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HOW DOES CSR STRATEGY IMPACT CORPORATE CASH POLICY IN EMERGING MARKETS? EVIDENCE FROM THE COVID-19 OUTBREAK

Hasan Tekin[a], Ali Yavuz Polat[b]
[a]Karabük University, Turkiye, [b]Gulf University for Science and Technology, Kuwait
e-mail: polat.a@gust.edu.kw; hasantekin@karabuk.edu.tr (corresponding author)

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Abstract

This study investigates the impact of corporate social responsibility (CSR) strategy on corporate cash policy in emerging markets, with a specific focus on the COVID-19 pandemic period. By analysing data from 7,731 firm-years across 30 developing countries during the period 2002-2021, the study finds that CSR has a negative effect on cash holdings. In other words, firms with lower CSR investment tend to hold more cash. However, an interesting finding is that the negative impact of CSR on cash holdings lost its significance during the COVID-19 pandemic. This suggests that during this unprecedented period of economic uncertainty and disruption caused by the pandemic, firms with higher CSR were more inclined to hoard cash as a precautionary measure. In contrast, in normal times, the dominant motive for holding cash appears to be related to agency concerns. Furthermore, the study identifies country-specific variations in the relationship between CSR and cash holdings. For instance, firms in Brazil and Saudi Arabia tend to use cash retention as a response to higher CSR, while firms in Argentina, Malaysia, Mexico, Poland, Taiwan, and Turkiye exhibit the opposite behaviour, using higher CSR as a signal for reduced cash holdings. Additionally, the study sheds light on industry-specific differences in the relationship between CSR and cash holdings. Beverage, construction and material, industrial material, oil, gas, and coal, technology hardware and equipment, telecommunications service provider, and travel and leisure firms are more likely to use cash holdings as a substitute for CSR, while alternative energy and media firms show the opposite pattern, using higher CSR as a signal for reduced cash holdings.

Keywords: *cash holdings, corporate social responsibility, developing, pandemic, sustainability*

I. INTRODUCTION

Just social capital is an important dimension for firms which helps to build cooperation and trust among the stakeholders of a firm. Firms' actions and considerations related to social welfare issues are discussed under the two terminologies interchangeably, namely corporate social responsibility (CSR) or environmental, social and governance (ESG). Especially after the global

financial crisis, firms have become more concerned about CSR/ESG issues since there are multiple incentives for investing in these activities. Firms' efforts related to ESG concerns act as a signalling tool that attracts investors' attention.[1] In turn, ESG activities tend to reduce perceived risk of the firms[2] and enhances firms' value.[3] The extant literature shows that ESG activities decrease the cost of capital for firms and relaxes their financial constraints.[4] ESG involvement also provides immunity to firms during significant crises since ESG concerned firms build trust between with stakeholders. Investors are willing to pay a premium to high-CSR/ESG firms during a significant crisis period such as the COVID-19 pandemic.[5]

Even though there is a vast and still growing body of literature on the impact of firms' CSR/ESG involvement on financial performance[6,7] and on firm value,[8] the relationship between CSR/ESG and cash holdings policy has largely been overlooked. More importantly, it is timely and relevant to investigate this relationship considering the unprecedented effects of the COVID-19 pandemic. The only study focusing on this relationship is Atif,[9] examining the effect of CSR on cash holdings from a life-cycle perspective. They find that ESG disclosure negatively impacts cash holdings in the introduction, growth, and decline stages.

Using a sample of 7,731 firm-year observations from 30 developing countries, we find a negative relationship between CSR strategy score and cash holdings in line with the agency motive. Our sample covers the period between 2002 and 2021, which includes the pandemic period. During the pandemic period the negative relationship disappeared, i.e., firms with higher CSR

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1 Alexander Bassen, Katrin Meyer, and Joachim Schlange, "The Influence of Corporate Responsibility on the Cost of Capital," *SSRN Electronic Journal*, 2011, https://doi.org/10.2139/ssrn.984406.

2 Mohammed Benlemlih et al., "Environmental and Social Disclosures and Firm Risk," *Journal of Business Ethics* 152, no. 3 (2018): 613–26, https://doi.org/10.1007/s10551-016-3285-5.

3 Karl V. Lins, Henri Servaes, and Ane Tamayo, "Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis," *Journal of Finance* 72, no. 4 (2017): 1785–1824, https://doi.org/10.1111/jofi.12505.

4 Allen Goss and Gordon S. Roberts, "The Impact of Corporate Social Responsibility on the Cost of Bank Loans," *Journal of Banking and Finance* 35, no. 7 (2011): 1794–1810, https://doi.org/10.1016/j.jbankfin.2010.12.002.

5 Wenzhi Ding et al., "Corporate Immunity to the COVID-19 Pandemic," *Journal of Financial Economics* 141, no. 2 (2021): 802–30, https://doi.org/10.1016/j.jfineco.2021.03.005.

6 Sadok El Ghoul et al., "Does Corporate Social Responsibility Affect the Cost of Capital?," *Journal of Banking and Finance* 35, no. 9 (2011): 2388–2406, https://doi.org/10.1016/j.jbankfin.2011.02.007.

7 Goss and Roberts, "The Impact of Corporate Social Responsibility on the Cost of Bank Loans."

8 Lins, Servaes, and Tamayo, "Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis."

9 Muhammad Atif, Benjamin Liu, and Sivathaasan Nadarajah, "The Effect of Corporate Environmental, Social and Governance Disclosure on Cash Holdings: Life-Cycle Perspective," *Business Strategy and the Environment* 31, no. 5 (2022): 2193–2212, https://doi.org/10.1002/bse.3016.

strategy score tended to hoard more cash. This is in line with the precautionary motive of holding cash because the pandemic created an immense level of uncertainty and resulted in a significant economic downturn. These results imply that, in general, agency motive is dominant for holding cash except during the unprecedented COVID-19 period, where a precautionary motive subordinated the agency motive. Whether cash retention is used as a substitute tool for corporate governance or whether it is an outcome of the governance mechanism is an open question.[10] We find that firms in Brazil and Saudi Arabia use cash retention as the outcome of a good governance mechanism (higher CSR strategy score), but those in Argentina, Malaysia, Mexico, Poland, Taiwan, and Turkiye use cash holdings as a substitute for good governance.

This study contributes to the CSR/ESG literature in several ways. First, most of the studies in the existing literature focus on the relationship between CSR/ESG and firm performance,[11] value, or risk. The impact of CSR/ESG on corporate capital structure decisions has been overlooked. In that sense, we merge ESG and corporate finance literature. Second, earlier studies focusing on the impact of governance mechanisms on capital structure decisions mostly employ country-specific governance variables.[12] In contrast, this study includes firm-specific governance variable, namely CSR strategy score, to investigate the role of corporate governance on cash holdings.

The article is organised in the following way: Section II mentions the research gap by reviewing the existing literature; Section III proposes the empirical design describing the data and methodology; Section IV presents the empirical findings; and Section V concludes.

