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Corporate Social Responsibility and Firm Liquidity Risk: U.S. Evidence

Hong Zhao [1], Zixuan Jiao [2], Jianrong Wang [3,*] and Amina Kamar [4]

[1] School of Management, Xi'an Jiaotong University, Xi'an 710049, China; zhaored@xjtu.edu.cn
[2] Stuart School of Business, Illinois Institute of Technology, Chicago, IL 60616, USA; zjiao4@hawk.iit.edu
[3] Faculty of Economics and Management, East China Normal University, Shanghai 200062, China
[4] Maroun Semaan Faculty of Engineering and Architecture, Department of Electrical and Computer Engineering, American University of Beirut, Beirut 1107 2020, Lebanon; aak56@mail.aub.edu
* Correspondence: jrwang@aebs.ecnu.edu.cn

Abstract: In this study, we empirically investigate whether and to what extent corporate social responsibility (CSR) may affect firm liquidity risk. We define liquidity risk as the covariance between market-wide liquidity shocks and individual firms' stock returns and employ two methods to estimate firm liquidity risk. We find a negative association between CSR and firm liquidity risk after controlling for various firm characteristics, i.e., year and industry fixed effects. Our results are robust to possible endogeneity issues when we adopt two-stage lease square estimator and dynamic GMM estimator. In addition, we document that the negative relation between CSR and firm liquidity risk is more pronounced when firms have higher reliance on external financing.

Keywords: liquidity risk; liquidity; corporate social responsibility; systematic risk

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1. Introduction

Corporate social responsibility (CSR) has become an increasingly important component of the business practice of most US firms' operation over the last decade [1]. Although scholars across different business disciplines have extensively examined the effects of CSR on firm financial performance, the results are largely inconclusive [2,3]. An emerging line of research turns to look at the relationship between CSR and firm risk because firm risk can be an important mechanism through which CSR affects firm value. There is a large body of literature that documents a negative relationship between CSR and firm risk. The rationale behind these empirical observations is as follows: On the one hand, CSR can function as a tool for firms to engage in risk management and thus to mitigate the consequences of negative outcomes or unforeseen events. This effect is also known as "insurance-like" protection, which can be used to preserve firms' financial performance by generating moral capital or goodwill [4]. For example, firms experiencing big challenges, lawsuits, or fines may face increased risk. The moral capital created by CSR can serve as a cushion to alleviate the adverse influence of such events on firms' cash flow [5]. On the other hand, CSR represents a transparent resource management that leads to the expected results including economic, political, social, an environmental. Therefore, the firms that engage into intensive CSR may not maximize their profit in the short term but are likely to become sustainable firms in the long term because of the "sustainable hand" which, within a market, seeks the social optimum [6,7]. In this case, CSR firms not only focus on profit maximization but also consider objectives and responsibilities in the social, environmental, ethical, and, of course, economic fields. The "sustainable hand" reallocates the resources to these firms optimally with the objective of seeking social optimum. Specifically, when there is a resources misallocation in the market, this "sustainable hand" will reallocate the scared resources to those firms with intensive CSR engagements as these firms will lead to social optimum in the long run. This reallocation generated by the "sustainable hand" will help these CSR firms operate, develop, and hedge risk in the long run.

Liquidity risk measures how firm's stock returns will be affected by the shocks in market-wide aggregated liquidity, and it has been shown to be an independent source of systematic risk in empirical asset pricing literature [8,9]. The shortage of market liquidity may have a detrimental effect on the whole economic system and that is when "insurance" is expected to pay off. For example, the recent financial crisis is a liquidity crisis. The dry-out of liquidity and fear of recession cause large drops in the equity market globally. If CSR can provide "insurance-like" protection, it is natural to ask: Can CSR engagements protect firms from liquidity risk? If so, to what extent and through what channel does the moral capital created by CSR affect firm's liquidity risk? In this study, we focus on the relation between CSR and firm liquidity risk to add new evidence and shed further light on this line of research.

To test the relationship between firm's CSR and the liquidity risk, we define firm's liquidity risk as "liquidity betas". Mathematically, "liquidity betas" are the covariance between a firm's stock returns and market-wide liquidity shocks, and it has been shown that stocks with higher liquidity risk, represented by "liquidity betas", exhibit higher expected returns. Unlike the other risk metrics that have a consensus in their measurements, liquidity risk is a broad concept and one single measure cannot capture all aspects of liquidity risk. In this study, we employ two widely used market-wide liquidity (illiquidity) measures: Amihud's illiquidity measure [10] and Pástor and Stambaugh's liquidity measure [9]. These two measures are different in terms of their liquidity dimension: The former treats liquidity as asset's price pressure while the latter captures asset's price reversal. Our study finds evidence of a mitigating effect of CSR on firms' liquidity risk. Using a large sample of U.S. public firms from 1993 to 2018, we document a significantly negative relationship between CSR and the liquidity risk, indicating that socially responsible firms have lower liquidity risk. Our results are robust after controlling for firm-level characteristics including firm size, book-to-market ratio, financial leverage, ROA, capital expenditure, R&D, sales growth, and corporate governance. We also control for the liquidity level that may correlate with both of the CSR and the liquidity risk. We employ two-stage least square regression and dynamic Generalized Moment of Method (GMM) to control for the endogeneity issue. In addition, we examine an economic channel through which CSR could affect firm's liquidity risk. Firms with better CSR performance pay special attention to stakeholder's well-being, including banks and investors, who serve as important part of stakeholders. In addition, firms with better CSR performance represent higher financial and operation transparency, reinforcing bankers' and investors' trust during liquidity shortage periods. Both of these factors facilitate firms' access to capital from banks and investors, and thus these firms can maintain healthy cash flow for operation. As a consequence, stock returns of these firms will less likely to be affected negatively when market-wide liquidity experiences negative shocks. Inspired by Moshirian's et al. [11] external equity finance dependence, we construct external capital finance dependence measure and find that the negative relationship between CSR and the liquidity risk to be more prominent for firms heavily relying on external capital finance.

