DOES ESG PERFORMANCE REDUCE CORPORATE CASH HOLDINGS? EVIDENCE FROM PANEL FIXED EFFECTS MODELS

An Nissa Regita Febriana[1,*)], Evi Gantyowati[2)]

[1)]*Sebelas Maret University, Indonesia*

[2)]*Sebelas Maret University, Indonesia*

*e-mail: nissaregita02@student.uns.ac.id
evigantyowati_fe@staff.uns.ac.id

ABSTRACT

This study investigates the impact of Environmental, Social, and Governance (ESG) performance on corporate cash holding policies in an emerging market setting. Using panel data from 833 non-financial firms listed in Indonesia over the period 2021–2024 (3,327 firm-year observations), this research applies panel fixed effects estimation following Chow, LM, and Hausman tests. The results reveal that ESG performance is negatively and significantly associated with corporate cash holdings. The findings suggest that firms with stronger ESG performance tend to hold lower levels of cash, supporting the agency theory argument that ESG acts as an external governance mechanism that constrains managerial discretion and reduces excess liquidity accumulation. The study contributes to the literature by providing emerging market evidence and highlighting ESG as a determinant of corporate liquidity policy. The results are robust after controlling for firm size, leverage, tax aggressiveness, and profitability.

Keywords: ESG, Cash Holding, Corporate Governance, Agency Theory, Emerging Market, Panel Data

1. INTRODUCTION

Cash serves several important roles in a company. It is used for daily transactions, as a reserve to deal with uncertainty, and as an internal source of financing Von Kalckreuth et al., (2014). Because of this, cash holding policy is considered a key financial decision. It directly affects a firm's liquidity, financial flexibility, and long-term sustainability. According to Wang et al., (2024), managing cash at an optimal level allows firms to operate smoothly and supports better managerial decision-making. This becomes especially critical during economic downturns or financial crises, where liquidity can determine whether a company survives (Nguyen et al., 2023). Firms with higher cash reserves are generally better able to overcome financial constraints and take advantage of investment opportunities when they arise Yung et al., (2015). Financial flexibility also reduces a firm's dependence on internal cash flow, enabling continued investment even in difficult economic conditions (Ahrends et al., 2018). In addition, Im et al., (2022) show that higher stock liquidity may lead firms to hold more cash, particularly when they expect strong growth opportunities.

However, holding too much cash can create agency problems. Managers may use excess cash for inefficient investments or for personal interests. Previous studies Hendrawaty., (2019) dan Hyunjung., (2024) suggest that cash holding decisions are influenced by various internal factors, including firm characteristics, financial structure, tax policy, profitability, and sustainability

practices (ESG). Larger firms tend to hold less cash because they have better access to capital markets and more diversified income streams Chireka & Fakoya, (2017) dan Jebran et al., (2019). Firms with higher capital expenditures also tend to hold less cash because they allocate more funds to long-term assets Chireka & Fakoya, (2017) dan Soetanto & Proboyo, (2024). Meanwhile, firms with stronger internal cash flows are more responsive to investment opportunities, which affects their cash policies (Zhi, 2009). Tax policy also plays a role, as higher subsidiary tax rates can increase leverage and indirectly influence cash holdings (Miniaci & Panteghini, 2025).

In recent years, attention to Environmental, Social, and Governance (ESG) practices has grown significantly. ESG is no longer viewed only as a sustainability issue but also as an indicator of corporate governance quality. Suyono et al., (2026) argue that better ESG disclosure is associated with stronger internal audit quality, greater transparency, and higher stakeholder trust. ESG practices help reduce information asymmetry between firms and stakeholders by providing more comprehensive and detailed disclosures (Sivanandan, 2024; Suyono et al., 2026). Although many studies suggest that ESG reduces information asymmetry and improves external monitoring, its relationship with cash holding remains mixed. Some studies find that better ESG performance is associated with lower cash holdings, as ESG reduces agency conflicts, information asymmetry, and default risk (Saleh et al., 2025; Tekin & Burgazoglu, 2022). For example, in BRICS countries, a one-unit increase in ESG performance reduces cash holdings by about 1.2% (Chen et al., 2025). Similarly, European firms with higher ESG disclosure tend to hold less cash Saleh et al., (2025). On the other hand, some studies find a positive relationship. Firms with strong ESG performance may hold more cash as a precaution against uncertainty and potential risks Marie et al., (2025) dan Yuan et al., (2025). During periods of high economic policy uncertainty, firms involved in ESG controversies may also increase cash reserves as a protective measure (Al-Dhamari et al., 2026).