II. LITERATURE REVIEW

Modigliani Miller (MM)[13] proposed a theory where capital structure is irrelevant for firms. However, there is a vast and growing body of literature explaining the deviations from the MM model. Agency theory is among one

[10] Hasan Tekin and Ali Yavuz Polat, "Is Leverage a Substitute or Outcome for Governance? Evidence from Financial Crises," *International Journal of Emerging Markets* 18, no. 4 (March 21, 2023): 1007–30, https://doi.org/10.1108/IJOEM-03-2020-0297; Hasan Tekin, "Does Corruption Matter for Corporate Payouts in the Covid Era? Evidence from Muslim Countries," *Buletin Ekonomi Moneter Dan Perbankan* 26, no. 4 (2023): 617–36, https://doi.org/10.59091/2460-9196.1708.

[11] Hasan Tekin and Fatih Güçlü, "Environmental, Social, Governance Investing, COVID-19, and Corporate Performance in Muslim Countries," *Journal of Islamic Monetary Economics and Finance* 9, no. 1 (2023): 107–32, https://doi.org/10.21098/jimf.v9i1.1592.

[12] Rima Turk Ariss, "Legal Systems, Capital Structure, and Debt Maturity in Developing Countries," *Corporate Governance: An International Review* 24, no. 2 (2016): 130–44, https://doi.org/10.1111/corg.12132.

[13] Franco Modigliani and Merton H Miller, "The Cost of Capital, Corporation Finance and the Theory of Investment.," *American Economic Review* 48, no. 3 (1958): 261–97, https://doi.org/10.1257/aer.103.6.i.

of the important theories investigating the principal-agent relations and costs associated with the delegation.[14] The main idea of the agency theory is that there is an inherent conflict of interest in a firm.[15] When there is excess cash in the hands of management, they may use the extra cash for their self-interests rather than investing in profitable projects. Thus, this may reduce firm value due to missed opportunities. Moreover, holding excess cash can also result in low returns for firms due to idling the funds.[16,17] These two costs are the primary costs of holding cash. On the other hand, firms may need cash as a vital source for funding operations during financial downturns or economic fluctuations. In other words, firms hold cash as a precautionary motive.[18]

What is worth exploring is the relationship between cash holdings and a firm's corporate governance quality. This is relevant since the contracts between shareholders and managers are usually incomplete, implying that there is trust plays a role in this principal-agent relationship.[19] It is especially vital for the owners of firms to build trust with the managers during crisis periods. Considering the unprecedented impact of the COVID-19 pandemic, the role of governance quality becomes especially important,[20] since crises affect the capital structure decisions of firms.[21]

There is significant literature analysing the relationship between governance quality and firms' corporate financial decisions.[22] However, most of the

[14] Michael C. Jensen, "Agency Costs of Free Cash Flow , Corporate Finance , and Takeovers Author (s): Michael C . Jensen Source : The American Economic Review , Vol . 76 , No . 2 , Papers and Proceedings of the Ninety-Eighth Annual Meeting of the American Economic Association," *The American Economic Review* 76, no. 2 (1986): 323–29.

[15] Ali Yavuz Polat, "Investor Bias, Risk and Price Volatility," *Journal of Economic Studies* 50, no. 7 (October 25, 2023): 1317–35, https://doi.org/10.1108/JES-04-2022-0211.

[16] Bruce Seifert and Halit Gonenc, "The Effects of Country and Firm-Level Governance on Cash Management," *Journal of International Financial Markets, Institutions and Money* 52 (2018): 1–16, https://doi.org/10.1016/j.intfin.2017.12.001.

[17] Hasan Tekin et al., "Cash Management, Governance, and the Global Financial Crisis: Evidence from Developing Asia," *Asian Economics Letters* 2, no. 4 (August 15, 2021), https://doi.org/10.46557/001c.27135.

[18] Thomas W. Bates, Kathleen M. Kahle, and René M. Stulz, "Why Do U.S. Firms Hold so Much More Cash than They Used To?," *Journal of Finance* 64, no. 5 (2009): 1985–2021, https://doi.org/10.1111/j.1540-6261.2009.01492.x.

[19] Luigi Guiso, Paola Sapienza, and Luigi Zingales, "Trusting the Stock Market," *Journal of Finance* 63, no. 6 (2008): 2557–2600, https://doi.org/10.1111/j.1540-6261.2008.01408.x.

[20] Lins, Servaes, and Tamayo, "Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis."

[21] Antonio D'Amato, "Capital Structure, Debt Maturity, and Financial Crisis: Empirical Evidence from SMEs," *Small Business Economics* 55, no. 4 (2020): 919–41, https://doi.org/10.1007/s11187-019-00165-6.

[22] Tekin et al., "Cash Management, Governance, and the Global Financial Crisis: Evidence from Developing Asia."; Tekin and Polat, "Is Leverage a Substitute or Outcome for Governance? Evidence from Financial Crises."; Zhe An et al., "Dividend Payouts, Cash-Flow Uncertainty and the Role of Institutions," *Journal of Business Finance and Accounting* 49, no. 7–8 (2022): 1356–90, https://doi.org/10.1111/jbfa.12595.

earlier studies mainly use a country-wide governance variable which basically measures the institutional environment in that country. However, what is more interesting is to investigate the relationship between firm-specific governance quality and cash holding decisions. In this regard, we use the CSR strategy score produced by Thomson Reuters, which measures how a firm integrates economic, social, and environmental concerns into its business model.

In recent years, firms have increased their interest in CSR/ESG related activities since there are important incentives for firms' consideration of environmental, social and governance issues. As an important incentive, investors pay a positive premium for the firms with higher CSR activities since they consider the involvement in CSR as a positive signal. This in turn help firms to find external funds under better conditions since CSR involvement decreases firms' perceived risks and enhancing firm value as well.[23] Earlier studies support this insurance mechanism by providing empirical evidence that CSR activities create value for firms and strengthen their financial performance helping them to decrease financial constraints.[24] Investing in CSR activities can be considered as an insurance mechanism especially during unprecedented times.[25] Lins[26] show that during the global financial crisis firms that had higher CSR scores benefited more from the involvement in these activities because they experienced higher profitability and growth during the crisis. This implies that investors are more willing to pay a premium to the firms with higher CSR concerns during a significant crisis period. In other words, investing in CSR activities may have generated a higher return for firms during a crisis. Regarding the costs and benefits of CSR investment, during normal times CSR related investment may seem not profitable, but considering potential downturns, having a higher CSR/ESG score seems to strengthen firms' immunity from the market crashes.[27] During the recent health crisis, the insurance role of ESG

[23] Jaeho Lee and Hakkon Kim, "Do Employee Relation Responsibility and Culture Matter for Firm Value? International Evidence," *Pacific Basin Finance Journal* 40 (2016): 191–209, https://doi.org/10.1016/j.pacfin.2016.10.006; Benlemlih et al., "Environmental and Social Disclosures and Firm Risk."; Remmer Sassen, Anne Kathrin Hinze, and Inga Hardeck, "Impact of ESG Factors on Firm Risk in Europe," *Journal of Business Economics* 86, no. 8 (2016): 867–904, https://doi.org/10.1007/s11573-016-0819-3; Lins, Servaes, and Tamayo, "Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis.".

[24] El Ghoul et al., "Does Corporate Social Responsibility Affect the Cost of Capital?"; Goss and Roberts, "The Impact of Corporate Social Responsibility on the Cost of Bank Loans."

