analysis data period 2020-2021, the period of the covid-19 epidemic.

Table (7) Results of the estimated regression before the covid-19 epidemic

Linear regression 2018-2019

DPOit	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
SPRD	.315	.097	3.23	.001	.122	.507	***
TO	.009	.007	1.31	.001	-.022	.004	***
FSit	.041	.057	3.71	.009	-.154	.073	***
GOit	.112	.062	4.19	.009	-.134	.111	***
ROA	.594	.221	2.69	.008	.158	1.031	***
Constant	.26	.205	1.27	.007	-.145	.664	***

Mean dependent var	0.261	SD dependent var	0.494
R-squared	0.615	Number of obs	162
F-test	4.058	Prob > F	0.002
Akaike crit. (AIC)	222.111	Bayesian crit. (BIC)	240.636

*** *p<.01, ** p<.05, * p<.1*

Table (8) Results of the estimated regression After a covid-19 epidemic

Linear regression 2020-2021

DPOit	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
SPRD	.207	.113	1.84	.008	.403	.015	***
TO	.003	.02	3.17	.009	.042	.036	***
FSit	.034	.065	5.98	.008	.193	.065	***
GOit	.031	.05	3.63	.003	.129	.067	***
ROA	.577	.232	2.48	.014	.118	1.037	***
Constant	.511	.243	2.10	.037	.031	.99	***

Mean dependent var	0.209	SD dependent var	0.504
R-squared	0.582	Number of obs	162
F-test	2.959	Prob > F	0.008
Akaike crit. (AIC)	238.609	Bayesian crit. (BIC)	257.135

*** *p<.01, ** p<.05, * p<.1*

Table (6 and 7) shows the results of the Multiple Regression Test, to determine the effect of independent variable Stock Liquidity (SPRD – TO) and control variables (FS-GO-ROA) on the Dividend Policy *before and after covid-19 epidemic:*

The R-squared coefficient before covid-19 is 0.616, which means that 61% of the changes in Dividend Policy is because of the change in stock liquidity variables (SPRD-TO) and control variables (FS-GO-ROA), After spread of covid-19 The R-squared coefficient decreased to 58%

F-test result of two models is (4.05 - 2.95), and prob-F is less than 0.05, indicating acceptance of the suggested two models to explain the relationship between variables, thereby rejecting the null hypothesis "***H_{O3}: there is no Difference significant impact between the Egyptian stock market liquidity and dividend policy before and after a covid-19 epidemic"***. And accepted the Alternative Hypotheses.

Based on the regression results, it is evident that the significance of the beta coefficients for the two models is less than 5%, indicating that the Egyptian stock market liquidity variables have an effect on Dividend Policy. Consequently, we can draw the following two regression equations:

$$DPO_{i2018\text{-}2019} = 0.26 + 0.315\ SPRD + 0.009\ TO + 0.594\ ROA + 0.041\ FS + 0.112\ GO + \varepsilon$$

$$DPO_{i2020-2021} = 0.51 + 0.207\ SPRD + 0.003\ TO + 0.577\ ROA + 0.034\ FS + 0.031\ GO + \varepsilon$$

Compared to the scenario before the covid-19 epidemic, the effect of all independent variables (SPRD-TO) and control variables (FS-GO-ROA) on Dividend Policy falls after the epidemic.

Conclusion:

The study concluded that there is a direct, statistically significant relationship between stock market liquidity and dividend policy in the Egyptian stock market, indicating that the greater the liquidity, the higher the dividend distribution, based on the results of the regression models used, which is consistent with the findings of Walter(1963), Gordon (1959,1963), Linter(1959), Jansen (1986), kyle(1984), Maurge (1998), Fang, Noe(2009), and Al-Malkawi(2010 (2007). In order to present a more complete picture of corporate dividend policy during the epidemic, this study explores the moderator role of the COVID-19 epidemic on this relationship using a sample of 81 listed firms. This study demonstrates that the COVID period has experienced relatively higher rates of dividend cuts and eliminations. Using The Path analysis to examine the effect of Covid-19 on the relationship between stock liquidity and dividend policy, finding revealed that there is an effect of Covid-19 on the relationship between market liquidity and dividends, suggesting that this relationship should

be taken into account when determining dividend policy for the coming years.

Recommendations for future research:

It is conceivable to retest the variables using a longer time frame after the Corona-19 epidemic and a larger dataset to include a larger number of firms, especially in the financial sector. It is also possible to investigate the relationship between stock market liquidity and distribution decisions in firms from various sectors and compare the results, especially when investigating the impact of the Corona-19 epidemic on this relationship.

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