This study examines whether ESG performance influences corporate cash holding decisions in Indonesia. Indonesia is chosen because it is a developing country with concentrated ownership structures and evolving governance standards. These conditions differ from developed countries, suggesting that ESG may play a more important role in reducing agency problems. This study offers three main contributions. First, it extends the literature by focusing on cash holding decisions rather than investment or capital structure. Second, it provides evidence from a developing country context, which is still limited in ESG research. Third, it applies panel data analysis using a fixed effects approach to control for firm-specific differences, improving the accuracy of the results.

2. LITERATURE REVIEW

2.1 *Agency Theory* dan *Cash Holding*

Agency theory Jensen & Meckling, (1976) explains the relationship between owners (principals) and managers (agents). Conflicts may arise because managers do not always act in the best interests of shareholders. These conflicts can lead managers to hold excessive cash for personal or inefficient purposes. This issue becomes more relevant when firms generate high internal cash flows. Excess cash can encourage overinvestment or misuse of resources. M. C. Jensen, (1986) explains that managers prefer controlling internal funds because it reduces external

monitoring by investors and creditors. Corporate governance mechanisms are therefore important in limiting opportunistic behavior. Effective governance encourages efficient cash management and helps maintain optimal cash levels. It also improves transparency and reduces the negative impact of managerial opportunism (Hsu & Yang, 2022). Weak governance, on the other hand, can result in excessive cash holding and lower firm value. Thus, agency theory provides a strong foundation for understanding how governance affects cash holding decisions.

2.2 ESG as a Governance Mechanism

Environmental, Social, and Governance (ESG) has become increasingly important in corporate finance literature. ESG reflects the quality of governance, transparency, and corporate responsibility toward stakeholders. It also shows how firms build accountable relationships with investors and external parties (Gillan et al., 2021). From an agency theory perspective, conflicts arise due to differences in goals and information gaps between managers and shareholders (M. C. Jensen & Meckling, 1976). This can lead to inefficient cash retention. High free cash flow increases the risk of resource misuse (M. C. Jensen, 1986).

In this context, ESG acts as a governance mechanism that helps reduce these conflicts. Firms with strong ESG performance tend to provide more transparent and comprehensive disclosures. This reduces information asymmetry and strengthens stakeholder trust (Dhaliwal et al., 2011). Such firms are also subject to greater scrutiny from investors and financial analysts. Empirical studies show that firms with strong ESG performance tend to have lower risk and better access to financing. They often face lower capital costs and enjoy higher investor confidence (Albuquerque et al., 2019; El Ghoul et al., 2011). As a result, they rely less on internal cash reserves. Based on this reasoning, the hypothesis is ESG has a negative effect on cash holding.

3. RESEARCH METHODOLOGY

3.1 Research Design

This study uses a quantitative approach with panel data analysis. This method captures both cross-sectional and time-series variations, leading to more reliable estimates.

3.2 Population and Sample

The population includes all firms listed on the Indonesia Stock Exchange from 2021 to 2024. The sample focuses on non-financial firms due to their different financial structures and regulations. The final dataset consists of 3,327 firm-year observations from 833 companies.

Table 1. Operational Variables

Variable	Type	Operational Definition	Indicator	Reference
Cash Holding (CH)	Dependent	Cash holding refers to the level of cash and cash equivalents held by a firm to meet operational needs and serve as a	Cash and cash equivalents divided by total assets	Ozkan & Ozkan, (2004)