[25] Kee Hong Bae et al., "Does Corporate Social Responsibility Reduce the Costs of High Leverage? Evidence from Capital Structure and Product Market Interactions," *Journal of Banking and Finance* 100 (2019): 135–50, https://doi.org/10.1016/j.jbankfin.2018.11.007.

[26] Lins, Servaes, and Tamayo, "Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis."

[27] He Huang and Ye Ye, "Rethinking Capital Structure Decision and Corporate Social Responsibility in Response to COVID-19," *Accounting and Finance* 61, no. 3 (2021): 4757–88, https://doi.org/10.1111/acfi.12740.

activities was strengthened since ESG activities limit the significant decline in value during the pandemic period which can be considered as an immunity to risk during unprecedented times.[28]

A growing body of literature has focused on the correlation between CSR/ESG and performance. While the literature does not find uniform empirical evidence, most of the studies show that CSR/ESG positively affects financial performance of firms.[29] Also, earlier studies provide evidence on the positive relationship between CSR and firm value[30] especially when customers are more aware of ESG activities of the firms. There exists a mechanism where ESG contributes to firm performance by decreasing the systemic risk for high-ESG rated firms.[31]

The relationship between corporate cash policy and CSR is overlooked in the literature. Atif,[32] as the only study focusing on the cash policy, investigates the impact of CSR disclosure on cash holdings from a life-cycle perspective. They find that CSR disclosure negatively impacts cash holdings in the introduction, growth, and decline stages. Their findings imply that high-CSR firms hold less cash due to having easier access to external funding and capital markets. Our study is the first study focusing on emerging economies and investigates the relationship between CSR and cash holdings. We employ corporate social responsibility–CSR strategy score provided by Thomson Reuters which shows how a corporation integrates CSR concerns into its business model. Higher CSR strategy score implies a better internal governance mechanism which in turn may help to reduce the agency problems that firms face.

III. EMPIRICAL DESIGN

III.A. Data

The sample consists of 7,731 firm-year observations examining 1,275 sample firms from 30 developing countries. We use the Worldscope database of Thomson Reuters DataStream covering the years 2002-2021. We drop financial

[28] Ding et al., "Corporate Immunity to the COVID-19 Pandemic."

[29] Pieter Van Beurden and Tobias Gössling, "The Worth of Values - A Literature Review on the Relation between Corporate Social and Financial Performance," *Journal of Business Ethics* 82, no. 2 (2008): 407–24, https://doi.org/10.1007/s10551-008-9894-x.

[30] Henri Servaes and Ane Tamayo, "The Impact of Corporate Social Responsibility on Firm Value: The Role of Customer Awareness," *Management Science* 59, no. 5 (2013): 1045–61, https://doi.org/10.1287/mnsc.1120.1630.

[31] Rui Albuquerque, Yrjö Koskinen, and Chendi Zhang, "Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence," *Management Science* 65, no. 10 (2019): 4451–69, https://doi.org/10.1287/mnsc.2018.3043.

[32] Atif, Liu, and Nadarajah, "The Effect of Corporate Environmental, Social and Governance Disclosure on Cash Holdings: Life-Cycle Perspective."

and utility firms since they have different accounting structures. Then, we eliminate the firms with missing observations for each variable. Finally, all variables used in our models are winsorised at 1% and 99% to mitigate the outlier effect in the sample.[33]

Table 1 shows the sample construction across country, sector, and year.

Table 1.
Sample Composition

Country	N		Sector	N		Year	N
Argentina	593		Aerospace and defence	746		2002	21
Bahrain	13		Alternative energy	406		2003	24
Brazil	475		Automobiles and parts	1,026		2004	32
Chile	170		Beverages	905		2005	52
China	1,578		Chemicals	963		2006	58
Colombia	55		Construction and materials	410		2007	86
Egypt	39		Food producers	187		2008	155
Hungary	40		General industrials	64		2009	201
India	699		Health care providers	220		2010	349
Indonesia	259		Household goods and home construction	46		2011	381
Kenya	7		Industrial materials	44		2012	403
Kuwait	34		Industrial metals and mining	39		2013	426
Malaysia	386		Industrial transportation	153		2014	455
Mexico	285		Media	17		2015	480
Morocco	14		Medical equipment and services	246		2016	520
Oman	12		Oil, gas and coal	130		2017	657
Peru	88		Personal care, drug, and grocery stores	117		2018	743
Philippines	123		Personal goods	18		2019	1,032
Poland	134		Pharmaceuticals and biotechnology	44		2020	1,196
Portugal	103		Precious metals and mining	10		2021	460
Qatar	50		Retailers	62			
Russia	168		Software and computer services	56			
Saudi Arabia	96		Technology hardware and equipment	930			
South Africa	215		Telecommunications service providers	759			
Sri Lanka	12		Travel and leisure	101			
Taiwan	1,072						
Thailand	305						
Turkiye	240						
United Arab Emirates	457						
Vietnam	9						

Note. This table reports observation numbers (N) by country, sector, and year. *Source.* Thomson Reuters Datastream

[33] Hasan Tekin and Ali Yavuz Polat, "Do Market Differences Matter on Dividend Policy?," *Borsa Istanbul Review* 21, no. 2 (June 1, 2021): 197–208, https://doi.org/10.1016/j.bir.2020.10.009.

Moreover, Table A1 and Table A2 found appended to this article present the descriptive statistics and correlation matrix for the entire sample period and sub-periods, respectively.

The dependent variable is cash holdings–CH, which is the measure of cash and short-term investments divided by total assets.[34] To address robustness issues, we also employ net cash–CN, which is calculated by cash and short-term investments scaled by total assets minus cash and short-term investments.[35]

Our main explanatory variable is CSR strategy score as a proxy for the corporate governance. The CSR is normalised between 0 and 1. A higher score means stronger governance. Next, we include a dummy variable of pandemic–COV, which equals one for years 2020-2021, otherwise zero. Specifically, the interaction term of CSR x COV should show how the role of CSR differs on cash holdings during the pandemic era.

Table 2.
Variable Definitions

Dependent		
Cash holdings	CH	Cash and short-term investments / Total assets
Net cash	CN	Cash and short-term investments / (Total assets – Cash and short-term investments)
Explanatory		
CSR strategy score	CSR	Corporate social responsibility strategy score which shows how a corporation integrates CSR concerns into its business model. This varies between 0 and 1
Covid	COV	Equals 1 for the years 2020 and 2021, otherwise 0
Controls		
Firm size	SIZE	The log of total assets
Dividend issuers	PAY	Equals 1 for the dividend issuers, otherwise 0
Leverage	LEV	Total debt / Total assets
Investment	INV	Capital expenditures / Total assets
Net working capital	NWC	(Current assets – Current liabilities – Cash and short-term investments) / Total assets
Cash flow	CFA	(Pre-tax income + Depreciation) / Total assets
Research-Development	R-D	R-D expenses / Total assets

[34] Adrian Wai Kong Cheung, "Corporate Social Responsibility and Corporate Cash Holdings," *Journal of Corporate Finance* 37 (2016): 412–30, https://doi.org/10.1016/j.jcorpfin.2016.01.008; Hasan Tekin and Huseyin Burgazoglu, "How Do Corporate Sustainability and Pandemic Affect Cash Holdings in Muslim Countries?," *Journal of Islamic Monetary Economics and Finance* 8, no. 4 (2022): 615–36, https://doi.org/10.21098/jimf.v8i4.1649.

