The Efficiency of Investment Decisions Under the Impact of Cash Dividends on Stock Liquidity in Emerging Markets: Evidence From EGX

Sharihan M. Aly

Lecturer of Business Administration, Accounting and Finance Department, College of Management & Technology, The Arab Academy for Science, Technology & Maritime Transport (AASTMT), Smart village, Egypt. ORCID: 0000-0002-0865-2199; Email: dr.sharihanmohamed@aast.edu

Abstract

This study provides the comprehensive empirical investigation into the triangular nexus between cash dividend policy, stock liquidity, and investment efficiency on the Egyptian Exchange (EGX). Utilizing an unbalanced panel of 530 firm-year observations (2015–2022) and a rigorous Baron-Kenny mediation framework, we demonstrate three key findings. First, contrary to signaling theory, cash dividends significantly erode stock liquidity (TURN2), likely due to financing frictions that arise when internal funds are depleted, forcing costly external capital raising. Second, this reduction in liquidity directly aggravates investment inefficiency, as firms face higher costs of capital and reduced price-based governance. Third, and most critically, stock liquidity acts as a statistically significant, albeit partial, mediator: approximately 23% of the negative effect of dividends on investment efficiency is transmitted through the liquidity channel. Our results reject the null hypotheses for all direct and indirect paths, revealing that while dividends impair efficiency both directly (via financing constraints) and indirectly (via liquidity), liquidity reforms alone cannot fully offset these adverse effects. This nuanced finding has profound policy implications: regulators aiming to improve capital allocation must integrate dividend tax incentives with complementary measures to deepen market liquidity (e.g., expanding market-making programs, increasing free-float) and reduce broader financing frictions.

Keywords

Investment Decisions; Cash Dividends; Stock Liquidity; Emerging Markets; EGX

1. Introduction

Dividend policy, stock liquidity, and the efficiency of corporate investment decisions form a triangular nexus that has pre-occupied financial economists since the irrelevance proposition of Miller & Modigliani (1961). In perfect markets, payout decisions should not affect firm value; yet, in the real world—especially in emerging capital markets—frictions such as information asymmetry, weak legal enforcement, and concentrated ownership structures create channels through which dividends can alter liquidity, which in turn can feed back into the quality of real-side investment decisions. Understanding these channels is critical in Egypt, a textbook example of an emerging market that has moved from a state-dominated to a hybrid institutional setting where minority-rights protection is still evolving (Omran, 2009).

The Egyptian Exchange (EGX) offers a fertile laboratory for three reasons. First, between 2015 and 2022 the bourse experienced episodic shocks—currency devaluation, IMF conditionality, and the COVID-19 liquidity crunch—that exogenously widened bid-ask spreads and heightened the opportunity cost of retaining cash. Second, free-float ratios remain low by MENA standards (EFSA, 2021), implying that any liquidity dividend induced by cash payouts is unlikely to be fully arbitraged away. Third, corporate governance reforms enacted in 2016 (Egyptian Corporate Governance Code, Ministerial Decree 96/2016) require listed firms either to publish an explicit dividend policy or justify non-payment, mitigating but not eliminating the self-selection bias that plagues voluntary-disclosure studies.

Despite these institutional idiosyncrasies, the Egyptian evidence remains fragmentary. Prior single-country studies (e.g., Hassan et al., 2020; Farag & Mallin, 2021) either treat dividends as an exogenous control variable or focus on valuation effects rather than real efficiency. Our study therefore asks: Do cash dividends enhance or erode stock liquidity, and does any such liquidity shift propagate into the efficiency of subsequent capital allocation decisions? By integrating an investment-demand framework (Biddle et al., 2009) with a liquidity-supply perspective (Cheung et al., 2023), Study provides the Egyptian study that jointly models (i) dividends → liquidity, (ii) liquidity → investment efficiency, and (iii) dividends → liquidity → investment efficiency within a unified Baron-Kenny mediation setting.

The contribution is three-fold. Academically, we enrich the thin but growing emerging-market literature that links payout policy to real efficiency (Chen et al., 2017; Aivazian et al., 2019). Practically, regulators at the Egyptian Financial Regulatory Authority (FRA) are currently debating whether to lower the 5% capital-gains tax on dividends if firms meet minimum free-float thresholds; our liquidity channel evidence informs that debate. Finally, the paper responds to the recent call by the International Finance Corporation (IFC, 2022) for "granular evidence on how capital-market frictions distort resource allocation in MENA economies."

2. Literature Review and Hypothesis Development

2.1 Dividend policy and stock liquidity: theory

The sign of the dividend–liquidity relation is theoretically ambiguous. On the one hand, dividends can act as a signalling device (Bhattacharya, 1979) that reduces information asymmetry and widens the pool of potential traders, thereby improving liquidity (Banerjee et al., 2007; Chen and Dang, 2022). On the other hand, dividend payments shrink internal cash, forcing managers to approach external capital markets more frequently. In environments where rights issues are costly or rationed, the resulting financing friction can widen bid-ask spreads (Lemmon & Lins, 2003; Boubaker et al., 2023). Empirically, Banerjee et al. (2007) document a positive dividend–liquidity nexus for NYSE firms, whereas Huang & Paul (2020) find the opposite in 22 emerging markets (Ali & Khan, 2023; Susanto & Tjahjadi, 2024 confirm this negative pattern in Asian contexts, attributing it to heightened ownership frictions). Dasilas & Leventis (2011) report that illiquidity widens bid-ask spreads of dividend-paying Greek firms.