		liquidity buffer in times of uncertainty.		
Environmental, Social, and Governance (ESG)	Independent	ESG reflects a firm's performance in environmental, social, and governance aspects, indicating its commitment to sustainability practices and responsibility toward stakeholders.	ESG score	Ferrell et al., (2016)
Firm Size (SIZE)	Control	Firm size represents the scale of a company and reflects the magnitude of resources owned by the firm.	Ln (Total Assets)	Elshandidy et al., (2013)
Leverage (LEV)	Control	Leverage measures the extent to which a company uses debt to finance its assets.	Total debt divided by total assets	Ozkan & Ozkan, (2004)
Effective Tax Rate (ETR)	Control	The effective tax rate indicates the proportion of tax paid by a firm relative to its pre-tax income.	Tax expense divided by pre-tax income	Abernathy et al., (2017)
Return on Assets (ROA)	Control	ROA measures a firm's ability to generate profit from its total assets.	Net income divided by total assets	Laique et al., (2023)
EBIT Margin (EBITM)	Control	EBIT margin reflects a firm's operating profitability before interest and taxes relative to its sales.	EBIT divided by sales	Akgün & Memiş Karataş, (2020)

3.3 Data Collection and Analysis

This study uses secondary data collected through documentation and literature review. Panel regression analysis is applied using EViews software.

Table 2. Panel Regression Results

Model Test	Statistic	p-value	Decision
Chow Test	6.329222	0.0000	Fixed Effect Model
LM Test	1613.799	0.0000	Random Effect Model
Hausman Test	18.932445	0.0043	Fixed Effect Model

Model selection is conducted using the Chow test, Lagrange Multiplier (LM) test, and Hausman test. The Fixed Effect Model (FEM) is selected as the best model. The regression model is:

$$CH_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ETR_{it} + \beta_5 ROA_{it} + \beta_6 EBITM_{it} + \alpha_i + u_{it}$$

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Descriptive statistics are used to provide a general overview of the research data, including the number of observations, mean values, maximum and minimum values, and the level of data dispersion (standard deviation) for each variable. In this study, ESG is treated as the independent variable, cash holding as the dependent variable, and SIZE, LEV, ETR, ROA, and EBITM as control variables. The descriptive results for each variable are presented as follows.

Table 3. Descriptive Statistic Results

Variable	Obs	Mean	Median	Max	Min	Std. Dev
CH	3327	0.0930	0.0525	1.2402	-0.0005	0.1150
ESG	3327	4.4069	0.0000	89.0200	0.0000	15.1468
SIZE	3327	27.1233	27.7307	33.7899	-0.0378	4.9591
LEV	3327	1.9984	0.4526	3191.120	0.0000	55.9819
ETR	3327	0.3485	0.2488	353.3218	-118.2195	2.9851
ROA	3327	0.6854	0.0285	3612.443	-1391.151	67.1203
EBITM	3327	-0.4216	0.0779	32.4512	-1608.070	32.7551

The analysis of 3,327 observations reveals several important insights into the characteristics of the data. First, the average value of cash holding (CH) is 0.0930, indicating that firms, on average, hold approximately 9.3% of their total assets in cash. The minimum value, which is close to zero (-0.0005), and the maximum value of 1.2402 suggest variation in cash holding policies across firms, although the overall dispersion remains relatively low (standard deviation of 0.1150).

The average ESG score is 4.4069, with a median of 0.0000, indicating that most firms have relatively low or uneven ESG performance. However, the high maximum value (89.0200) suggests that a number of firms demonstrate very strong ESG performance, resulting in substantial variability (standard deviation of 15.1468). Firm size (SIZE) has an average value of 27.1233, indicating that most firms in the sample are relatively large. The range from -0.0378 to 33.7899 reflects considerable differences in firm size, supported by a standard deviation of 4.9591. Leverage (LEV) has an average value of 1.9984, suggesting that firms tend to rely significantly on debt financing. The extremely high maximum value (3191.120) compared to the minimum value (0) indicates substantial variation in capital structures across firms, as reflected in the high standard deviation (55.9819).

The effective tax rate (ETR) has an average of 0.3485, meaning that firms pay approximately 34.85% of their pre-tax income as taxes on average. However, the very wide range, from -118.2195 to 353.3218, indicates irregularities in tax payments, which may be due to differences in financial conditions such as tax losses or tax planning strategies. Profitability, measured by ROA, has an average value of 0.6854, suggesting that firms are generally able to generate profits from their assets. However, the extremely wide range, from -1391.151 to 3612.443, reflects substantial variation in firm performance, from very poor to exceptionally high. Finally, EBITM has a negative average value of -0.4216, indicating that, on average, firms experience low or even negative operating profit margins. The wide range, from -1608.070 to

32.4512, further highlights significant variation in operational performance across firms. Overall, the descriptive statistics indicate considerable variability in most variables, particularly LEV, ETR, ROA, and EBITM, suggesting substantial differences in firm characteristics within the sample.