[35] Atif, Liu, and Nadarajah, "The Effect of Corporate Environmental, Social and Governance Disclosure on Cash Holdings: Life-Cycle Perspective."

To follow Opler,[36] we add firm size, dividend payers, leverage, investment, net working capital, cash flow and research-development expense into our model as the baseline of cash holdings. Table 2 provides variable descriptions.

III.B. Methodology

Since the sample includes a much greater number of groups *i* (1,275) than number of periods *t* (20), we overcome the unobserved heterogeneity issue by clustering the sample at the firm level. To specify the most convenient panel data estimator, we compare three panel models in Table A3 of the appendix, which are pooled OLS–POLS, fixed effects–FE, and random effects–RE by employing the baseline model as follows:

$$CH_{i,t} = \beta_0 + \beta_1 CSR_{i,t} + \beta_2 SIZE_{i,t} + \beta_3\, PAY_{i,t} + \beta_4 LEV_{i,t} + \beta_5 INV_{i,t} + \beta_6 NWC_{i,t} + \beta_7 CFA_{i,t} + \beta_8 RD_{i,t} + \alpha_i F_i + \alpha_t Y_t + \varepsilon_{i,t} \quad (1)$$

where for firm *i* at time *t*, *CHi,t* is cash holdings, *CSRi,t* is corporate social responsibility–CSR score, *SIZEi,t* is firm size, *PAYi,t* is dividend payers, *LEVi,t* is leverage, *INVi,t* is investment, *NWCi,t* is net working capital, *CFAi,t* is cash flow, *R-Di,t* is research-development expenses, *Fi* is the firm fixed effects, *Yt* is the year fixed effects and $\varepsilon i,t$ is the error term.

To investigate the impact of pandemic–COV and its interaction with CSR on cash holdings, the empirical model for the main analysis of static panel is as follows:

$$CH_{i,t} = \beta_0 + \beta_1 CSR_{i,t} x\ COV_t + \beta_2 CSR_{i,t} + \beta_3 COV_t + \beta_4 SIZE_{i,t} + \beta_5\, PAY_{i,t} + \beta_6 LEV_{i,t} + \beta_7 INV_{i,t} + \beta_8 NWC_{i,t} + \beta_9 CFA_{i,t} + \beta_{10} RD_{i,t} + \alpha_i F_i + \varepsilon_{i,t} \quad (2)$$

where, COVt is the Covid dummy at time *t*, CSRi,t x COVt is the interaction term of CSR and Covid dummy for firm *i* at time *t*.

To overcome the endogeneity issues, previous research employs instrumental variables–IV or bias corrected estimators.[37] We utilise the least

[36] T. Opler et al., "The Determinants and Implications of Corporate Cash Holdings," *Journal of Financial Economics* 40, no. 5 (1999): 223–28.

[37] Mark J. Flannery and Kristine Watson Hankins, "Estimating Dynamic Panel Models in Corporate Finance," *Journal of Corporate Finance* 19, no. 1 (2013): 1–19, https://doi.org/10.1016/j.jcorpfin.2012.09.004; Viet Anh Dang, Minjoo Kim, and Yongcheol Shin, "In Search of Robust Methods for Dynamic Panel Data Models in Empirical Corporate Finance," *Journal of Banking and Finance* 53 (2015): 84–98, https://doi.org/10.1016/j.jbankfin.2014.12.009.

square dummy variable correction–LSDVC by including the lagged dependent variable.[38] The empirical model for the main analysis of dynamic panel is as conjectured:

$$CH_{i,t} = \beta_1 CH_{i,t-1} + \beta_2 CSR_{i,t} x\ COV_t + \beta_3 CSR_{i,t} + \beta_4 COV_t + \beta_5 SIZE_{i,t} + \beta_6\ PAY_{i,t} + \beta_7 LEV_{i,t} + \beta_8 INV_{i,t} + \beta_9 NWC_{i,t} + \beta_{10} CFA_{i,t} + \beta_{11} RD_{i,t} + \alpha_i F_i + \varepsilon_{i,t} \quad (3)$$

where, CHi,t-1 is lagged cash holdings for firm *i* at time *t*.

IV. EMPIRICAL RESULTS

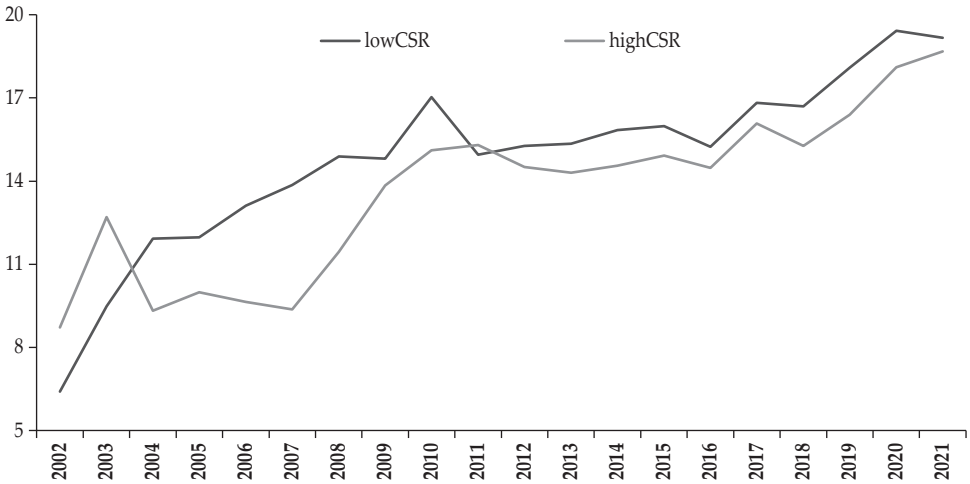
IV.A. Univariate Analysis

Agency motive for cash holdings proposes that firms with higher agency costs hold more cash.[39] Figure 1 shows that firms with lower CSR scores (higher agency costs) carry more cash on their balance sheets than those with higher CSR scores, in line with the agency motive. Moreover, firms in emerging markets generally raise their cash levels over time. Specifically, firms tend to increase their cash levels during an exogenous shock (as in 2008 and 2020), whereas firms with lower/higher CSR decrease/increase their cash levels in the second year of recessions (as in 2009 and 2021). These results imply that generally agency motive is dominant for holding cash but during the unprecedented pandemic period precautionary motive was dominant. Table 3 confirms the trend in cash presented in Figure 1. Since the trend is similar for both firms with lower and higher CSR during the pandemic, the means' differences of firms across the CSR level are not significant. However, they are significantly different for the entire period, which aligns with the agency motive.

[38] Hasan Tekin, "How Optimal Cash Changed by the Global Financial Crisis? A Multi-Country Analysis," *Economics and Business Letters* 9, no. 2 (June 1, 2020): 114–23, https://doi.org/10.17811/ebl.9.2.2020.114-123.

[39] Jensen, "Agency Costs," 324-29.