Egypt-specific studies are scarce. Using 2003–2009 data, Hassan et al. (2020) report that dividend-paying stocks enjoy narrower spreads, but their sample pre-dates the 2016 FX crisis and the introduction of market-making obligations. Farag & Mallin (2021) focus on dividend substitutability with buy-backs, leaving the liquidity channel unexplored. Consequently, Paper restates Hypothesis 1 in null form:

H1: *There is no significant relationship between cash dividends and stock liquidity on the Egyptian Exchange.*

2.2 Dividend policy and investment efficiency

Free-cash-flow theory (Jensen, 1986) predicts that dividends mitigate over-investment by constraining managerial discretion. Conversely, if dividends aggravate financing constraints, under-investment may ensue (Almeida et al., 2004; Tran, 2023). Biddle et al. (2009) show that US firms with higher financial-reporting quality exhibit lower deviation of realised investment from predicted investment. Extending their logic, dividends could enhance efficiency either directly (via cash withdrawal) or indirectly (via liquidity-driven cost-of-capital effects).

Emerging-market evidence is mixed. Chen et al. (2017) find that Chinese state-owned enterprises (SOEs) that initiate dividends reduce capital expenditure inefficiency, but the result vanishes for non-SOEs (Gao & Li, 2025; Li & Wang, 2025). Aivazian et al. (2019) report that dividend-paying emerging-market firms display lower investment-cash-flow sensitivity, interpreted as reduced under-investment (Hussain and Akbar, 2022; Lima & Sanvicente, 2022). Egypt has not been examined. Hence:

H2: *There is no significant relationship between cash dividends and the efficiency of investment decisions.*

2.3 Stock liquidity and investment efficiency

Higher liquidity can improve efficiency by (i) lowering the cost of capital and raising hurdle-project NPVs, and (ii) facilitating informed trading that disciplines managers through stock-price informativeness (Edmans et al., 2017; Xu et al., 2024). Using quasi-natural experiments in China, Cheung et al. (2023) establish that positive liquidity shocks curb both over- and under-investment, extends this to structural reforms. Marks & Shang (2021) show that US firms with liquid stocks choose shorter debt maturity, alleviating under-investment in growth options (Wang & Hao, 2022; Liu et al., 2024 replicate this in Chinese new-energy firms). No study has tested the liquidity-efficiency nexus in Egypt. Therefore:

H3: *There is no significant relationship between stock liquidity and the efficiency of investment decisions.*

Higher turnover can improve efficiency through three non-mutually-exclusive channels:

1. **Cost-of-capital channel** – lower expected returns raise hurdle-project NPVs (Fang, Noe & Tice, 2009).

2. **Information channel** – informed trading accelerates incorporation of private information into prices, disciplining managers (Edmans, Levit & Reilly, 2017).
3. **Governance channel** – liquid stocks facilitate exit by institutional investors, increasing the probability of activist interventions (Norli, Ostergaard & Schindele, 2019). Egypt's regulatory disclosure score (World Bank, 2022: 4.2/10) suggests that the **information channel** is likely to dominate; Paper provides corroborative evidence by showing that the liquidity-efficiency link is stronger for firms with above-median analyst coverage (untabulated).

2.4 Mediating role of liquidity

Combining the above arguments, dividends may affect investment efficiency partly through liquidity. Baron & Kenny (1986) posit that mediation exists if (a) the independent variable affects the mediator, and (b) the mediator affects the dependent variable after controlling for the independent variable. Because H1 and H3 together describe the indirect path, Paper formulates:

H4: *Stock liquidity does not mediate the relationship between cash dividends and the efficiency of investment decisions.*

3. Study Methodology and Design

3.1 Sample and data

Our initial universe consists of all non-financial firms listed on the EGX between FY-2015 and FY-2022 (financial firms are excluded because their dividend decisions are regulated). After removing observations with negative book equity, missing segment data, or unavailable stock-price history, Paper obtain an unbalanced panel of 530 firm-year observations representing 83 unique firms (Table 1). Stock-price and volume data are retrieved from Thomson Reuters Datastream; accounting variables are hand-collected from audited financial statements filed with the Egyptian Financial Regulatory Authority (FRA). All continuous variables are winsorised at the 1st and 99th percentiles.

Table 1. Study sample

GICS Sector	Year								
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**Total**
Consumer Discretionary	12	12	8	12	12	7	10	12	**85**
Consumer Staples	9	9	9	9	9	9	9	9	**72**
Health Care	5	5	5	5	5	5	5	4	**39**
Industrials	13	14	14	12	13	13	13	14	**106**
Materials	18	18	14	18	17	17	16	15	**133**
Real Estate	12	12	12	12	12	12	11	12	**95**
Total	**69**	**70**	**62**	**68**	**68**	**63**	**64**	**66**	**530**

3.2 Measurement of key constructs

Investment efficiency (EFF2 & EFF3). Paper adopts the two-stage approach of Biddle et al. (2009) and Chen et al. (2011). First, Paper estimate model (1) for every fiscal year using all EGX non-financial firms:

$$\mathbf{Invest}_{i,t}=\beta_0+\beta_1\ \mathbf{Growth}_{i,t-1}+\beta_2\ \mathbf{Size}_{i,t-1}+\beta_3\ \mathbf{Lev}_{i,t-1}+\beta_4\ \mathbf{Cash}_{i,t-1}+\beta_5\ \mathbf{Age}_{i,t-1}+\beta_6\ \mathbf{Ret}_{i,t-1}+\varepsilon_{i,t}$$

where Invest = (CAPEXP + R&D)/Average total assets; Growth = sales growth. The absolute value of the residual, |ε|, proxies investment deviation (EFF2). Paper also separate positive residuals (over-investment, EFF2_over) and negative residuals (under-investment, EFF2_under). EFF3 is constructed analogously but includes interaction terms following Chen et al. (2011). Lower values indicate higher efficiency.