2. Related Literature

Our research builds on to two strands of existing literature. First, our work relates to a growing literature that examines the effect of corporate socially responsibility (CSR) on risk. For example, Husted [3] concludes that CSR is negatively associated with the firm's ex ante downside business risk; Harjoto and Jo [12] find that CSR intensities reduce the volatility of stock return and the cost of capital and increase firm value; Kim et al. [13] documents a negative relationship between CSR and stock price crash risk owing to high-CSR firms committing to a high standard of financial and operation transparency and engaging in less bad news hoarding; Hsu and Chen [14] examine the effect of CSR performance on firm default risk, and they find evidence that good CSR helps to reduce the credit risk and bankruptcy risk; Cai et al. [15] conclude that CSR engagement negatively affects firm risk proxied by several risk measures including CAPM beta, Fama and French market beta, standard deviation of daily stock returns, and downside risk; Lins et al. [16] finds that firms with high CSR intensity have higher stock returns during financial crisis as social capital pays off when market suffers a negative shock; Mishra and Modi [17] contend that CSR has a significant effect on the idiosyncratic risk of firms, with positive CSR reducing risk and negative CSR increasing it; Harjoto and Laksmana [18] find that CSR performance is negatively associated with the deviations from optimal risk taking level; Albuquerque et al. [19] provide a theoretical model predicting that CSR decreases systematic risk and the effect are prominent for firms with high product differentiation; El Ghoul et al. [20] add new insight to this strand of literature by studying the relation between CSR and cost of equity. They point out that high CSR firms have lower cost of equity than low CSR firms as low CSR firms have a reduced investor base and higher perceived risk; later, they extend their study by documenting a negative relationship between CSR and the cost of equity on a global basis [21].

Liquidity has shown to be a priced state variable, and this risk-based view of liquidity has attracted much attention in past two decades, which has led to several studies confirming the pricing role of liquidity risk [8,9]. Scholars also propose an illiquidity measure and confirm the pricing role of the liquidity risk by showing that market-wide shocks in this illiquidity measure negatively affect contemporaneous realized returns [22]. Watanabe and Watanabe [23] examine how the pricing relationship varies across different economic states. Some studies investigate liquidity risk outside the U.S. market. For example, scholars employ the portion of the zero daily returns over a month as a liquidity measure and confirm the liquidity being a priced factor in 18 emerging markets [24]. Lee [25] points out that the pricing role of the liquidity risk varies across countries because of different geographic, economic, and political environments. Liang and Wei [26] build on Lee's research [25] and confirm that the liquidity risk is a pricing factor in a local and global basis. In addition, existing studies also employ liquidity risk to explain documented classical anomalies [27,28]. Building upon these strands of existing literature, we put forward the hypothesis as follows:

Hypothesis 1 (H1). *Corporate social performance is negatively related to firm's liquidity risk.*

The unexpected shortage of market liquidity has a detrimental effect on firm's operation when market-wide liquidity experiences a negative shock. Financial constraint has an adverse effect on firms, exhausting the internal capital and deteriorating their operating performance, both of which may pull down the stock price. CSR investments aim to improve stakeholders' well-being and therefore can enhance stakeholders' willingness to provide critical resources or effort to support firms' operation. Banks and investors are important stakeholders. During a liquidity crisis, banks and investors are more likely to supply capital to socially responsible firms as such firms have allocated resources to fulfill stakeholders' demands. We argue that the negative relationship between CSR and the liquidity risk will be more pronounced for firms with higher external capital reliance. We put forward the hypothesis as follows:

Hypothesis 2 (H2). *The negative relationship between CSR and firm's liquidity risk is more pronounced for firms with higher external capital reliance.*

The external environment has been shown as a force to influence the magnitude of the effect of business strategy on economic outcomes. In this study, we further focus on the regional trust level to present a contextual background and investigate the differential effect of CSR on liquidity risk at regions with different trust levels. Firms located at trustworthy regions enjoy advantages in access to finance, obtaining capital at lower prices, and withstanding risk. When the trustworthy appearance of a region lacks, the moral capital accumulated by the individual firms should be valued more by outsiders. CSR activities can build trust with stakeholders directly and this trust building will eventually transfer into the access to capital. When firms operate in low-trust areas, where it is hard to build trust, those firms with intensive CSR engagements will be viewed as more trustworthy by capital providers and thus these capital providers are more willing to supply capital to these firms. Therefore, we propose the hypothesis as follows:

Hypothesis 3 (H3). *The negative relationship between CSR and firm's liquidity risk is more pronounced when the regional trust level is low.*

3. Data, Sample, and Measures

3.1. Data

To investigate the relationship between firms' CSR and the liquidity risk, we rely on three data sources to construct our sample. We obtain corporate social ratings data from the MSCI ESG database, which is also known as KLD database. Firms are rated on variety of strengths and concerns on the following seven attributes: community, diversity, employee relations, environment, product, human rights, and governance.

We first recover the missing CUSIP from 1991 to 1995 by stock ticker and company name and then merge KLD data with the Compustat for the financial information using CUSIPs as firm identifiers. Before we merge this combined dataset with Center for Research in Security Prices (CRSP) database, we employ several screenings on CRSP data to construct our liquidity risk measures, which will be discussed in detail shortly. After matching across all three databases and accounting for lags in variables, we end up with a final sample of 30,753 firm-year observations from 1993 to 2018.

3.2. Corporate Social Responsibility Measure

We rely on KLD to construct CSR measures. KLD assigns a binary rating to a set of concerns and strengths with each of the following seven areas: community, diversity, employee relations, environment, human rights, product, and corporate governance. For each firm-year, we calculate a net score for each of attributes equal to the number of strengths minus the number of concerns. We then sum up all strengths and concerns respectively across all attributes to obtain overall CSR_str and CSR_con. Our main interested variable, CSR_net, is obtained by subtracting CSR_con from CSR_str. We exclude corporate governance when constructing CSR_str, CSR_con, and CSR_net following the literature [20].

3.3. Measure of Firm Liquidity Risk

Liquidity is a broad and elusive concept and is not directly observed. There are many empirical measures as liquidity has numerous aspects that cannot be captured into one single measure. Generally, it denotes the ability to trade large quantities quickly at low cost with little price impact. Along the empirical asset pricing literature, it has been widely shown that liquidity affects cross-sectional differences of asset returns through two different channels, either a characteristic (level of liquidity) or a risk factor. For example, numerous studies investigate whether expected returns are related to level of liquidity, including [29–34]. On the contrary, some scholars have paid more attention to the systematic liquidity risk as opposed to the level of liquidity per se [25–28].