Figure 1. Trends on cash holdings–CH across low- and high-CSR



Source. Thomson Reuters ESG & Datastream

Table 3.
Means and Differences Before and During the COVID across CSR Level

	2002-2019		2020-2021					
CSR level	**Low**	**High**	**Low**	**High**				
	(1)	**(2)**	**(3)**	**(4)**	**(5) = (1–2)**	**(6) = (3–4)**	**(7) = (1–3)**	**(8) = (2–4)**
CH	0.161	0.149	0.193	0.183	0.012***	0.010	-0.032***	-0.034***
CN	0.217	0.198	0.270	0.252	0.019***	0.018	-0.053***	-0.054***
SIZE	17.472	17.437	17.284	17.484	0.035	-0.200*	-0.012*	-0.047
PAY	0.826	0.824	0.850	0.849	0.002	0.001	-0.024*	-0.025*
LEV	0.247	0.264	0.251	0.253	-0.017***	-0.002	-0.004	0.011
INV	0.058	0.059	0.045	0.046	-0.001	-0.001	0.013***	0.013***
NWC	-0.035	-0.037	-0.042	-0.033	0.002	-0.009	0.007	-0.004
CFA	0.118	0.119	0.103	0.111	-0.001	-0.008	0.015***	0.008
R-D	0.010	0.008	0.013	0.012	0.002***	0.001	-0.003***	-0.004***

Note. This table presents means and differences of firm-level variables across low- and high-CSR as below- and above-median of CSR strategy scores between 2002-2019 and 2020-2021. Variables are defined in Table 2. *** and * imply significance at 1% and 10%.

IV.B. Multivariate Analysis

This study evaluates the impact of CSR strategy score on cash holdings by examining the agency motive of cash during the COVID-19 period. Table 4 shows that CSR is negatively and significantly related to CH and CN, with coefficients of –0.000 at 1% and 5%. In other words, firms with poor CSR hold more cash in line with the agency motive. CSR can be considered a

component of corporate governance. Previous research mentions that firms with good corporate governance have lower cash balances.[40] Also, the Covid dummy–COV is positively associated with both CH and CN. Namely, firms in emerging markets significantly increase their cash level during the pandemic induced crisis. On the other hand, the interaction term of CSR x COV is positive but insignificant. Hence, the negative role of CSR on cash holdings does not change during the pandemic.

Table 4.
Main Analysis: Static Panel Data

Variables	(1) CH		(2) CN	
CSR x COV	0.008	(0.007)	0.011	(0.011)
CSR	–0.009***	(0.003)	–0.013**	(0.006)
COV	0.010***	(0.003)	0.015**	(0.006)
Controls				
SIZE	–0.004***	(0.002)	–0.008***	(0.003)
PAY	0.014***	(0.003)	0.020***	(0.005)
LEV	–0.151***	(0.009)	–0.248***	(0.016)
INV	–0.223***	(0.023)	–0.385***	(0.040)
NWC	–0.175***	(0.009)	–0.300***	(0.015)
CFA	0.118***	(0.010)	0.194***	(0.016)
R-D	–0.068	(0.127)	–0.165	(0.215)
Constant	0.254***	(0.027)	0.390***	(0.046)
Firms	1,275		1,275	
Observations	7,731		7,731	

Note. This table reports the regression of static panel analysis by FE.
Variables are defined in Table 2. *** and ** imply significance at 1% and 5%.

Regarding the control variables, while dividend payouts-PAY and cash flows-CFA are positively associated, firm size-SIZE, leverage-LEV, capital expenditures-INV, and net working capital-NWC are negatively related to cash holdings. However, R-D expenses have no impact on cash retention. In line with the transaction motive, smaller firms hold more cash than larger firms. Nevertheless, the precautionary motive does not support the positive effect of PAY.

In Table 5, we employ the least square dummy variable correction-LSDVC to overcome any possible endogeneity issue. The main difference between dynamic panel data and static panel data is the lagged dependent variable. The coefficients of CSR and COV in Table 5 are qualitatively similar to those in

[40] Amy Dittmar, Jan Mahrt-Smith, & Henri Servaes, "International Corporate Governance and Corporate Cash Holdings," *Journal of Financial and Quantitative Analysis,* 38, no. 1 (2003), 111-133, https://doi.org/10.2307/4126766; Seifert and Gonenc, "Effects on Cash Management," 1-16.

Table 4. However, the positive impact of CSR x COV is significant when we use a dynamic panel estimation employing lagged explanatory variables. These results imply that the negative role of CSR lost its significance during the COVID-19 outbreak. In the pandemic era, while the agency motive fails to explain the corporate cash policy, the precautionary motive does. Moreover, the control variables, excluding R-D expenses, have almost the same effect on cash holdings. The negative influence of R-D on cash retention becomes significant.

Table 5.
Main Analysis: Dynamic Panel Data

Variables	(1) CH		(2) CN	
L.CH	0.670***	(0.001)		
L.CN			0.642***	(0.001)
L.CSR x COV	0.006***	(0.000)	0.002***	(0.000)
L.CSR	–0.002***	(0.000)	–0.001***	(0.000)
COV	0.012***	(0.000)	0.019***	(0.000)
Controls				
L.SIZE	–0.007***	(0.000)	–0.013***	(0.000)
L.PAY	0.001***	(0.000)	0.003***	(0.000)
L.LEV	–0.005***	(0.000)	–0.009***	(0.000)
L.INV	–0.141***	(0.000)	–0.237***	(0.000)
L.NWC	–0.022***	(0.000)	–0.034***	(0.000)
L.CFA	0.001***	(0.000)	0.006***	(0.000)
L.R-D	–0.095***	(0.004)	–0.347***	(0.004)
Firms	1,111		1,111	
Observations	6,463		6,463	

Note. This table reports the regression of dynamic panel analysis by least square dummy variable correction–LSDVC. Variables are defined in Table 2. *** and * imply significance at 1% and 10%.

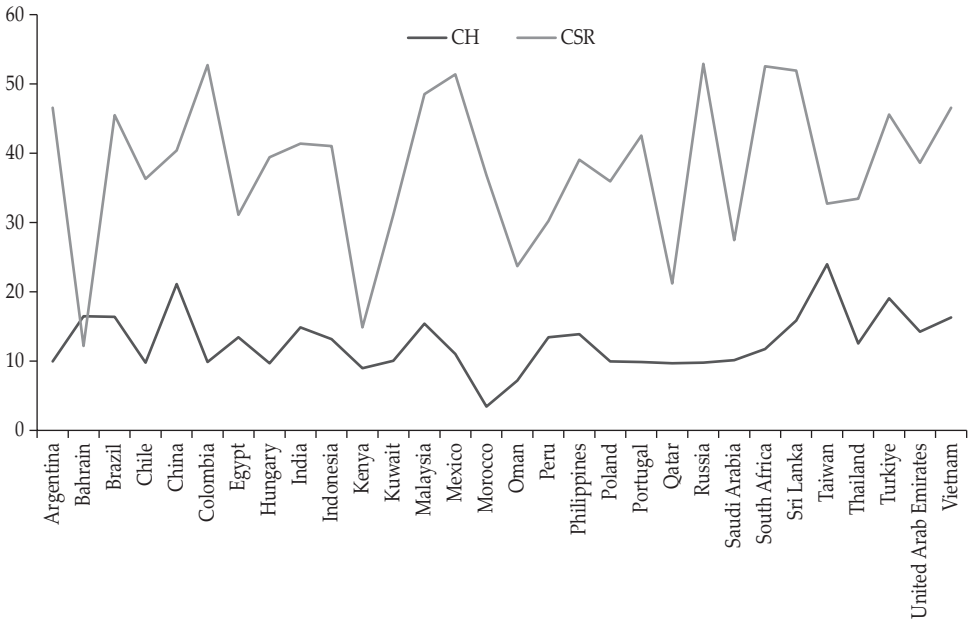
IV.C. Country Analysis

The ESG data of Thomson Reuters restrict the firm-level data of Datastream, and only 30 countries remain which have the firm-level data. Figure 2 shows that the CSR strategy scores differ significantly across countries. While firms in Bahrain, Kenya, Qatar, Oman, and Saudi Arabia have lower CSR scores, between 12% and 27%, those in Colombia, Russia, South Africa, Sri Lanka, and Mexico have higher CSR scores of about 52% and 51%. Furthermore, Moroccan firms have the lowest cash levels with 3.5%, and Taiwanese firms have the highest cash levels with 24%.