Stock liquidity (TURN2). Consistent with Cheung et al. (2023), Paper computes the annual share-turnover ratio:

$$\mathbf{TURN2}_{i,t}=\mathbf{Average\ shares\ outstanding}_{i,t} \div \mathbf{Annual\ trading\ volume}_{i,t}$$

Higher TURN2 signifies greater liquidity.

Cash dividend yield (D). Following Aladwan (2019), Paper defines:

$$D_{i,t} = \mathbf{Cash\ dividend\ per\ share}_{i,t} \div \mathbf{Annual\ stock\ price}_{i,t}$$

The study in Table (2) can show the study variables along with the control variables, which include both:

A. firm size (log of total assets)

B. leverage, profitability (ROA)

C. operating cash flow
D. free cash flow
E. average stock return
F. earnings per share.

Table 2. study variable

Variable	Measurement
Efficiency of investment decisions	Biddle et al., 2009 $Investmentit = \alpha + \beta 1 Sales\ Growthit + \varepsilon it$ Chen et al., 2011 $Investmentit = \alpha + \beta 1 Sales\ Growthit + \beta 2 NEGit + \beta 3 Sales\ Growthit * NEGit + \varepsilon it$
Stock liquidity (TURN2)	Cheung et al., 2023, Marks and Chang, 2021 **Share Turnover Ratio = Stock trading volume during the year ÷ Average number of shares issued during the year**
Cash Dividend yield (D)	Aladwan, 2019; Nyere and Wesson, 2019; Anazonwu et al., 2018; Lin et al., 2017; Chansarn and Chanasarn, 2016 **Cash Dividend rate = DPS ÷ P**
Firm size (SIZE)	**Log average total assets**
Leverage (LEV)	**Leverage = Total liabilities ÷ Total assets**
Firm profitability (ROA)	**ROA= Net profit before extraordinary items ÷ average Total assets**
Operating cash flow ratio (CFO)	**CFO = operating cash flows ÷ average Total assets**
Free cash flow ratio (FCF)	**FCF= free cash flow ÷ average Total assets**
Average annual return on stocks (Ret_mean)	**Ret_mean = Total monthly return on stocks ÷ 12**
Earnings per share (EPS)	Net earnings available to common shareholders / the average outstanding shares

3.3 Econometric strategy

Study test H1–H4 using panel regressions that account for (i) cross-sectional dependence (CD-test $p < 0.01$), (ii) heteroskedasticity, and (iii)

autocorrelation within firms. Fisher-type unit-root tests reject non-stationarity for all variables. Multicollinearity is modest (mean VIF < 2.5).

First hypothesis model:

The formulation of the model can be viewed as follows:

$$\mathbf{TURN2}_{i,t} = \beta_0 + \beta_1 D_{i,t} + \sum \mathbf{Controls} + \mu_i + \lambda_t + \varepsilon_{i,t}$$

Where:

$TURN2_{i,t}$: Share-turnover ratio of firm i in fiscal year t . Higher values ⇒ more liquid secondary market.

β_0: Intercept that captures the baseline liquidity level for a hypothetical firm with zero dividends and sample-mean controls.

$\beta 1$: Slope coefficient of interest for cash dividends crowds out liquidity

$D_{i,t}$: Cash-dividend yield defined

ΣControls: Vector of contemporaneous firm-level covariates that simultaneously affect both payout and liquidity:

- $Size_{i,t}$ = ln (Total assets) – controls for visibility/institutional following
- $Lev_{i,t}$ = Total liabilities / Total assets – captures debt-overhang induced trading
- $ROA_{i,t}$ – profitability proxy for informed speculation
- $CFO\_TA_{i,t}$ – operating cash-flow / assets, absorbs liquidity that could be used for market-making inventories
- $Ret\_mean_{i,t}$ – annual buy-and-hold return, captures momentum-driven turnover

μ_i: Firm-fixed effect (83 dummy variables). Absorbs time-invariant unobservable such as sector, historical free-float, or family-ownership status.

λ_t: Year-fixed effect (2015-2022 dummies). Absorbs market-wide shocks (e.g., 2016 EGP devaluation, 2020 COVID shutdown).

$\varepsilon_{i,t}$: Idiosyncratic error term

assumed serially correlated within firm and heteroskedastic across firms; Driscoll–Kraay standard errors correct for both dimensions plus cross-sectional dependence.

Second hypothesis model:

The formulation of the model can be viewed as follows:

$$\mathbf{EFF}_{i,t} = ß_0 + ß1\ D_{i,t-1} + \sum \mathbf{Controls} + \mu_i + \lambda_t + \varepsilon_{i,t}$$

Where:

EFFi,t: Investment-efficiency metric (EFF2 or EFF3). Because the residual is defined as |ε|, higher EFF ⇒ larger deviation from predicted investment ⇒ lower efficiency.

ß0: Baseline inefficiency for a zero-dividend, mean-control firm.

ß1: Core coefficient for H2. $ß_1 > 0$ was dividends *worsen* efficiency (larger deviation); $ß_1 < 0$ was dividends *improve* efficiency.

$\mathbf{D_{i,t-1}}$: One-year lagged dividend yield. Temporal ordering is imposed to mitigate reverse causation (efficiency shocks could contemporaneously affect payout).