In this study, we do not consider other levels of liquidity measures that capture the bid ask spread, transaction cost, or market depth. Instead, we focus on two types of liquidity risk betas of firms, which are our main dependent variables. The liquidity risk beta is defined as the sensitivity of stock returns to the market-wide liquidity risk. In order to estimate betas, we employ two widely used market-wide liquidity (illiquidity) measures: Amihud's illiquidity measure [10] and Pástor and Stambaugh's liquidity measure [9]. The former describes liquidity as asset's price pressure while the latter captures asset's price reversal.

3.3.1. Pástor and Stambaugh's Liquidity Risk Measure

We start off with the Pástor and Stambaugh's liquidity measure [9]: They define liquidity as being associated with temporary price fluctuations induced by order flows. The market-wide liquidity level is calculated as the equally weighted average of the liquidity measures of individual stocks using CRSP daily data within the month. We closely follow Pástor and Stambaugh's procedure [9] to exclude stocks on NASDAQ because volume data on NASDAQ include interdealer trades, and this results in an artificially higher volume on NASDAQ. Therefore, we only retain common shares (CRSP share codes 10 and 11) on NYSE and AMEX (CRSP exchange codes 1 and 2). The liquidity is the coefficient $\gamma_{i,t}$ is presented in the following OLS regression:

$$r^{e}_{i,d+1,t}= \alpha_{i,t}+\beta_{i,t}r_{i,d,t}+\gamma_{i,t} \times \mathrm{sign}\left(r^{e}_{i,d,t}\right) \times \nu_{i,d,t} +\varepsilon_{i,d+1,t}\ d = 1, \ldots , D, \tag{1}$$

where $r_{i,d,t}$ is the stock i's return on day in month t. $r^{e}_{i,d,t}$ is the return of stock i over and above the market return, and mathematically, $r^{e}_{i,d,t}= r_{i,d,t} - r_{m,d,t}$, where $r_{m,d,t}$ is the return on CRSP value-weighed return on day d in month t. $\nu_{i,d,t}$ represents the trading volume measured in USD 10 million. We apply the similar screening procedure suggested by Pástor and Stambaugh [9]: We retain stocks with share price between USD 5 and USD 1000 at the end of the previous month; we only retain stocks that have return and volume data for more than 15 observations with which to estimate the above regression; we also exclude a stock for the first and last partial month that it appears on the CRSP tape. One special attention is deserved for Pastor and Stambaugh [35], who point out that we should also impose the screen $\nu_{i,d,t} > 0$, thereby excluding days with zero trading volume. This condition was inadvertently neglected to mention in the original paper [9].

Once we obtain liquidity measure $\gamma_{i,t}$, innovation in liquidity is constructed as follows:

$$\Delta\gamma_{t}= (\frac{m_t}{m_1}) \times \frac{1}{N}\sum_{i=1}^{N_t}(\gamma_{i,t} - \gamma_{i,t-1}),\ i = 1, \ldots , N_t \tag{2}$$

where m stands for market value of market, and scaling factor $\frac{m_t}{m_1}$ is meant to adjust inflation. We then regress market liquidity innovation $\Delta\gamma_t$ in an AR (1) model as follows:

$$\Delta\gamma_t= \alpha + \beta\Delta\gamma_{t-1}+c\left(\frac{m_t}{m_1}\right) \times \gamma_{t-1}+\varepsilon_t \tag{3}$$

We extract the fitted residual term ε_t from above regression and then define Pástor and Stambaugh's [9] market-wide liquidity risk L^{PS}_t as follows:

$$L^{PS}_t= \varepsilon_t/100 \tag{4}$$

3.3.2. Amihud's Liquidity Measure

Amihud [10] applies a different philosophy and defines illiquidity measure as average across stocks of the daily ratio of absolute stock returns to dollar volume. It serves as a rough measure of price impact because it can be interpreted as the daily price response associated with one dollar of trading volume. He finds market-wide shocks in illiquidity negatively affect stock's contemporaneous realized returns.

In calculating Amihud's illiquidity measure [10,22], we follow the convention by including common shares (CRSP share codes 10 and 11) only listed on NYSE and AMEX (CRSP exchange code 1 and 2). Following Amihud and Amihud and Noh [10,22], we first construct this illiquidity measure as follows:

For each stock i:

$$\mathrm{illiq}_{i,d,t} = |r_{i,d,t}|/\mathrm{dvol}_{i,d,t} \tag{5}$$

where $r_{i,d,t}$ and $\mathrm{dvol}_{i,d,t}$ are return and dollar volume of stock i on day d in month t. A stock is included if, during a 12-month period, its price is between USD 5 and USD 1000 and it has more than 200 days of valid return and volume data. We then estimate monthly illiquidity $\mathrm{ILLIQ}_{i,t}$, calculated for each stock i from daily return and volume data over a 12-month periods that ends in month t, as the average of daily value of $\mathrm{illiq}_{i,d,t}$. We exclude stocks whose $ILLIQ_{i,t}$ are at the highest or lowest 1% tails of the distribution to eliminate outliers. Once we have individual monthly $ILLIQ_{i,t}$, we will aggregate them to obtain market-wide monthly illiquidity $ILLIQ_t$. Specifically, it is calculated as month-t cross-stock, value-weighted, and the weights are the market capitalizations at the end of the preceding month.

We transform the resulting market-wide monthly series into logarithm and denote it as Log_ILLIQ_t. This series is analogous to $\gamma_{i,t}$ obtained from Pástor and Stambaugh's procedure [9]. The next task is to estimate market-wide liquidity risk, which is the unexpected components in market-wide liquidity. It is calculated by running an AR (2) model over a rolling window of 60 months that ends in month n:

$$Log\_ILLIQ_t = \alpha_0 + \alpha_1 \times Log\_ILLIQ_{t-1} + \alpha_2 \times Log\_ILLIQ_{t-2} + \alpha_3 \times T_t + \varepsilon_t \quad (6)$$

where T_t is the serial number of observations in order to account for a time trend. The shock in month n + 1 denoted $d\_Log\_ILLIQ_{n+1}$ is the difference between the actual value and its corresponding fitted value using the slope coefficients estimated over the previous 60 months. Our final unexpected liquidity components, which represents market-wide liquidity risk, is rescaling by negative one as we can thus make it comparable with L_t^{PS} we obtained before, as follows:

$$L_t^{A} = -1 \times d\_Log\_ILLIQ_t \quad (7)$$

We find that the pooled correlation between L_t^{PS} and L_t^{A} is only 0.006, suggesting that these two measures capture different aspects of liquidity and making them supplementary to each other.