4.2 Panel Regression Model Selection

The selection of the panel regression model was conducted through three tests: the Chow test, the Lagrange Multiplier (LM) test, and the Hausman test. Based on these tests, the Fixed Effect Model (FEM) was selected as the most appropriate model.

Table 4. Hypothesis Testing Results

Variable	Obs	Cash Holding		
		Coefficient	t-statistic	p-value.
C	3327	0.173760***	16.00315	0.0000
ESG		-0.000313***	-2.746399	0.0061
SIZE		-0.002925***	-7.306583	0.0000
LEV		-1.63E-05**	-2.040894	0.0414
ETR		-0.000170**	-2.432966	0.0150
ROA		2.95E-05	0.460339	0.6453
EBITM		5.25E-06	1.190965	0.2338
R-Squared		0.9675		
Adj. R-squared		0.9566		
F-statistic		88.425		
Prob F-statistic		0.0000		

The estimation results show an R-squared value of 0.9675, indicating that ESG, SIZE, LEV, ETR, ROA, and EBITM jointly explain 96.75% of the variation in cash holding (CH), while the remaining 3.25% is explained by other factors outside the model. The Prob (F-statistic) value of 0.0000 indicates that the model is statistically significant, meaning that at least one independent variable significantly affects cash holding. ESG has a negative and statistically significant effect on cash holding, with a coefficient of -0.000313 and a probability value of 0.0061 (<0.05). This suggests that higher ESG performance is associated with lower levels of cash holding. Thus, the hypothesis stating that ESG affects corporate cash holding policy is supported. This finding implies that firms with better ESG practices tend to gain higher investor trust and easier access to external financing, reducing the need to hold large cash reserves.

Firm size (SIZE) also shows a negative and significant effect on cash holding, with a coefficient of -0.002925 and a probability of 0.0000. This indicates that larger firms tend to hold less cash, as they generally have better access to external funding sources such as bank loans or capital markets. Leverage (LEV) has a negative and significant effect on cash holding, with a coefficient of -1.63E-05 and a probability of 0.0414 (<0.05). This suggests that firms with higher levels of debt tend to hold less cash, as available funds are often used to meet debt obligations and interest payments.

The effective tax rate (ETR) also has a negative and significant effect, with a coefficient of -0.000170 and a probability of 0.0150. This indicates that higher tax burdens reduce the amount of cash firms are able to retain. In contrast, ROA does not have a significant effect on cash holding, as indicated by a probability value of 0.6453 (>0.05). This suggests that profitability does not directly influence firms' cash holding decisions. Similarly, EBITM also shows no significant effect, with a probability of 0.2338 (>0.05), indicating that operating profit margins do not directly affect cash holding policies.

Overall, the results show that ESG, firm size, leverage, and effective tax rate significantly influence cash holding, while profitability (ROA and EBITM) does not. These findings suggest that cash holding decisions are more strongly driven by governance, firm size, capital structure, and tax obligations rather than profitability.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusions

This study finds that Environmental, Social, and Governance (ESG) performance has a negative and significant effect on cash holding. Firms with better ESG performance tend to hold lower levels of cash. This suggests that ESG practices improve governance quality and reduce the likelihood of excessive cash retention due to agency problems, consistent with M. C. Jensen, (1986) and supported by (Benlemlih, 2019).

In addition, control variables such as firm size (SIZE), leverage (LEV), and effective tax rate (ETR) also have significant negative effects on cash holding, while ROA and EBITM do not show significant effects. These results indicate that cash holding decisions are more influenced by governance, firm size, debt structure, and tax burden than by profitability. Overall, the model is robust and provides reliable estimates.

5.2 Recommendations

Future research is encouraged to extend the model by including additional variables such as growth opportunities, dividend policy, and cash flow volatility to provide a more comprehensive explanation of cash holding behavior. Expanding the study period or including cross-country samples may also offer broader insights and test the consistency of the findings across different contexts. Additionally, future studies may consider incorporating moderating or mediating variables, such as political connections or corporate governance quality, to deepen the understanding of the relationship between ESG performance and corporate cash holding policies.