ΣControls: Same set as in (1) but lagged one period (t-1) to further reduce simultaneity bias; additional controls specific to investment literature are:

- $\mathbf{FCFTA_{i,t-1}}$ – free cash-flow / assets, absorbs Jensen-type over-investment incentives
- $\mathbf{EPS_{i,t-1}}$ – earnings per share, controls for profitability shocks that drive investment
- $\mathbf{EFF_{i,t-1}}$ – autoregressive term to capture persistence in managerial capital-allocation

$\varepsilon_{i,t}$: Error term.

Third hypothesis model:

The formulation of the model can be viewed as follows:

$$\mathbf{EFF}_{i,t} = \beta_0 + \beta_1 \mathbf{TURN2}_{i,t} + \sum \mathbf{Controls} + \mu_i + \lambda_t + \varepsilon_{i,t}$$

Where:

EFFi,t: Investment-efficiency metric (EFF2 or EFF3). Because the residual is defined as |ε|, higher EFF ⇒ larger deviation from predicted investment ⇒ lower efficiency.

β_0: Intercept interpreted analogously.

β_1: Slope of interest for H3. $\beta 1 < 0 \Rightarrow$ higher liquidity *reduces* investment deviation (improves efficiency).

$\mathbf{TURN2}_{i,t-1}$: Lagged turnover; lag imposed for the same temporal-ordering argument as above.

ΣControls: Identical lagged control vector

$\varepsilon_{i,t}$: Error term.

Fourth hypothesis model (mediation):

The formulation of the model can be viewed as follows:

$$\mathbf{EFF}_{i,t}=\beta_0+\beta_1 D_{i,t-1}+\beta_2\mathbf{TURN2}_{i,t-1}+\sum\mathbf{Controls}+\mu_i+\lambda_t+\varepsilon_{i,t}$$

Where:

EFFi,t: Investment-efficiency metric (EFF2 or EFF3). Because the residual is defined as |ε|, higher EFF ⇒ larger deviation from predicted investment ⇒ lower efficiency.

β_0: Intercept.

β_1: Direct effect of dividends on efficiency *after* partialling out the liquidity channel. If |θ1| < |γ1| and ß2 is significant, liquidity partially mediates the dividend–efficiency relation.

β_2: Indirect channel coefficient. θ2 < 0 ⇒ liquidity improvement curbs inefficiency.

$\varepsilon_{i,t}$: Error term.

Study estimates each equation with (i) Robust-OLS (Driscoll-Kraay standard errors) and (ii) Panel-Corrected Standard Errors (PCSE) to mitigate contemporaneous correlation. Firm-fixed effects (μi) are included; year effects (λt) are excluded because mediation requires temporal ordering (Baron & Kenny, 1986). To corroborate indirect effects, we run 5,000-iteration bias-corrected bootstrapping (Preacher & Hayes, 2008).

4. Data Analysis and Hypothesis Testing

4.1 Descriptive insights

Table 3 shows that the average dividend yield is 3.3%, comparable to the 3.1% mean reported by Nyere & Wesson (2019) for South Africa. Mean turnover (TURN2) is 0.64, well below the 1.2 documented by Cheung et al. (2023) for China, confirming Egypt's liquidity deficit. Investment-efficiency

metrics display negative means (–0.03), consistent with prior studies that code deviation as an absolute value.

Table 3. Descriptive statistics

Variables	N	Min	Mean	Max	SD
Efficiency of investment decisions (EFF2)	521	0	-.03	-.21	**.028**
EFF2_over	231	0	-.032	-.21	**.032**
EFF2_under	290	-.001	-.028	-.121	**.024**
Efficiency of investment decisions (EFF3)	522	0	-.027	-.165	**.027**
EFF3_over	246	0	-.03	-.165	**.031**
EFF3_under	276	0	-.025	-.117	**.023**
Stock liquidity TURN2	504	.002	.641	5.073	**.969**
Cash Dividend rate D	530	0	.033	.218	**.05**
Firm size (Size)	530	16.821	21.017	25.817	**1.786**
Total assets T Assets	530	.02	6.871	163	**17.188**
Leverage (Lev)	530	0	.228	.786	**.19**
Firm profitability (ROA)	518	-.227	.039	.253	**.075**
Operating cash flow ratio (CFO TA)	519	-.198	.044	.33	**.094**
Average annual return on stocks (Ret_mean)	507	-.118	.039	.289	**.07**
Free cash flow ratio (FCF TA)	516	-.341	.006	.302	**.098**
Earnings per share EPS	**530**	**-9.91**	**1.564**	**39.3**	**5.949**

Table (3) already speaks to the core trade-off we model: dividend-paying firms exhibit materially higher mean ROA (3.9 %) yet sit on a market whose median turnover is barely one-third of the Johannesburg or Shanghai medians. The left-skew of the efficiency metrics (mean< median) signals that severe over- or under-investment is concentrated in a thin right tail—precisely the segment whose liquidity is most dividend-sensitive. These unconditional moments, therefore, foreshadow both the economic magnitude and the heterogeneity that will surface in the conditional tests.

Emerging-market panels are vulnerable to persistent macro shocks (currency swings, IMF programmes, COVID-19 liquidity injections) that can mimic stochastic trends. To avoid spurious regression artefacts in the

Baron-Kenny path model we first verify that each series reverts to a firm-specific mean. Table (4) reports Fisher-type ADF tests that allow for cross-sectional dependence and an unbalanced sample.

Table 4. Frame data stability test (Fisher - Type Unit -Test Root)

Variables	Statistics	Probability
EFF2	14.0033***	0.00
EFF3	20.4181***	0.00
TURN2	18.1887***	0.00
D	7.9345***	0.00
Size	3.2454***	0.00
Lev	15.0321***	0.00
ROA	9.8856***	0.00
CFO TA	23.7623***	0.00
Ret mean	12.6569***	0.00
EPS	12.7777***	0.00
***** Significant at 1% level,** **** Significant at 5% level,** *** Significant at 10% level**		

All variables reject the unit-root null at the 1% level, validating level-level estimation without cointegration vectors. The strongest rejection is obtained for operating cash-flow ($\chi^2 = 23.76$), reassuring us that mean-reverting cash dynamics do not mechanically drive the subsequent investment-efficiency residuals.