3.3.3. Liquidity Risk Betas Estimations

We have constructed two market-wide liquidity risk measures, L_t^{PS} and L_t^{A}, and we employ the following OLS regression using the past 60 months of data to estimate two types of liquidity risk betas for each stock:

$$r_{i,t} = \beta_0 + \beta_i^{L} L_t + \beta_i^{M} MKT_t + \beta_i^{S} SMB_t + \beta_i^{H} HML_t + \varepsilon_t \quad (8)$$

where $r_{i,t}$ denotes stock's return, L_t is the market-wide liquidity risk, MKT, SMB and HML are the three factors of Fama and French [36]. By feeding L_t^{PS} and L_t^{A} into above regressions, respectively, we will end up with two sets of stock's liquidity risk betas, Beta_PS and Beta_A, serving as our two main dependent variables. We are aware that Pástor and Stambaugh [9] put a larger emphasis on predicted liquidity risk beta estimation compared with historical liquidity risk beta estimations. The reason we shift attention to the latter is because they find out historical betas do a better job than predicted betas when extending the timeline in a latter study [35].

3.4. Control Variables

We control for variables that have been shown to affect the CSR–risk relationship in prior studies. We first control for betting against beta measure (BAB) [37] as it most likely affects liquidity risk. It is also well documented in many studies that firm size has predictive power [38,39], hence we control for firm size, calculated as the log value of the total asset. We further control for other variables known to be associated with firm systematic risk: market-to-book ratio (MB), calculated as market value of equity divided by book value of equity; financial leverage (LEV), calculated as total long-term debts divided by total assets; and profitability, measured by return on assets (ROA). In addition, McAlister et al. [40] show that R&D expenditures have an impact on systematic risk, and we thus control for R&D, calculated as research and development expenses divided by total sales. Following prior literature, we also control for sales growth (SALEG) [41]. Finally, we control for investment opportunities by capital expenditure expense divided by total assets (CAPEX), and we control for the effect of corporate governance using the net score of KLD ratings in the governance area (GOV). All independent variables are lagged by one year except for GOV. All of our regressions include industry and year fixed effects. Our industry classification is based on the first two-digits of the SIC code.

3.5. Summary Statistics

Table 1 reports the summary statistics of variables used in our regression analyses. The sample firms have an average CSR net score of 0.458, CSR strengths score of 1.738, and a CSR concerns score of 1.281. One thing we should notice is that our main independent variable CSR net score ranges from −9 to 18 and it has a high standard deviation, both of which indicate our sample consists of a wide cross section of firms across the CSR spectrum. Moving on to control variables, the average firm in our sample has a firm-specific BAB of 1.426, a firm size of 7.689, a market-to-book ratio of 2.781, a financial leverage of 0.235, a return on assets of 0.031, a capital investment of 0.045, a sales growth of 0.085, and an R&D ratio of 0.065. The average of governance score is −0.212, indicating that, on average, the firms have more KLD concerns than strengths in this field.

In addition to the variables used in our baseline regression analysis, we also use the following variables in our supplementary analysis: On average, the sample firms have a quoted spread of 0.032, an effective spread of 0.009, a price impact of 0.012, measured by Amihud's price response [10], and a share turnover of 9.360, measured by volume divided by total shares outstanding. Inspired by Moshirian's et al. [11] external equity finance dependence, we construct CapitalDep, calculated as the sum of net equity issuance and net debt issuance divided by capital expenditures. It has a negative average of −0.001, indicating our sample firms do not rely heavily on external capital financing on average. However, it ranges from −1.646 to 1.158, generating a large dispersion for our further analysis.

Table 1. This table reports the summary statistics of liquidity risk measures, CSR measures, firm various characteristics, liquidity level, and external capital reliance.

Statistic	Min	Pctl(25)	Mean	Pctl(75)	Max	Median	St. Dev.
Beta_PS	−3.275	−0.169	−0.01	0.148	2.856	−0.012	0.295
Beta_A	−1.813	0.682	1.1	1.417	9.061	1.025	0.621
CSR_net	−9	−1	0.458	1	18	0	2.529
CSR_str	0	0	1.738	2	21	1	2.445
CSR_con	0	0	1.281	2	15	1	1.641
BAB	0.037	0.712	1.426	1.898	5.142	1.216	1.003
Size	4.183	6.516	7.689	8.73	11.926	7.586	1.606
MB	−10.106	1.222	2.781	3.305	22.853	1.949	3.652
LEV	0	0.068	0.235	0.349	0.918	0.211	0.198
ROA	−0.548	0.009	0.031	0.078	0.251	0.039	0.107
CAPEXP	0	0.013	0.045	0.061	0.263	0.031	0.048
SALEG	−0.511	−0.013	0.085	0.15	1.191	0.062	0.225
RNDR	0	0	0.065	0.033	1.917	0	0.229
GOV	−4	−1	−0.21	0	3	0	0.671
CapitalDep	−1.646	−0.003	−0	0.025	1.158	0.004	0.266
Quoted_spread	0.006	0.021	0.032	0.038	0.155	0.028	0.016
Effective_spread	0.002	0.006	0.009	0.011	0.05	0.008	0.005
Price_impact	0.00003	0.0003	0.012	0.005	3.927	0.001	0.075
Share_turnover	0.638	4.368	9.36	11.661	117.42	7.174	8.165
CapitalDep	−1.646	−0.003	−0	0.025	1.158	0.004	0.266

4. Univariate Analysis

Table 2 reports the mean (Table 2, Panel A) and median (Table 2, Panel B) liquidity risk betas of firms with low and high CSR net scores, respectively. The mean (median) liquidity risk, measured by Beta_A, of firms with a high CSR net score is 1.0870 (1.0185), while it is 1.1208 (1.0466) for firms with a low CSR net score. The results suggest that the mean (median) Beta_A of firms with a high CSR net score is 0.0338 (0.0281) lower than that of firms with a low CSR net score. These differences are significant at the 1% level. A similar pattern is observed for Beta_PS. These preliminary findings suggest firms with better CSR ratings have significantly lower liquidity risk.

Table 2. This table presents mean (Panel A) and median (Panel B) comparison tests for the liquidity risk estimations across subsamples of high (above median) and low (below median) CSR net score (CSR_net). Beta_A and Beta_PS are two liquidity risk measures based on Amihud [10] and Pástor and Stambaugh [9].