Table 6 demonstrates the regression analysis across countries. We include all variables in Table 4, whereas we report only the coefficients of CSR and CSR x COV for brevity. While CSR most significantly and negatively affects cash holdings of firms in Poland and Turkiye (at 1%), the relationship between

CSR and cash is insignificant for firms in Argentina, Mexico (at 5%), Malaysia, and Taiwan (10%). The agency motive confirms can explain this result. Conversely, firms in Brazil and Saudi Arabia with higher CSR hold more cash, contrary to the agency motive. In the COVID era, the negative impact of CSR loses its significance for firms in Malaysia and Turkiye and vice versa for those in Taiwan.

Figure 2. Trends on Cash Holdings–CH and Corporate Social Responsibility–CSR across Countries



Source. Thomson Reuters ESG & Datastream

Table 6.
Main Analysis Across Countries

	Dependent variable: CH			
	CSR x COV		CSR	
Argentina	0.000	(0.000)	–0.000**	(0.000)
Bahrain	–0.037	(0.018)	0.012	(0.015)
Brazil	0.000	(0.000)	0.000**	(0.000)
Chile	–0.000	(0.000)	0.000	(0.000)
China	0.000	(0.000)	–0.000	(0.000)
Colombia	0.000	(0.001)	–0.000	(0.000)
Egypt	–0.000	(0.001)	0.001	(0.001)
Hungary	0.001	(0.001)	0.000	(0.000)
India	0.000	(0.000)	–0.000	(0.000)
Indonesia	–0.000	(0.000)	–0.000	(0.000)

Table 6.
Main Analysis Across Countries (Continued)

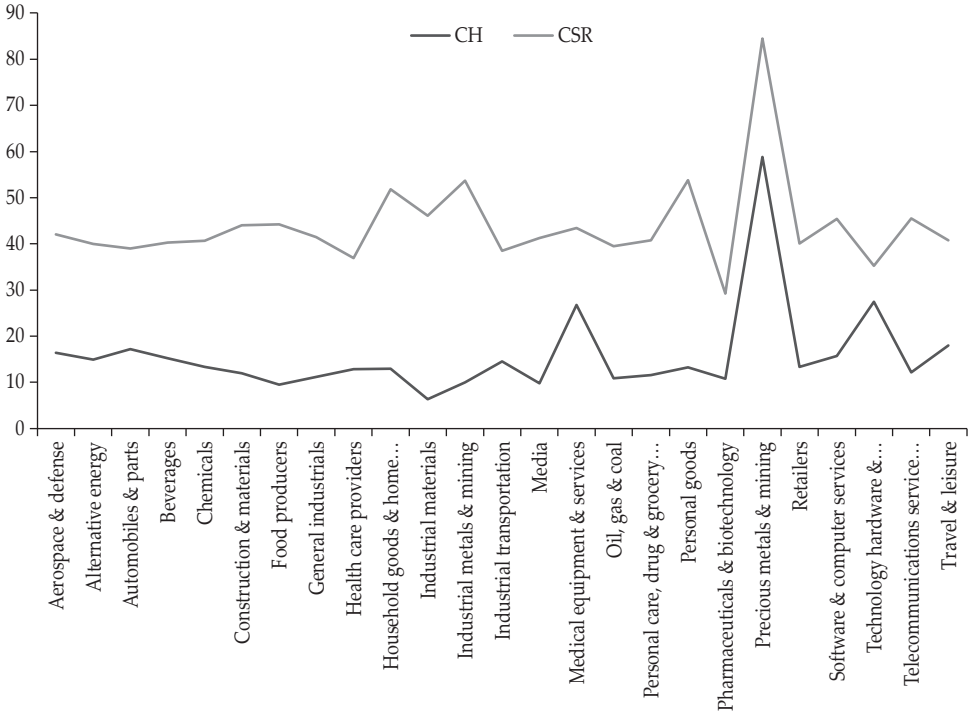
	Dependent variable: CH			
	CSR x COV		CSR	
Kuwait	0.001	(0.001)	0.000	(0.000)
Malaysia	0.001***	(0.000)	–0.000*	(0.000)
Mexico	–0.000	(0.000)	–0.000**	(0.000)
Morocco	–0.000	(0.002)	0.000	(0.000)
Oman	–0.001	(0.002)	0.001	(0.001)
Peru	–0.000	(0.001)	0.000	(0.000)
Philippines	–0.000	(0.000)	0.000	(0.000)
Poland	0.001	(0.000)	–0.001***	(0.000)
Portugal	–0.000	(0.001)	–0.000	(0.000)
Qatar	0.000	(0.000)	–0.000	(0.000)
Russia	–0.000	(0.001)	0.000	(0.000)
Saudi Arabia	–0.000	(0.000)	0.001***	(0.000)
South Africa	–0.001	(0.000)	–0.000	(0.000)
Sri Lanka	–0.005	(0.003)	0.001	(0.001)
Taiwan	–0.000*	(0.000)	–0.000*	(0.000)
Thailand	–0.000	(0.000)	–0.000	(0.000)
Turkiye	0.001***	(0.000)	–0.001***	(0.000)
United Arab Emirates	–0.000	(0.000)	0.000	(0.000)

Note. This table reports the regression of static panel analysis by FE. Variables are defined in Table 2. ***, ** and * imply significance at 1%, 5%, and 10%.

IV.D. Sectoral Analysis

The ESG firm-level data also vary across sectors. Figure 3 shows the variation of CSR strategy score, and cash holding means across 25 industries. Interestingly, precious metals & mining firms peaks on both CSR and cash level at 85% and 59%, respectively. Medical equipment & services and technology hardware & equipment firms have the second and third highest cash levels with 26.7% and 27.4%, in that order. However, industrial material firms have the lowest cash level with 6.3%. Regarding the CSR strategy scores, personal goods, industrial metals and mining, and household goods and home construction firms take the second, third, and fourth places with 53.8%, 53.7%, and 51.8% respectively. Pharmaceuticals and biotechnology firms have the lowest CSR score with 29.2%.