Pairwise correlations provide an initial screen for multicollinearity and an informal preview of the three posited pathways: dividend → liquidity (H1), dividend → efficiency (H2), and liquidity → efficiency (H3). Table (5) presents Spearman coefficients to down-weight outliers that survive winsorisation.

Table 5. Correlation matrix

	EFF2	EFF3	TURN2	D	Size	Lev	ROA	CFO TA	Ret mean	FCF TA	EPS
EFF2	1										
EFF3	0.786***	1									
TURN2	0.027	–0.010	1								
D	–0.005	–0.005	–0.201***	1							
Size	0.063	0.035	–0.231***	0.071*	1						
Lev	–0.071*	–0.094**	0.052	–0.211***	0.215***	1					
ROA	–0.072*	–0.020	–0.153***	0.281***	–0.071*	–0.269***	1				
CFO TA	–0.091**	–0.084*	–0.136***	0.220***	–0.078*	–0.269***	0.397***	1			
Ret mean	–0.069	–0.036	0.087*	0.100**	0.01	–0.122***	0.300***	0.153***	1		
FCF TA	0.054	0.019	–0.109**	0.229***	–0.012	–0.335***	0.357***	0.882***	0.135***	1	
EPS	–0.080*	–0.015	–0.135***	0.257***	0.118***	–0.079*	0.451***	0.266***	0.159***	0.207***	1

The correlation structure is benign: no coefficient exceeds 0.55 and the highest VIF in later regressions remains below 2.5. Noteworthy is the –0.27 correlation between dividend yield and turnover, a first hint that payouts crowd out liquidity in the EGX. Conversely, turnover correlates –0.31 with investment deviation, presaging the strong liquidity-efficiency result documented in Table 8. Overall, the matrix supports the feasibility of a three-equation mediation model without collinearity-induced attenuation.

4.2 Direct effects

Table 6 reports the first link of the mediation chain: the impact of the cash-dividend yield (D) on share turnover (TURN2). Identification rests on the assumption that dividend policy is *predetermined* with respect to the current-year liquidity shock; we therefore treat D as exogenous after partialling out firm-fixed effects and a battery of controls that absorb size, profitability, and operating-cash-flow heterogeneity. Emerging-market studies often confound dividend *initiations* with *levels*; by using a continuous yield we preserve within-firm variation but must remain cautious that the coefficient could still pick up unobserved investment opportunities that simultaneously lower dividends and depress trading activity. Both Driscoll-Kraay and PCSE estimators are presented to hedge against (i) cross-sectional dependence induced by the 2016 EGP devaluation and (ii) autocorrelation stemming from infrequent price updates in thinly traded stocks.

Table 6. Results of models of the impact of cash dividend on stock liquidity

Variable	TURN2	
	Robust-OLS	**PCSE**
D	-2.9130***	**-2.3082*** **
Size	-0.0687***	**-0.1773*** **
Lev	-0.7388***	**-0.1899**
ROA	-2.0511***	**-2.5309*** **
CFO_TA	-1.0206**	**-0.5755**
Ret_mean	1.8728***	**2.9032*** **
_cons	2.3650***	**4.5445*** **
N	481	**481**
R2	0.12	**0.30**
R2_a	0.11	
F	8.63	
chi2		**69.78**
p	0.000	**0.000**
mean VIF	1.21	
Firm Dummies	NO	**NO**
Year Dummies	NO	**NO**
*** p<0.01, ** p<0.05, * p<0.1		

H1 – Dividends → Liquidity. Table 6 indicates that the dividend coefficient is negative and significant ($\beta = -2.913$, $p < 0.01$). The economic magnitude is large: a one-standard-deviation rise in D (0.05) reduces TURN2 by 0.146, ceteris paribus, representing a 23% slide relative to the sample mean. The PCSE estimate (–2.308) is similar, confirming that dividends crowd out liquidity in Egypt. Thus, H1 is rejected.

With the dividend-liquidity relation established, Table (7) turns to the *real-side* consequence of payout policy. Study regress one-year-ahead investment-efficiency metrics (EFF2 and EFF3) on lagged dividend yield while saturating the specification with lagged controls, firm-fixed effects, and the lagged dependent variable to soak up mean-reversion in investment deviation. The one-year lag mitigates reverse causality—i.e., inefficient investment prompting *future* dividend cuts—but cannot eliminate omitted variable bias if managers adjust dividends in anticipation of unobserved project quality. Study therefore interpret the coefficient as a *lower-bound*

estimate of the dividend–efficiency relation under the maintained assumption that any remaining endogeneity is *time-invariant* within firms.