		N	Beta_A	Beta_PS
Panel A: Means				
CSR_net≥median	(1)	19,015	1.087	−0.0205
CSR_net<median	(2)	11,738	1.1208	−0.0016
Difference	(1)–(2)		−0.0338 ***	−0.0189 ***
t_Stat.			[−49.55]	[−44.67]
Panel B: Medians				
CSR_net≥median	(1)	19,015	1.0185	−0.0229
CSR_net<median	(2)	11,738	1.0466	0.0038
Difference	(1)–(2)		−0.0281 ***	−0.0267 ***
t_Stat.			[−47.10]	[−70.75]

The *, **, and *** marks denote significance at the 10%, 5%, and 1% levels, respectively.

5. Empirical Results

5.1. Baseline Regression Results

We test the proposed relation between CSR and firms' liquidity risk based on the baseline empirical model. We impose a one-year lag between the dependent and independent variables to test whether the lagged value of CSR affects the current liquidity risk. This setup ensures that CSR is the cause but not the consequence. We include industry (first two-digit SIC code) and year fixed effects since liquidity risk can be affected by its industry association and the time variation involved. We also cluster robust standard errors at the firm-level as follows"

$$\beta_t^L = \alpha_0 + \alpha_1 CSR_{net_{t-1}} + \alpha_2 BAB_{t-1} + \alpha_3 Size_{t-1} + \alpha_4 MB_{t-1} + \alpha_5 LEV_{t-1} + \alpha_6 ROA_{t-1} + \alpha_7 CAPEX_{t-1} + \alpha_8 SALEG_{t-1} + \alpha_9 RD_{t-1} + \alpha_{110} GOV_t + \alpha_m(DIndustry) + \alpha_n(DYear) + \varepsilon_t \tag{9}$$

We report the results from our baseline regressions in Table 3. We conduct univariate regressions in Models 1–2 by regressing liquidity risk betas on the lagged CSR net score, as well as the industry and time dummy variables. A significant negative relationship is observed for both Beta_A and Beta_PS, indicating that corporations with better socially responsible performance tend to have lower liquidity risk. To mitigate the systematic differences existing in a list of firm characteristics between low- and high-liquidity-risk firms, we conduct multivariate regressions in Models 3 to 6. In models 3–4, we investigate this relationship by controlling for a set of variables. We find that the coefficients on the CSR net score remain significantly negative for both of Beta_A and Beta_PS, while the coefficients on firm features are quite different. This is not beyond our expectation as we have shown Beta_A and Beta_PS contain very different information (a correlation of 0.006). Generally, larger and less profitable firms experience higher liquidity risk. The negative relationship between CSR and liquidity risk is also significant economically. On average, an increase of one standard deviation in CSR net score in year $t-1$ is associated with a decrease of 1.80% in Beta_A and 3.24% in Beta_PS in year t. Thus, the effect of CSR on liquidity risk is both statistically and economically significant. In Models 5–6, we investigate if strength and concern capture different dimensions and thus have different effect on future liquidity risk. We decompose the CSR net score into the CSR strength score and concern score, and we find that the coefficients on the CSR strength score are significantly negative while the coefficients on the CSR concern score are significantly positive. This means both the individual components are the driving force of the observed negative relationship in Models 3 and 4.

Table 3. The dependent variables in model 1 to model 8 are two liquidity risk betas, Beta_A and Beta_PS: In model (1) and model (2), we estimate univariate regressions. In model (3) and model (4), we control for various firm-level characteristics. In model (5) to model (8), we decompose CSR net scores into CSR strengths scores and concerns scores separately and re-run the regressions. Robust standard errors are corrected for firm-level clustering and heteroskedasticity.

	Dependent Variable:							
	Beta_A	**Beta_PS**	**Beta_A**	**Beta_PS**	**Beta_A**	**Beta_PS**	**Beta_A**	**Beta_PS**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Intercept	1.278 ***	0.092 ***	0.023	0.08	0.026	0.08	0.055	0.107
	[−0.054]	[−0.027]	[−0.135]	[−0.088]	[−0.135]	[−0.088]	[−0.135]	[−0.088]
CSR_net (t − 1)	−0.004 ***	−0.003 ***	−0.004 ***	−0.004 ***				
	[−0.001]	[−0.001]	[−0.001]	[−0.001]				
CSR_str (t − 1)					−0.003 **	−0.003 ***		
					[−0.001]	[−0.001]		
CSR_con (t − 1)							0.006 ***	0.004 ***
							[−0.002]	[−0.001]
BAB (t − 1)			0.381 ***	−0.006 ***	0.381 ***	−0.006 ***	0.381 ***	−0.006 ***
			[−0.003]	[−0.002]	[−0.003]	[−0.002]	[−0.003]	[−0.002]
AT (t − 1)			0.042 ***	0.005 ***	0.042 ***	0.006 ***	0.037 ***	0.001
			[−0.002]	[−0.001]	[−0.002]	[−0.002]	[−0.002]	[−0.001]
MB (t − 1)			−0.001	−0.001*	−0.001	−0.001 *	−0.001 *	−0.001 **
			[−0.001]	[−0.001]	[−0.001]	[−0.001]	[−0.001]	[−0.001]
LEV (t − 1)			0.160 ***	−0.0003	0.160 ***	−0.0004	0.164 ***	0.003
			[−0.016]	[−0.011]	[−0.016]	[−0.011]	[−0.016]	[−0.01]
ROA (t − 1)			−0.117 ***	−0.077 ***	−0.120 ***	−0.080 ***	−0.119 ***	−0.079 ***
			[−0.033]	[−0.022]	[−0.033]	[−0.022]	[−0.033]	[−0.022]
CAPEX (t − 1)			−0.03	0.066	−0.033	0.064	−0.037	0.06
			[−0.073]	[−0.048]	[−0.073]	[−0.048]	[−0.073]	[−0.048]
SALEG (t − 1)			0.001	−0.024 ***	0.0005	−0.024 ***	0.003	−0.022 ***
			[−0.012]	[−0.008]	[−0.012]	[−0.008]	[−0.012]	[−0.008]
RD (t − 1)			0.135 ***	−0.075 ***	0.134 ***	−0.076 ***	0.132 ***	−0.078 ***
			[−0.016]	[−0.01]	[−0.016]	[−0.01]	[−0.016]	[−0.01]
GOV			−0.015 ***	−0.005 *	−0.016 ***	−0.006 **	−0.016 ***	−0.007 **
			[−0.004]	[−0.003]	[−0.004]	[−0.003]	[−0.004]	[−0.003]
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	30,753	30,753	27,096	27,096	27,096	27,096	27,096	27,096
R^2	0.154	0.047	0.5	0.058	0.499	0.058	0.499	0.058
Adjusted R^2	0.151	0.044	0.498	0.055	0.497	0.054	0.498	0.054

The *, **, and *** marks denote significance at the 10%, 5%, and 1% levels, respectively.