Figure 3. Trends on Cash Holdings–CH and Corporate Social Responsibility–CSR across Sectors



Source. Thomson Reuters ESG & Datastream

Table 7 presents the regression analyses across 25 sectors. There was a positive (at 10%) association between CSR and cash for alternative energy and media firms. However, a negative (at 10%) relationship between CSR and cash for construction and materials as well as technology hardware and equipment firms became more significant for beverages and oil, gas, and coal firms at %5 and industrial materials, telecommunications service providers, and travel and leisure firms at 1%. During the pandemic period, alternative energy as well as automobiles and parts firms with higher CSR hold more cash that aligns with the precautionary motive. In contrast, household goods and home construction and technology hardware and equipment firms with lower CSR had higher cash balances, which is confirmed by the agency motive.

Table 7.
Main Analysis Across Sectors

	Dependent variable: CH			
	CSR x COV		CSR	
Aerospace & defence	0.000	(0.000)	0.000	(0.000)
Alternative energy	0.001**	(0.000)	0.000*	(0.000)
Automobiles & parts	0.000**	(0.000)	–0.000	(0.000)
Beverages	0.000	(0.000)	–0.000**	(0.000)
Chemicals	0.000	(0.000)	0.000	(0.000)
Construction & materials	0.000	(0.000)	–0.000*	(0.000)
Food producers	0.000	(0.000)	–0.000	(0.000)
General industrials	0.001	(0.001)	0.000	(0.000)
Health care providers	0.000	(0.000)	–0.000	(0.000)
Household goods & home construction	–0.002**	(0.001)	0.000	(0.000)
Industrial materials	0.000	(0.001)	–0.001***	(0.000)
Industrial metals & mining	0.000	(0.001)	0.000	(0.000)
Industrial transportation	–0.001	(0.001)	0.000	(0.000)
Media	–0.000	(0.002)	0.001*	(0.001)
Medical equipment & services	0.000	(0.000)	–0.000	(0.000)
Oil, gas & coal	0.000	(0.000)	–0.000**	(0.000)
Personal care, drug & grocery stores	–0.000	(0.001)	0.001	(0.000)
Personal goods	0.038	(0.165)	–0.000	(0.001)
Pharmaceuticals & biotechnology	–0.003	(0.002)	–0.001	(0.000)
Precious metals & mining	–0.002	(0.000)	0.001	(0.000)
Retailers	–0.000	(0.001)	–0.001	(0.000)
Software & computer services	–0.001	(0.002)	–0.000	(0.001)
Technology hardware & equipment	–0.001***	(0.000)	–0.000*	(0.000)
Telecommunications service providers	–0.000	(0.000)	–0.000***	(0.000)
Travel & leisure	–0.001	(0.001)	–0.001***	(0.000)

Note. This table reports the regression of static panel analysis by FE. Variables are defined in Table 2. ***, ** and * imply significance at 1%, 5%, and 10%.

IV.E. Annual Regressions

To understand how the determinants of cash holdings change by year, we make an annual analysis, as presented in Table 8. We also include three more firm-specific factors: market-to-book ratio (MBR); profitability (PROF); and industry sigma (INSIG), as in previous research.[41] Since we focus only sign and significance of coefficients, we report only signs and the significance levels. The impact of CSR on cash is not consistent over time. Specifically, CSR becomes negatively significant when a recession starts (as in 2008 and 2020).

Interestingly, firm-level control variables became significant with the rise of the global financial crisis in 2008. Especially, leverage-LEV, investment-INV,

[41] Kyojik Roy Song, and Youngjoo Lee, "Long-term Effects of a Financial Crisis: Evidence from Cash Holdings of East Asian Firms," *Journal of Financial and Quantitative Analysis,* 47, no. 3 (2012): 617-641, https://doi.org/10.1017/S0022109012000142.

net working capital-NWC, and R-D expenses gained and remained substantial from 2008 to 2021. Firms in emerging markets use dividends as the signalling device in times of exogenous shocks. Unlike during a financial crisis, firm size becomes significant and negative during the COVID outbreak. Also, there is no consistency in additional firm-level controls (MBR, PROF, and INSIG).

Table 8.
Annual Regressions

	Dependent variable: CH										
	CSR	**SIZE**	**PAY**	**LEV**	**INV**	**NWC**	**CFA**	**R-D**	**MBR**	**PROF**	**INSIG**
2002	+	–	+	–	+	+	–	+	–	+	–
2003	+	–	+	–	+	–	+	+	–	–	–
2004	+	–	+ *	–	–	+	–	+	+ *	+	–
2005	–	+	+	–	–	+	+	–	–	–	–
2006	– ***	–	+	+	+	–	+	+	–	+	+
2007	– **	+	+	–	– *	–	–	+	+	+ *	+ *
2008	– **	+ *	+ ***	– ***	– ***	– ***	–	+ ***	–	+ *	+ **
2009	–	+	+ **	– **	– ***	– *	–	+ ***	–	+	+
2010	–	–	+	– ***	– ***	– ***	–	+ ***	–	+ **	+
2011	+	+	+	– ***	– ***	– ***	–	+ ***	–	+	–
2012	–	–	–	– ***	– **	– ***	–	+ ***	–	+ **	–
2013	–	+	–	– ***	– ***	– ***	–	+ ***	– **	+ ***	–
2014	–	+	+	– ***	– *	– ***	+	+ ***	–	+	–
2015	–	+	–	– ***	– ***	– *	+	+ ***	+	–	+
2016	–	–	–	– ***	– ***	– ***	+ **	+ ***	+	–	–
2017	–	–	–	– ***	– ***	– ***	–	+ ***	+	+ **	–
2018	+	–	–	– ***	– ***	– ***	– **	+ ***	+	+ ***	– **
2019	– *	– **	+	– ***	– ***	– ***	– **	+ ***	+ ***	+ ***	+ *
2020	– *	– **	+ ***	– ***	– ***	– ***	– ***	+ ***	+ ***	+ ***	+
2021	+	– **	+	– ***	– ***	– ***	– ***	+ ***	+ ***	+ ***	+

Note. This table reports the cross-section analysis. Variables are defined in Table 2. ***, ** and * imply significance at 1%, 5%, and 10%.

V. CONCLUDING REMARKS

This study aims to assess the impact of CSR strategy as well as the COVID-19 outbreak on corporate cash policy in emerging markets. Using 7,731 firm-years from 30 developing countries, we utilise firm-fixed effects to mitigate unobserved heterogeneity. Empirical results show that firms with lower CSR strategy score hold more cash, which aligns with the agency motive. Nevertheless, the negative impact of CSR loses its significance in the COVID-19 era. In other words, firms with higher CSR tend to hold cash. So, the agency motive loses its explanatory power, the precautionary motive is dominant during the pandemic period. Moreover, firms in Brazil and Saudi Arabia use cash retention as the outcome of higher CSR, and vice versa for

those in Argentina, Malaysia, Mexico, Poland, Taiwan, and Turkiye. Likewise, beverage, construction and material, industrial material, oil, gas, and coal, technology hardware and equipment, telecommunications service provider, and travel and leisure firms use cash holdings as a substitute for CSR, and vice versa for alternative energy and media firms.