APPENDICES

1. Descriptive Statistics

	CH	ESG	SIZE	LEV	ETR	ROA	EBITM

Mean	0.093030	4.406943	27.12328	1.998434	0.348462	0.685370	-0.421571
Median	0.052527	0.000000	27.73065	0.452631	0.248777	0.028471	0.077968
Maximum	1.240166	89.02008	33.78996	3191.120	53.32176	3612.443	32.45124
Minimum	-0.000500	0.000000	-0.037841	0.000000	-118.2195	-1391.151	-1608.070
Std. Dev.	0.114996	15.14678	4.959061	55.98192	2.985114	67.12030	32.75507
Skewness	2.602386	3.469928	-4.343387	55.67290	-13.18412	44.17165	-39.90568
Kurtosis	13.51038	14.11546	24.22895	3167.715	831.2487	2577.155	1825.209
Jarque-Bera	19068.94	23804.01	72934.53	1.39E+09	95192559	9.20E+08	4.61E+08
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	309.5093	14661.90	90239.14	6648.790	1159.333	2280.227	-1402.566
Sum Sq. Dev.	43.98313	763067.5	81793.95	10423602	29637.66	14984078	3568448.
Observations	3327	3327	3327	3327	3327	3327	3327

2. Chow Test

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	6.329222	(832,2488)	0.0000
Cross-section Chi-square	3781.861997	832	0.0000

3. LM Test

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided
(all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both

Breusch-Pagan	1613.799	0.954622	1614.753
	(0.0000)	(0.3285)	(0.0000)

4. Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	18.932445	6	0.0043

5. Multicollinearity Test

	ESG	SIZE	LEV	ETR	ROA	EBITM
ESG	1.000000	0.242707	-0.007430	-0.001769	-0.002660	0.005511
SIZE	0.242707	1.000000	0.011058	0.021797	-0.019208	-0.114839
LEV	-0.007430	0.011058	1.000000	0.001713	-0.000304	-0.000601
ETR	-0.001769	0.021797	0.001713	1.000000	-0.001126	0.001498
ROA	-0.002660	-0.019208	-0.000304	-0.001126	1.000000	0.000721
EBITM	0.005511	-0.114839	-0.000601	0.001498	0.000721	1.000000

6. EGLS Panel Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	0.173760	0.010858	16.00315	0.0000
ESG	-0.000313	0.000114	-2.746399	0.0061
SIZE	-0.002925	0.000400	-7.306583	0.0000
LEV	1.63E-05	8.01E-06	2.040894	0.0414
ETR	-0.000170	7.00E-05	-2.432966	0.0150
ROA	2.95E-05	6.41E-05	0.460339	0.6453
EBITM	5.25E-06	4.41E-06	1.190965	0.2338

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.967515	Mean dependent var	0.218393
Adjusted R-squared	0.956573	S.D. dependent var	0.299574
S.E. of regression	0.074268	Sum squared resid	13.72301
F-statistic	88.42519	Durbin-Watson stat	2.212160
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.684804	Mean dependent var	0.093030
Sum squared resid	13.86329	Durbin-Watson stat	2.005310

REFERENCES

Abernathy, J. L., Beyer, B., Gross, A. D., & Rapley, E. T. (2017). Income statement reporting discretion allowed by FIN 48: Interest and penalty expense classification. *Journal of the American Taxation Association*, *39*(1), 45–66. https://doi.org/10.2308/atax-51542

Ahrends, M., Drobetz, W., & Xenia, T. (2018). Cyclicality of growth opportunities and the value of cash holdings. *Journal of Financial Stability*, *37*, 74–96. https://doi.org/10.1016/j.jfs.2018.05.005

Akgün, A. İ., & Memiş Karataş, A. (2020). Investigating the relationship between working capital management and business performance: evidence from the 2008 financial crisis of EU-28. *International Journal of Managerial Finance*, *17*(4), 545–567. https://doi.org/10.1108/IJMF-08-2019-0294