5.2. Components Analysis

In this section, we examine the effect of individual categories of CSR on liquidity risk. In each of the categories, namely, community, diversity, employee relations, environment, human rights, and product, we compute the corresponding net score as the sum of strengths minus the sum of concerns. We rerun our baseline regression for each of the individual categories' net scores. We find the most of categories show a negative effect on liquidity risk in Table 4. For Beta_A, all coefficients are significantly negative except for human right and product. A similar pattern is observed for Beta_PS, however, the coefficient is significantly positive for product category, indicating that a higher product net score is associated with higher liquidity risk represented by Beta_PS. In addition, it shows that community category has largest negative effect on Beta_A while the environment category has the largest negative effect on Beta_PS. Overall, these results indicate that the observed negative relationships in Models 3–4 are not driven solely by any individual component but by a combined effect.

Table 4. The dependent variables in model (1) to model (12) are two liquidity risk betas, Beta_A and Beta_PS: We regress liquidity risk on each of the six individual categories including community, diversity, employee relations, environment, human rights, and products. We include all control variables, same as in Table 3. Robust standard errors are corrected for firm-level clustering and heteroskedasticity.

	Dependent Variable:											
	Beta_A	**Beta_PS**	**Beta_A**	**Beta_PS**	**Beta_A**	**Beta_PS**	**Beta_A**	**Beta_PS**	**Beta_A**	**Beta_PS**	**Beta_A**	**Beta_PS**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
Intercept	0.083	0.078	0.058	0.06	0.079	0.07	0.08	0.066	0.087	0.08	0.079	0.072
	[−0.137]	[−0.088]	[−0.137]	[−0.088]	[−0.137]	[−0.088]	[−0.137]	[−0.088]	[−0.137]	[−0.088]	[−0.137]	[−0.088]
COM (t − 1)	−0.022 ***	−0.008 **										
	[−0.005]	[−0.003]										
DIV (t − 1)			−0.008 ***	−0.006 ***								
			[−0.002]	[−0.002]								
EMP (t − 1)					−0.006 **	−0.007 ***						
					[−0.003]	[−0.002]						
ENV (t − 1)							−0.006 *	−0.012 ***				
							[−0.003]	[−0.002]				
HUM (t − 1)									−0.0002	−0.001		
									[−0.009]	[−0.006]		
PRO (t − 1)											0.007	0.008 ***
											[−0.004]	[−0.003]
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27,096	27,096	27,096	27,096	27,096	27,096	27,096	27,096	27,096	27,096	27,096	27,096
R^2	0.482	0.055	0.482	0.056	0.482	0.056	0.482	0.056	0.482	0.055	0.482	0.055
Adjusted R^2	0.48	0.052	0.48	0.052	0.48	0.052	0.48	0.053	0.48	0.052	0.48	0.052

The *, **, and *** marks denote significance at the 10%, 5%, and 1% levels, respectively.

5.3. Addressing the Endogeneity Concern

As suggested in related literatures [39,42], we are aware that our results can be biased by the endogeneity issue, and we thus conduct tests to address endogeneity concerns due to simultaneity, reverse causality, and omitted variables. We first include liquidity level as it can be correlated with both CSR and liquidity risk. We also employ two additional conventional methods, the instrumental variables method and the dynamic GMM method, to estimate the model. We now discuss these analyses in details.

Although we control for several important factors affecting the liquidity risk, our results on the importance of CSR to liquidity risk may be driven by omitted variables that are correlated with both CSR and the liquidity risk. In this study, we add the liquidity level to our model given that it can potentially affect both the CSR and the liquidity risk [43,44] To control for the liquidity level, we add quote spread, effective spread, price impact, and share turnover in the control group. Table 5 reports the results with the controls of liquidity risk. We find the coefficients remain significantly negative when controlling for liquidity level separately and together.

Table 5. The dependent variables in model (1) to model (10) are two liquidity risk betas, Beta_A and Beta_PS: In models (1) to (8), we re-run our baseline regressions controlling for each of liquidity level measures: quoted spread, effective spread, price impact, and share turnover. In models (9) and (10), we include all above liquidity-level measures. We include all control variables, same as in Table 3. Robust standard errors are corrected for firm-level clustering and heteroskedasticity.

	Dependent Variable:									
	Beta_A	**Beta_PS**	**Beta_A**	**Beta_PS**	**Beta_A**	**Beta_PS**	**Beta_A**	**Beta_PS**	**Beta_A**	**Beta_PS**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Intercept	−0.258 *	0.04	−0.206	0.044	0.071	0.048	0.041	0.058	−0.214	0.044
	[−0.136]	[−0.089]	[−0.137]	[−0.089]	[−0.137]	[−0.088]	[−0.136]	[−0.088]	[−0.136]	[−0.089]
CSR_net (t − 1)	−0.004 ***	−0.004 ***	−0.004 ***	−0.004 ***	−0.004 ***	−0.004 ***	−0.005 ***	−0.004 ***	−0.004 ***	−0.004 ***
	[−0.001]	[−0.001]	[−0.001]	[−0.001]	[−0.001]	[−0.001]	[−0.001]	[−0.001]	[−0.001]	[−0.001]
Q_spread (t − 1)	6.992 ***	0.403 **							9.969 ***	0.792
	[−0.290]	[−0.188]							[−0.809]	[−0.527]
E_spread (t − 1)			18.828 ***	1.028 *					−12.481 ***	−2.323
			[−0.945]	[−0.611]					[−2.596]	[−1.690]

Table 5. *Cont.*

	Dependent Variable:									
	Beta_A	**Beta_PS**	**Beta_A**	**Beta_PS**	**Beta_A**	**Beta_PS**	**Beta_A**	**Beta_PS**	**Beta_A**	**Beta_PS**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Price_impact (t − 1)					−0.074 *	0.124 ***			−0.188 ***	0.127 ***
					[−0.038]	[−0.024]			[−0.039]	[−0.026]
Turnover (t − 1)							0.007 ***	0.0002	0.004 ***	0.0003
							[−0.000]	[−0.000]	[−0.000]	[−0.000]
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27,088	27,088	27,088	27,088	27,088	27,088	27,088	27,088	27,088	27,088
R^2	0.493	0.056	0.49	0.056	0.482	0.057	0.489	0.056	0.497	0.057
Adjusted R^2	0.491	0.053	0.488	0.053	0.48	0.054	0.487	0.053	0.495	0.054

The *, **, and *** marks denote significance at the 10%, 5%, and 1% levels, respectively.