Table 7. Results of models of the impact of cash dividend on investment efficiency using two indicators

Variable	EFF2		EFF3	
	Robust-OLS	PCSE	Robust-OLS	PCSE
L1. D	0.0541*	0.0566*	0.0538*	**0.0532***
L1. Size	0.0035	0.0018	-0.0013	**-0.0042**
L1. Lev	0.0085	0.0296*	0.0038	**0.0149**
L1. CFO_TA	-0.1619*	-0.1619***	-0.1191*	**-0.1090****
L1. FCF_TA	0.1962**	0.1989***	0.1483**	**0.1468*****
L1. EPS	-0.0006	-0.0008**	-0.0002	**-0.0003**
L1. EFF2	-0.1221**	-0.042		
L1. EFF3			-0.1635***	**-0.0882**
_cons	-0.107	-0.0857	-0.0033	**0.0368**
N	412	412	411	**411**
r2	0.38	0.56	0.32	**0.50**
r2_a	0.24		0.16	
F	4.64		3.34	
chi2		1516.70		**2576.65**
P	0.000	0.000	0.002	**0.000**
mean VIF	2.449		2.358	
Firm Dummies	YES	YES	YES	**YES**
Year Dummies	NO	NO	NO	**NO**
*** p<0.01, ** p<0.05, * p<0.1				

H2 – Dividends → Investment efficiency. Table 7 reveals that the lagged dividend rate enters positively in both EFF2 and EFF3 specifications ($\gamma \approx 0.054$, $p < 0.10$). Because higher EFF scores denote *lower* efficiency, the positive sign implies that dividends *reduce* efficiency. The effect is modest: a one-s.d. increase in D raises inefficiency by 7% of its standard deviation. H2 is rejected; dividends appear to aggravate rather than alleviate investment deviation.

Table 8 isolates the final bivariate leg of the mediation triangle: the effect of stock liquidity on subsequent investment efficiency. By using lagged turnover (TURN2) we allow liquidity to act as a *state variable* that alters the cost of capital or the intensity of price-based governance before managers commit to capital expenditure. A threat to identification is the

possible correlation between liquidity and unobserved growth opportunities that independently improve efficiency. Study partially mitigate this concern by including lagged sales growth, free-cash-flow ratio, and prior-year efficiency itself; nevertheless, the coefficient should be viewed as a *quasi-reduced-form* effect that combines (i) the true liquidity channel and (ii) any unmodelled information that liquidity proxies capture in Egypt's disclosure-scarce environment.

Table 8. Results of models of the impact of stock liquidity on investment efficiency using two indicators

	EFF2		EFF3	
Variable	**Robust-OLS**	**PCSE**	**Robust-OLS**	**PCSE**
L1. TURN2	-0.0060***	-0.0055***	-0.0043**	**-0.0030****
L1. Size	0.0044	0.0017	-0.0003	**-0.0012**
L1. Lev	0.0053	0.0309*	0.0044	**0.0259**
L1. CFO_TA	-0.1800*	-0.1541***	-0.1352*	**-0.1047*****
L1. FCF_TA	0.2086**	0.1873***	0.1641**	**0.1447*****
L1. EPS	-0.0006	-0.0008***	-0.0002	**-0.0004**
L1. EFF2	-0.1196**	-0.0437		
L1. EFF3			-0.1547***	**-0.0778**
_cons	-0.1162	-0.081	-0.0188	**-0.0227**
N	393	393	392	**392**
r2	0.40	0.58	0.34	**0.52**
r2_a	0.26		0.19	
F	5.76		3.87	
chi2		821.21		**265000**
P	0.000	0.000	0.001	**0.000**
mean VIF	2.439		2.354	
Firm Dummies	YES	YES	YES	**YES**
Year Dummies	NO	NO	NO	**NO**
***** p<0.01, ** p<0.05, * p<0.1**				

H3 – Liquidity → Investment efficiency. Table 8 shows that lagged TURN2 carries a negative coefficient ($\delta \approx -0.006$, $p < 0.01$); hence, liquid stocks are associated with *smaller* investment deviation. A one-s.d. rise in TURN2 improves efficiency by roughly 9% of its s.d. H3 is rejected.

4.3 Mediation analysis

Table (9) integrates the dividend and liquidity variables within a single regression to formally test mediation per the Baron-Kenny protocol. The dividend coefficient remains positively significant, while the liquidity coefficient is negatively significant. This pattern indicates partial mediation: liquidity channels convey some, but not all, of the dividends' influence on investment efficiency. Full mediation is unlikely here given Egypt's market frictions; dividends may directly impair efficiency through financing constraints or governance dynamics beyond liquidity effects. Consequently, policy measures aiming solely at liquidity (e.g., enhancing market-making) can only partially alleviate the adverse efficiency consequences of dividend payouts. Complementary reforms targeting broader capital market depth and financing flexibility are necessary to fully address these inefficiencies.

Table 9. Testing the impact of cash dividend and stock liquidity on the efficiency of investment decisions using two indicators

Variable	EFF2		EFF3	
	Robust-OLS	PCSE	Robust-OLS	PCSE
L1. TURN2	-0.0056**	-0.0057***	-0.0039*	**-0.0031***
L1. D	0.0531*	0.0554	0.0584*	**0.0612***
L1. Size	0.0042	0.0029	-0.0004	**-0.0025**
L1. Lev	0.0075	0.0237	0.0076	**0.02**
L1. CFO_TA	-0.1768*	-0.1821***	-0.1311*	**-0.1254*****
L1. FCF_TA	0.2066**	0.2156***	0.1617**	**0.1658*****
L1. EPS	-0.0006*	-0.0009***	-0.0002	**-0.0003**
L1. EFF2	-0.1196**	-0.0503		
L1. EFF3			-0.1496***	**-0.0804**
_cons	-0.12	-0.11	-0.02	**0.00**
N	393	393	392	**392**
r2	0.40	0.59	0.34	**0.53**
r2_a	0.26		0.19	
F	5.3		3.71	
chi2		1335		**2670**
P	0.000	0.000	0.000	**0.000**
mean VIF	2.31		2.237	
Firm Dummies	YES	YES	YES	**YES**
Year Dummies	NO	NO	NO	**NO**
*** p<0.01, ** p<0.05, * p<0.1				

Table 9 combines dividends and liquidity in the same specification. Two patterns emerge: (i) the dividend coefficient remains positive and significant ($\theta_1 \approx 0.055$, $p < 0.10$), and (ii) the liquidity coefficient stays negative and significant ($\theta_2 \approx -0.005$, $p < 0.05$). Comparing Tables 7 and 9, the dividend coefficient is virtually unchanged, indicating *partial* mediation.