The findings of this article carry significant implications for various stakeholders, including firms, shareholders, and regulators:

Firms: The study emphasises the importance of transparent and accurate CSR information disclosure for companies. By providing comprehensive CSR information, firms can effectively reduce their risk profile, which, in turn, allows them to operate with smaller cash holdings. This can lead to improved financial efficiency and reduced financial risk for the company. Firms should thus prioritise CSR initiatives and ensure that they are adequately communicated to investors and the public.

Shareholders: The study highlights that excess cash holdings may not be the most efficient use of resources for shareholders. Instead of hoarding cash for precautionary purposes, firms can enhance shareholder value by paying out excess cash in the form of dividends or engaging in share buybacks. This can increase profitability and overall firm value, making the company more attractive to investors.

Regulators: The study underscores the importance of supporting and incentivising firms to adopt transparent CSR disclosure practices. Transparent CSR disclosure not only benefits investors who demand this information but also contributes to better-informed decision-making by stakeholders. Regulators can play a pivotal role in encouraging CSR reporting standards and providing guidelines for firms for improving their CSR reporting practices.

The research also highlights how CSR reporting practices can drive investor demand and increase value in the long-term. The research highlights the growing demand for CSR information from investors. As investors become more socially conscious and place greater importance on sustainable practices, firms that prioritise CSR and provide transparent disclosure are likely to attract a larger investor base. Meeting investor demand for CSR information can enhance a firm's reputation and positively impact its valuation in the market.

Similarly, the long-term value creation potential of CSR initiatives. By focusing on sustainable practices and reducing risk through CSR activities, firms can enhance their long-term financial performance and resilience. This aligns with the growing recognition that sustainable practices can lead to a more stable and successful business model over time.

Overall, the article's findings highlight the mutual benefits of transparent CSR disclosure and sustainable practices for firms, shareholders, and the

broader financial ecosystem. Implementing CSR initiatives and adopting transparent reporting practices can lead to improved financial performance, reduced risk, and enhanced shareholder value, ultimately contributing to a more sustainable and responsible business landscape.

APPENDIX

Table A1.
Descriptive Statistics

	2002-2021			2002-2019			2020-2021		
	Mean	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**	**Min**	**Max**
CH	0.162	0.000	1.000	0.155	0.000	1.000	0.188	0.000	0.961
CN	0.219	0.000	1.000	0.208	0.000	1.000	0.261	0.000	1.000
CSR	0.408	0.000	0.999	0.410	0.000	0.999	0.402	0.000	0.998
SIZE	17.439	4.205	26.581	17.455	4.205	26.581	17.384	9.292	26.522
PAY	0.830	0.000	1.000	0.825	0.000	1.000	0.850	0.000	1.000
LEV	0.254	0.000	1.000	0.255	0.000	1.000	0.252	0.000	1.000
INV	0.056	0.000	0.667	0.058	0.000	0.667	0.046	0.000	0.383
NWC	-0.036	-0.956	0.810	-0.036	-0.956	0.810	-0.038	-0.956	0.644
CFA	0.116	-1.000	0.998	0.119	-1.000	0.998	0.107	-1.000	0.998
R-D	0.010	0.000	0.258	0.009	0.000	0.234	0.013	0.000	0.258

Note. This table presents descriptive statistics across for the whole period (2002-2021) and subperiods 2002-2019 and 2020-2021. Variables are defined in Table 2.

Table A2.
Correlation Matrix

	CH	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**	**VIF**
2002-2021									
[1] CSR	-0.053								1.01
[2] SIZE	-0.054	0.004							1.15
[3] PAY	0.100	-0.002	0.261						1.18
[4] LEV	-0.338	0.047	0.190	-0.117					1.39
[5] INV	-0.158	0.010	0.123	0.095	0.044				1.11
[6] NWC	-0.004	-0.009	-0.083	0.123	-0.369	-0.114			1.19
[7] CFA	0.154	0.017	0.106	0.273	-0.304	0.252	0.141		1.28
R-D	0.390	-0.055	-0.012	0.089	-0.218	-0.054	0.062	0.010	1.07
2002-2019									
[1] CSR	-0.060								1.01
[2] SIZE	-0.021	-0.010							1.18
[3] PAY	0.086	-0.007	0.298						1.20
[4] LEV	-0.321	0.064	0.178	-0.100					1.35
[5] INV	-0.163	0.011	0.141	0.098	0.056				1.12
[6] NWC	-0.015	-0.019	-0.072	0.116	-0.350	-0.122			1.17
[7] CFA	0.152	0.007	0.127	0.283	-0.292	0.252	0.131		1.28
R-D	0.399	-0.064	0.014	0.071	-0.200	-0.075	0.052	0.006	1.06

Table A2.
Correlation Matrix (Continued)

	CH	[1]	[2]	[3]	[4]	[5]	[6]	[7]	VIF
2020-2021									
[1] CSR	-0.027								1.01
[2] SIZE	-0.187	0.066							1.10
[3] PAY	0.142	0.021	0.084						1.12
[4] LEV	-0.395	-0.011	0.245	-0.181					1.55
[5] INV	-0.096	0.002	0.019	0.104	-0.010				1.09
[6] NWC	0.035	0.024	-0.136	0.151	-0.436	-0.090			1.27
[7] CFA	0.191	0.059	-0.011	0.239	-0.360	0.235	0.188		1.28
R-D	0.345	-0.020	-0.113	0.143	-0.278	0.062	0.100	0.041	1.11

Note. This table presents the correlation matrices across for the whole period (2002-2021) and subperiods 2002-2019 and 2020-2021. Variance inflation factor (VIF) values presented to check whether the sample deal with any multicollinearity problem. Since all VIF values smaller than 5, there is no multicollinearity problem. Variables are defined in Table 2.

Table A3.
Model Selection

Variables	Dependent variable: CH					
	Pooled OLS – POLS		Fixed effects – FE		Random effects – RE	
	(1)		(2)		(3)	
CSR	–0.008**	(0.004)	–0.007**	(0.003)	–0.008***	(0.003)
Controls						
SIZE	–0.003***	(0.001)	–0.004*	(0.002)	–0.005***	(0.001)
PAY	0.008**	(0.004)	0.014***	(0.003)	0.016***	(0.003)
LEV	–0.188***	(0.008)	–0.151***	(0.009)	–0.176***	(0.008)
INV	–0.440***	(0.027)	–0.228***	(0.024)	–0.265***	(0.023)
NWC	–0.144***	(0.008)	–0.177***	(0.009)	–0.171***	(0.008)
CFA	0.144***	(0.011)	0.117***	(0.010)	0.119***	(0.009)
R-D	1.231***	(0.061)	–0.072	(0.128)	0.918***	(0.090)
Constant	0.138***	(0.028)	0.231***	(0.034)	0.255***	(0.022)
R-squared	0.353		0.802		0.316	
Firm FE	No		Yes		No	
Sector FE	Yes		No		Yes	
Year FE	Yes		Yes		Yes	
Firms	1,275		1,275		1,275	
Observations	7,731		7,731		7,731	
Diagnostic tests						
FE vs. POLS						
AIC	–12,837		–22,087			
BIC	–12,462		–21,892			
FE vs. RE						
Hausman			223.33***			
Overid			202.04***			

Note. This table reports the regression results across three panel data methods: pooled OLS (POLS), fixed effects (FE), and random effects (RE) Variables are defined in Table 2. ***, ** and * imply significance at 1%, 5%, and 10%.

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