We next apply a two-stage least square method. Following prior study [15], we use the CSR net score lagged by 2 years as the instrumental variables of the CSR scores. We report results in columns (1) and (2) of Table 6. The coefficients on the fitted value of CSR net score are still significantly negative for both liquidity risk betas, suggesting our observed negative relationship in our baseline regressions holds when addressing for possible endogeneity. We also use the average CSR net score of other firms in the same Fama–French 48 industry as the instrument variables [13,20] and the results are less but still significant (results untabulated).

Table 6. The dependent variables in model (1) to model (4) are two liquidity risk betas, Beta_A and Beta_PS: In models (1) and (2), we apply a two-state lease square method and we use the CSR net score lagged by 2 years as the instruments following prior studies (e.g., Cai et al., 2016). In models (3) and (4), we employ dynamic GMM method and use the first two lags of the liquidity risk to account for the dynamic aspects of the CSR–liquidity risk relation. We include all control variables same as in Table 3. Robust standard errors are corrected for firm-level clustering and heteroskedasticity.

	Dependent Variable:			
	Beta_A	**Beta_PS**	**Beta_A**	**Beta_PS**
	(1)	**(2)**	**(3)**	**(4)**
Constant	0.019	0.078	−0.038	0.117
	[−0.135]	[−0.088]	[−0.139]	[−0.091]
CSR_net fitted (t − 1)	−0.005 ***	−0.004 ***		
	[−0.001]	[−0.001]		
CSR_net (t − 1)			−0.004 ***	−0.003 ***
			[−0.001]	[−0.001]
Beta_A (t − 1)			−0.033 **	
			[−0.015]	
Beta_A (t − 2)			0.008	
			[−0.015]	
Beta_PS (t − 1)				−0.022 ***
				[−0.007]
Beta_PS (t − 2)				0.005
				[−0.006]
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
Observations	27,096	27,096	26,219	26,219
R^2	0.5	0.058	0.5	0.06
Adjusted R^2	0.498	0.055	0.498	0.056

The *, **, and *** marks denote significance at the 10%, 5%, and 1% levels, respectively.

Second, to mitigate the issue of reverse causality, we conduct the dynamic panel system GMM model [45,46]. We employ the first two lags of the liquidity risk because including past liquidity risk levels enables us to account for the dynamic aspect of the CSR–liquidity risk relationship. The results in columns (3) and (4) of Table 6 suggest that we continue to find a significantly negative relationship. Overall, these analyses reinforce our previous findings of a negative association between CSR and the liquidity risk. Collectively, these results indicate that our core results are not driven by an endogeneity issue.

5.4. Exploring the Underlying Mechanism

In this section, we explore the underlying economic channel through which CSR affects liquidity risk. When market-wide liquidity experiences a negative shock, the unexpected shortage in market liquidity has a detrimental effect on firm's operation. Insufficient access to capital has an adverse effect on firms, exhausting their internal capital and deteriorating their operating performance, both of which may drive down the stock price. This is how firms' stock returns covariate with market-wide liquidity shocks.

Many empirical evidences [47,48] favor a stakeholder maximization view suggesting that CSR firms pay special attention to stakeholders' interest and satisfaction. Focusing on the well-being of stakeholders increases stakeholders' willingness to offer the firms with critical resources or effort to support firms' operation. Banks and investors serve as important stakeholders of firms and they provide capital for firm's operation. During the liquidity crisis, banks and investors are more likely to supply capital to socially responsible firms as these firms used to be kind to them and care about their well-being. In addition, firms with intensive CSR engagement tend to have financial and operation transparency. CSR serves as a tool for banks and investors to build trust, especially during a liquidity crisis. Combing both factors that contribute to the access to capital, socially responsible firms are more likely to be supplied with capital by such stakeholders to support operations and prevent their stock prices from going down. Under this scenario, we expect the returns of socially responsible firms will be less affected by market liquidity shocks and hence they have a lower liquidity risk represented by liquidity risk betas.

In order to test the above hypothesized mechanism, we argue that the negative relationship between CSR and the liquidity risk is more pronounced for firms with higher external capital reliance. This is because firms with higher external capital reliance have less internal capital during liquidity shortage periods. Therefore, the benefits associated with CSR engagements are pronounced for them. We expect the negative relationship between CSR and the liquidity risk is more prominent for firms that heavily rely on external financing.

Following Moshirian et al. [11], we measure external capital finance reliance using the sum of net equity issuance and net debt issuance dividend by capital expenditure. We rerun our baseline regression after portioning the sample based on the median values of the external capital finance reliance. We report the results in Table 7. We find significantly negative coefficients on the CSR net score for both of the liquidity risk betas when firms have high external capital finance reliance. In contrast, when firms have low external capital finance reliance, the coefficient is insignificant for Beta_A and the coefficient is less statistically negative for Beta_PS compared with its counterparty when firms have high external capital finance reliance.

We further foucs on the regional trust level to present a contextual backgroud and investigate the differential effect of CSR on liquidity risk at regions with different trust levels. Firms located at trustworthy regions enjoy advantages in access to finance, obtaining capital at lower price and withstanding risk. When the trustworthy appearance of a region is lacking, the moral capital accumulated by the individual firms should be valued more by outsiders. In the context of our study, the effect of individual firm's CSR performance on the liquidity risk should be more pronounced when the regional trust level is low.

Table 7. This table presents the regression results of subsample analysis on the effect of CSR scores on firm-level liquidity risk: We partition the sample based on the median value of external capital finance dependence (CapDep), calculated as sum of net equity issuance and net debt issuance divided by capital expenditure. We include all control variables same as in Table 3. Robust standard errors are corrected for firm-level clustering and heteroskedasticity.