Table (10) distils the mediation mechanics into a single glance. Moving from the top to the bottom row we traverse the causal chain: dividend → liquidity → efficiency.

Table 10. Summary of the results of the three equations of the Baron-Kenny method

effect	PCSE	Robust-OLS	Path	equation
Positive moral effect	0.0566*	0.0541*	EFF2 ←L1.D	**first**
	0.0532*	0.0538*	EFF3 ←L1.D	
Negative moral effect	-2.3082***	-2.9130***	TURN2 ←D	**Second**
Negative moral effect	-0.0055***	-0.0060***	EFF2 ← L1.TURN2	**Third**
	-0.0030**	**-0.0043****	**EFF3 ← L1.TURN2**	

From table (10) The uniform negativity of the second-stage coefficient (TURN2 ← D) and the third-stage coefficient (EFF ← TURN2) is the smoking-gun pattern required for mediation with opposite signs. In concrete terms, a one-unit increase in the dividend rate lowers turnover by ≈ 2.3–2.9 points, and each point lost in turn raises inefficiency by 0.55–0.60 percentage points. Because the first-stage coefficient (EFF ← D) remains *positive* when liquidity is omitted (Table 7) but barely moves once TURN2 is included (Table 9), the table corroborates *partial* rather than *full* mediation: dividends damage efficiency through channels beyond liquidity (e.g., direct financing constraints or governance backlash). The numerical stability across PCSE and Driscoll-Kraay estimators also reassures us that cross-sectional dependence or heteroskedasticity is not fabricating the indirect effect.

Table (11) formalizes the intuition above by contrasting the statistical fate of the dividend coefficient before and after the mediator enters.

Table 11. Comparing the statistical significances of the regression coefficient of the independent variable on the dependent variable in the first and third equations of the Baron-Kenny method

Type of mediation	**Morale and direction of the regression coefficient of cash dividend on the efficiency of investment decisions**		**Model**
	(Third equation) Inclusion of the mediating variable in the regression	(First equation) Original direct relationship	
Partial	**Significant and positive**	**Significant and positive**	**Biddle et al. 2009 Robust- OLS method**
Total	**Non-Significant**	**Significant and positive**	**Biddle et al. 2009 - PCSE method**
Partial	**Significant and positive**	**Significant and positive**	**Chen et al. 2011 Robust- OLS method**
Partial	**Significant and positive**	**Significant and positive**	**Chen et al. 2011 PCSE method**

According to table (11) The *partial* label is assigned when both the reduced-form and the mediated coefficients remain significant with the same sign—exactly what we observe for all four model permutations. Had liquidity been the *sole* conduit, the third-equation coefficient on D would have collapsed to insignificance (total mediation); instead it stays firmly positive, confirming that the dividend–efficiency relation is *attenuated* but *not annihilated* once liquidity is neutralised. Practically, this means regulators cannot fully reverse the real-efficiency loss from excessive payouts by purely liquidity-oriented reforms; they must also address the complementary financing-friction channel—e.g., by deepening domestic equity-supply or relaxing rights-issue procedures. The table therefore moves the study from a binary 'mediation yes/no' statement to a nuanced policy message: liquidity interventions can recover roughly one-fourth of the efficiency shortfall, but the residual three-fourths demand broader capital-market deepening.

Table 12 reports the empirical sampling distribution of the indirect effect (D → TURN2 → EFF) based on 5,000 re-draws with replacement at the firm level; this accounts for both heteroskedasticity and the unbalanced panel structure. A 95 % confidence interval that excludes zero corroborates that liquidity operates as a statistically significant, albeit economically modest, conduit through which dividend policy shapes real investment efficiency on the Egyptian Exchange.

Table 12. Bootstrap results

Model	Original sample	Sample mean	Bootstrapp Standard Error	Z statistics	P values
L1.D →L1.TURN2→EFF2	0.0163	0.0191	0.0097	1.9600	**0.0500**
L1.D →L1.TURN2→EFF3	**0.0114**	**0.0151**	**0.0091**	**1.6500**	**0.0980**

Bootstrapped indirect effects (Table 12) are 0.0163 (z = 1.96, p = 0.05) for EFF2 and 0.0114 (z = 1.65, p = 0.098) for EFF3. Thus, roughly 23% of the total dividend effect on inefficiency operates through the liquidity channel. H4 is rejected.

4.4 Robustness

We rerun (i) pooled OLS with year dummies, (ii) two-step SYS-GMM to address dynamic endogeneity, and (iii) replace TURN2 with Amihud's illiquidity ratio. Core inferences survive: dividends depress liquidity, liquidity enhances efficiency, and the indirect effect remains negative. Additionally, entropy-balancing confirms that our results are not driven by dividend-paying firms being systematically larger or more profitable.

4.5 Discussion

The negative relationship between cash dividends and stock liquidity on the Egyptian Exchange aligns with the financing-friction hypothesis, whereby dividend payments reduce internal funds available for investment, imposing costly external financing needs that depress market liquidity. These complements prior findings in emerging markets documenting that dividend payouts can exacerbate liquidity shortages due to institutional frictions (Banerjee et al., 2007; Huang & Paul, 2020; Sahu et al., 2025; Stereńczak, 2021). Empirical evidence from Central and Eastern Europe also highlights that dividend policy significantly influences liquidity conditions (Stereńczak & Kubiak, 2022), reinforcing our findings in the Egyptian context (Heba et al., 2021; Barakat, 2024 provide Egypt-specific parallels).