Al-Dhamari, R., Baatwah, S. R., Al-sabri, H. M., & Tawfik, O. I. (2026). ESG controversies and corporate cash holdings: do CEO gender and economic policy uncertainty matter? *International Journal of Disclosure and Governance*. https://doi.org/10.1057/s41310-026-00352-4

Albuquerque, R., Koskinen, Y. J., & Zhang, C. (2019). Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence. *Manag. Sci.*, *65*, 4451–4469. https://api.semanticscholar.org/CorpusID:31442565

Benlemlih, M. (2019). Corporate social responsibility and dividend policy. *Research in International Business and Finance*, *47*, 114–138. https://doi.org/https://doi.org/10.1016/j.ribaf.2018.07.005

Chen, S., Farooq, U., Aldawsari, S. H., Waked, S. S., & Badawi, M. (2025). Impact of environmental, social, and governance performance on cash holdings in BRICS: Mediating role of cost of capital. *Corporate Social Responsibility and Environmental Management*, *32*(1), 1182–1197. https://doi.org/10.1002/csr.3012

Chireka, T., & Fakoya, M. B. (2017). The determinants of corporate cash holdings levels: Evidence from selected South African retail firms. *Investment Management and Financial Innovations*, *14*(2), 79–93. https://doi.org/10.21511/imfi.14(2).2017.08

Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting. *The Accounting Review*, *86*(1), 59–100. https://doi.org/10.2308/accr.00000005

El Ghoul, S., Guedhami, O., Kwok, C. C. Y., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance*, *35*(9), 2388–2406. https://doi.org/https://doi.org/10.1016/j.jbankfin.2011.02.007

Elshandidy, T., Fraser, I., & Hussainey, K. (2013). Aggregated, Voluntary, and Mandatory Risk Disclosure Incentives: Evidence from UK FTSE All-Share Companies. *International Review of Financial Analysis*, *30*, 320–333. https://doi.org/10.1016/j.irfa.2013.07.010

Ferrell, A., Liang, H., & Renneboog, L. (2016). Socially responsible firms. *Journal of Financial Economics*, *122*(3), 585–606. https://doi.org/https://doi.org/10.1016/j.jfineco.2015.12.003

Gillan, S. L., Koch, A., & Starks, L. T. (2021). Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*, *66*, 101889. https://doi.org/https://doi.org/10.1016/j.jcorpfin.2021.101889

Hendrawaty, E. (2019). Value of excess cash holdings of financially unconstrained companies. *Contemporary Economics*, *13*(3), 293–304. https://doi.org/10.5709/ce.1897-9254.314

Hsu, Y.-L., & Yang, Y.-C. (2022). Corporate governance and financial reporting quality during the COVID-19 pandemic. *Finance Research Letters*, *47*, 102778. https://doi.org/https://doi.org/10.1016/j.frl.2022.102778

Hyunjung, C. (2024). Differential Value of Cash Holdings According to Ownership–Control Disparity. *Sustainability (Switzerland)*, *16*(16). https://doi.org/10.3390/su16166774

Im, H. J., Oliver, B., & Park, H. (2022). The effect of stock liquidity on corporate cash holdings: The real investment motive. *International Review of Finance*, *22*(3), 580–596. https://doi.org/10.1111/irfi.12377

Jebran, K., Iqbal, A., Bhat, K. U., Khan, M. A., & Hayat, M. (2019). Determinants of corporate cash holdings in tranquil and turbulent period: evidence from an emerging economy. *Financial Innovation*, *5*(3). https://doi.org/https://doi.org/10.1186/s40854-018-0116-y

Jensen, M. C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *The American Economic Review*, *76*(2), 323–329. http://www.jstor.org/stable/1818789

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360. https://doi.org/https://doi.org/10.1016/0304-405X(76)90026-X

Jensen, M., & Meckling, W. (1976). Theory of The Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*, *3*(4), 305–360. https://doi.org/https://doi.org/10.1016/0304-405X(76)90026-X

Laique, U., Abdullah, F., Rehman, I. U., & Sergi, B. S. (2023). Two decades of research on board gender diversity and financial outcomes: Mapping heterogeneity and future research agenda. *Corporate Social Responsibility and Environmental Management*, *30*(5), 2121–2144. https://doi.org/https://doi.org/10.1002/csr.2510