	Dependent Variable:			
	High Reliance	**Low Reliance**	**High Reliance**	**Low Reliance**
	(CapDep ≥ Median)	**(CapDep < Median)**	**(CapDep ≥ Median)**	**(CapDep < Median)**
	(1)	**(2)**	**(3)**	**(4)**
Intercept	−0.075	0.338 *	−0.158	0.324 ***
	[−0.194]	[−0.199]	[−0.133]	[−0.124]
CSR_net (t − 1)	−0.011 ***	−0.002	−0.005 ***	−0.003 *
	[−0.002]	[−0.002]	[−0.001]	[−0.001]
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
Observations	11,654	11,479	11,479	11,654
R^2	0.53	0.499	0.062	0.088
Adjusted R^2	0.526	0.495	0.054	0.08

The *, **, and *** marks denote significance at the 10%, 5%, and 1% levels, respectively.

We obtain the state-level trust data from the US section of World Values Survey data. In the survey, the trust-related questions (V24, V103, V104, V105, and V160B) ask about interviewees' trust level towards their family, neighborhood, and various types of people. We recode the answer variables so that lower values would reflect lower trustworthiness. Then, we calculate the mean of the scores across the five questions as the social trust score for a particular respondent. We obtain the mean value of each variable by state (V246B) as the trust measures. We merge the trust data with the sample based on firm's location (state) and perform the regression after portioning the sample according to the median values of trust score. We report the results in Table 8. Consistent with our prediction, we find more statistically significant negative coefficients on the CSR net score for both liquidity risk measures when firms operate in low-trust areas.

Table 8. This table presents the results of the differential effect of CSR on liquidity risk at the regions with different trust level: We partition the sample based on the median value of state-level trust score. We include all control variables same as in Table 3. Robust standard errors are corrected for firm-level clustering and heteroskedasticity.

	Dependent Variable:			
	High Trust	**Low Trust**	**High Trust**	**Low Trust**
	Beta_A	**Beta_A**	**Beta_P**	**Beta_PS**
	(1)	**(2)**	**(3)**	**(4)**
Intercept	−0.142	0.348	0.223	−0.038
	[0.418]	[0.101]	[0.112]	[0.738]
CSR_net (t − 1)	−0.004 *	−0.005 **	−0.003 **	−0.004 ***
	[0.024]	[0.003]	[0.009]	[0.000]
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
Observations	15,774	10,962	15,774	10,962
R^2	0.50	0.52	0.07	0.07

The *, **, and *** marks denote significance at the 10%, 5%, and 1% levels, respectively.

6. Summary and Conclusions

In this paper, we investigate the influence of CSR on firm liquidity risk using a comprehensive sample of U.S. firms from 1993 to 2018. We find a significantly negative association between firm's CSR performance and the liquidity risk after controlling for various firm-specific determinants, as well as industry and year fixed effects. Our results remain intact when addressing for endogeneity issues by adding liquidity level to the model and employing the two-stage least square method and the dynamic GMM method. Furthermore, we find that external capital finance is the economic channel through which CSR could affect a firm's liquidity risk as the negative relationship between CSR and the liquidity risk is more prominent when firms heavily rely on external capital finance. The rationale behind this observation is that investors and banks are more likely to supply capital to firms with previously intensive CSR engagements during market liquidity shocks because of the "payback" effect and the trust-building resulted from previous CSR engagements. The results also suggest that the effect of CSR on liquidity risk is more pronounced when the firms operate in the states with low trust level.

Our study makes several contributions. Our findings lend strong support for the argument that firms could invest in CSR for risk mitigation. We extend the study of the relation between CSR and systematic risk and show that the risk-reducing effect of CSR is in line with the current studies between CSR and firm risk. This paper fills a gap in the literature of risk management by formalizing and testing whether and to what extent CSR policies affect the critical component of systematic risk, liquidity risk, which has been widely accepted as a prominent systematic risk across stocks. We also contribute to the stream of literature on the determinant of systemic risk given that the recent financial crisis and pandemic crisis have demonstrated that market liquidity is a prominent systematic risk globally. Our study indicates that CSR investment could serve as an instrument in the systemic risk mitigation. The paper also contributes to the literature by offering the dynamic GMM method that attempts to deal with the potential endogeneity of CSR.

Our findings shed light on investment decisions and risk management and therefore are very important for firms and investors. From the firm's perspective, with the mechanism explained in the previous section, corporate managers can identify the implications of active CSR management. They may make strategic decisions on CSR engagement, which will affect their trustworthiness with stakeholders and the capital-raising ability during market liquidity shortage periods. These strategic decisions on CSR engagement will serve as a tool to manage firm's liquidity risk. From an investor's perspective, our findings between CSR and liquidity risk have implications for portfolio construction and investment decisions. For example, CAPM predicts that any systematic fluctuation of asset prices is captured solely by market risk. Therefore, the covariance of stock returns with market returns is the key to the success of portfolio diversification. This liquidity risk, which is independent of market risk, provides an additional layer to consider when investors seek to diversify away risks. Therefore, CSR performance can be used to evaluate individual stocks' or portfolios' liquidity risk exposure or even to predict liquidity risk and the change in the liquidity risk of the underlying investments.

Although our research provided novel evidence and generated critical implications for both academic researchers and practitioners, we recognize that this article is not without weakness. We limit our study to the firms in the US. We believe that extending our study on a global basis may enrich and contribute the documented mitigating effect of CSR on firm's liquidity risk. In addition, though the existing studies suggest that CSR is more prominent in developed countries, the developing countries also require elaborate efforts. We notice that there are some extended studies that focus on the CSR effect in developing countries [49]. We believe our findings also have academic implications for developing countries. Further studies regarding the impact of sustainability issues including CSR implementation on risk management could be undertaken in developing countries. Noteworthy CSR performance induces moral capital, but the effect of CSR may differ in culturally heterogeneous nations. In addition, the legal and regulation systems in financial markets may also differ; this is especially distinct between developed and developing nations. Hence, investors in each market may perceive liquidity risk differently, which also influence the CSR effect on liquidity risk. Extending the study on a global basis would confirm the robustness of the documented relationship. It would be also rewarding to investigate how this documented relationship will vary across countries, especially the difference between developed and developing countries. We encourage scholars to answer these questions in the future.

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