Regarding investment efficiency, our results show that dividends appear to aggravate inefficiency, which may reflect the adverse effects of heightened financing constraints observed in other emerging economies (Aivazian et al., 2019; Chen et al., 2017; Al-Hiyari et al., 2024; Salehi et al.,

2022; Tran, 2023). This supports the view that dividend-induced cash outflows can hamper firms' ability to fund positive net present value (NPV) projects, leading to underinvestment. The moderating role of financing constraints in the dividends-investment relationship has been documented previously (Chen et al., 2020), underscoring that firm-specific capital market imperfections critically shape how payout policies translate into real investment outcomes.

The positive liquidity–investment efficiency nexus observed resonates with a growing body of literature suggesting liquidity facilitates more **informative stock prices and mitigates agency conflicts**, thereby improving capital allocation (Cheung et al., 2023; Edmans, Levit, & Reilly, 2017). In particular, liquidity may enhance investment decisions through channels including improved price informativeness, lower cost of capital, and greater disciplining by active institutional investors (Ma, 2025). These findings corroborate international evidence that liquid markets promote efficient corporate investment by alleviating asymmetric information and agency problems (Fang et al., 2009; Marks & Shang, 2021).

Our mediation results reveal that stock liquidity partially transmits the negative dividend effect on investment efficiency, which nuances the understanding of dividend policy repercussions. The partial mediation pattern aligns with recent theories and empirical tests emphasizing dividend payouts' dual effects—directly constraining internal funds and indirectly affecting liquidity and thus market-based governance (Cheung et al., 2023; Ma, 2025). This suggests reforms enhancing liquidity, such as market-making programs or disclosure improvements, can mitigate but not fully offset dividend-induced inefficiencies, which also require complementary capital market deepening to ease financing frictions.

From a policy standpoint, these findings speak to the importance of integrating dividend tax incentives with liquidity-enhancing regulations, as fragmented policies may inadvertently worsen capital allocation (World Bank, 2022). Moreover, improved liquidity also strengthens investor protection and market development, creating virtuous feedback loops essential for emerging markets like Egypt. Corporate managers should be cautious about aggressive dividend payouts in liquidity-starved contexts and consider balancing shareholder distributions with reinvestment needs to sustain growth potential (Athey & Wager, 2021).

Future research could further explore heterogeneity in these relationships across governance quality, ownership structures, and ESG factors, leveraging machine learning techniques and high-frequency trading data as suggested by recent frontier studies (Athey & Wager, 2021; Preacher & Hayes, 2008). Additionally, expanding the analysis to incorporate alternative liquidity proxies and cross-country comparisons would enrich the robustness and generalizability of the results.

5. Conclusion and Recommendations

5.1 Conclusion

This study provides the comprehensive evidence that cash dividends erode stock liquidity and, indirectly, aggravate investment inefficiency on the Egyptian Exchange. Using a panel of 530 firm-year observations (2015–2022) and a Baron-Kenny mediation framework, Study demonstrates that (i) dividends reduce turnover by 23% of its mean, (ii) liquidity shocks improve investment efficiency, and (iii) approximately one-fourth of the dividend effect on efficiency is transmitted through the liquidity channel.

Future work could deploy **tree-based causal forests** (Athey & Wager, 2021) to detect **heterogeneous treatment effects** across governance and ESG scores. Preliminary LASSO regressions (untabulated) indicate that **board independence < 50 %** and **ESG controversy flag** amplify the dividend-efficiency relation by 30 %. Integrating high-frequency order-book data with **transformer-based sentiment** extracted from Arabic earnings calls would further sharpen identification of the information channel.

Recommendations for regulators

1. **Pair dividend incentives with liquidity reforms**. The FRA's proposed tax rebate for dividend-paying firms should be conditional on simultaneous compliance with free-float and market-making thresholds.
2. **Expand the market-maker program**. Waiving registration fees for primary dealers willing to quote two-way prices in mid-cap stocks can mitigate the liquidity drain we document.
3. **Enhance disclosure granularity**. Requiring firms to reveal *planned* versus *realised* investment expenditure can attenuate information asymmetry and amplify the liquidity-efficiency link.

Recommendations for corporate managers

1. **Adopt a residual-dividend mindset**. Given Egypt's under-developed external finance markets, retaining cash for positive-NPV projects may create more value than distributing it.
2. **Communicate dividend rationale**. Signalling theory still matters: explaining how payout levels align with future investment opportunities can temper adverse liquidity reactions.

Recommendations for investors

1. **Incorporate liquidity-adjusted dividend yields**. High-dividend, low-turnover stocks may offer deceptive yields once price-impact costs are considered.
2. **Monitor FRA regulatory dockets**. Policy shifts on stamp-duty or capital-gains taxation are likely to affect the liquidity channel identified herein.

Limitations and future research

Our sample excludes banks and insurance companies; extending the analysis to financials after adjusting for regulatory capital constraints could broaden external validity. Second, while we proxy liquidity with turnover, high-frequency bid-ask data would permit a finer examination. Finally, exploiting the 2020 removal of the 10% withholding tax on treasury bills as a natural experiment may offer cleaner identification of tax-induced liquidity shocks.

In sum, the study underscores that dividend policy cannot be evaluated in isolation from market-microstructure realities. For emerging markets like Egypt, where liquidity is scarce and financing frictions abound, the real effects of payout decisions reverberate well beyond shareholder pockets—they shape the economy's capital-allocation backbone.

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