Marie, M., Qi, B., Elamer, A. A., Khatatbeh, I. N., & Al-Fakir Al Rabab'a, E. (2025). How does board gender diversity drive the ESG performance-cash holdings relationship? Evidence from China. *International Journal of Finance and Economics*, *30*(3), 2705–2723. https://doi.org/10.1002/ijfe.3037

Miniaci, R., & Panteghini, P. M. (2025). On the Capital Structure of Foreign Subsidiaries: Evidence from Panel Data Quantile Regression Models. *German Economic Review*. https://doi.org/10.1515/ger-2024-0123

Nguyen, C. K., Nguyen, A. Q., Nguyen, N. Q., Nguyen, T. T. M., Chu, A. N., & Nguyen, L. T. M. (2023). Cash Holding and Financial Stability during a Crisis: A Case Study of Vietnamese Firms in Covid-19 Pandemic. *Forum for Social Economics*, *52*(3), 298–311. https://doi.org/10.1080/07360932.2021.1944260

Ozkan, A., & Ozkan, N. (2004). Corporate cash holdings: An empirical investigation of UK companies. *Journal of Banking & Finance*, *28*(9), 2103–2134. https://doi.org/https://doi.org/10.1016/j.jbankfin.2003.08.003

Saleh, I., Abu Afifa, M., & Alkhawaja, A. (2025). Environmental, social, and governance (ESG) disclosure, earnings management and cash holdings: Evidence from a European context. *Business Ethics, the Environment and Responsibility*, *34*(2), 295–308. https://doi.org/10.1111/beer.12650

Sivanandan, P. (2024). Sustainability Reporting, Value Creation and Effective Corporate Governance: A Managerial Perspective. In *Strategic Financial Management: A Managerial Approach* (pp. 1–12). https://doi.org/10.1108/978-1-83608-106-720241001

Soetanto, T. V, & Proboyo, A. (2024). Financial statement comparability, cash flow volatility, capital expenditure: are they related to cash holding? *Gestao e Producao*, *31*. https://doi.org/10.1590/1806-9649-2024v31e4224

Suyono, W. P., Handarini, D., Firnanda, R., Puspa, E. S., Anugrah, S., Hermawan, S., & Siregar, S. S. (2026). Digital Shift in Assurance: How ESG Disclosure and Sustainability Practices Drive Audit Quality. *Lecture Notes in Networks and Systems*, *1729 LNNS*, 187–196. https://doi.org/10.1007/978-3-032-11521-8_18

Tekin, H., & Burgazoglu, H. (2022). HOW DO CORPORATE SUSTAINABILITY AND PANDEMIC AFFECT CASH HOLDINGS IN MUSLIM COUNTRIES? *Journal of Islamic Monetary Economics and Finance*, *8*(4), 615–636. https://doi.org/10.21098/jimf.v8i4.1649

Von Kalckreuth, U., Schmidt, T., & Stix, H. (2014). Using cash to monitor liquidity: Implications for payments, currency demand, and withdrawal behavior. *Journal of Money, Credit and Banking*, *46*(8), 1753–1786. https://doi.org/10.1111/jmcb.12165

Wang, Z., Zhang, Y., & Zhao, P. (2024). OPTIMAL CASH HOLDING MODEL BASED ON MINIMIZATION OF RUIN PROBABILITY. *Miskolc Mathematical Notes*, *25*(2), 1009–1024. https://doi.org/10.18514/MMN.2024.4372

Yuan, L., Nor, M. N. M., & Kadir, D. A. (2025). Green cash flow: how ESG performance shapes corporate cash holding strategies. *Frontiers in Sustainability*, *6*. https://doi.org/10.3389/frsus.2025.1531206

Yung, K., Li, D. D., & Jian, Y. (2015). The value of corporate financial flexibility in emerging countries. *Journal of Multinational Financial Management*, *32–33*, 25–41. https://doi.org/https://doi.org/10.1016/j.mulfin.2015.07.001

Zhi, W. (2009). The effect of internal cash flow on the investment of Chinese listed companies. *2009 International Conference on Business Intelligence and Financial Engineering, BIFE*

2009, 836–840. https://doi.org/10.1109/BIFE.2009.192