Macroeconomic Uncertainty, Corporate Social Responsibility, and Firm Cultures

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Abstract

We examine the impact of firm cultures on corporate social responsibility under macroeconomic uncertainty. Our results suggest that firms increase CSR disclosure transparency under high economic policy uncertainty, with disproportionate responses in different reporting categories. Cost of capital plays the impeding role, while analyst coverage, litigation risk, and dividend payout policy encourage firms to participate in CSR reporting. Firms intend to discuss more on social topics in their CSR reports when facing high uncertainty. We highlight the importance of corporate cultures in CSR disclosures. Firms with good innovation and quality intend to engage more in CSR reporting, while under macroeconomic uncertainty, integrity, teamwork, respect and quality enhance firms' capability, allowing firms to respond mildly via CSR reporting.

Keywords: Economic Policy Uncertainty, Corporate Social Responsibility, Corporate Culture.

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1. Introduction

In the contemporary economic landscape, government actions, spanning taxation, subsidies, regulatory frameworks, and enforcement of laws, significantly shape the operational environment for businesses, influencing key economic variables such as investment, consumption, and employment. In 2013, McKinsey[1] estimated that about 30 percent of earnings for companies in most industries are at stake from policy outcomes. The significant impact of policies stimulates scholarly inquiry into how firms navigate macroeconomic uncertainties through information disclosures (Nagar, Schoenfeld, and Wellman (2019);Choi, Gallo, Hann, and Kim (2021)). This paper aims to extend the literature by exploring the dynamics of Corporate Social Responsibility (CSR) transparency amidst economic policy uncertainties. The focal point of this research merits scholarly attention due to its embodiment of disclosures concerning externalities, contrasting with traditional voluntary disclosures that primarily convey financial information. CSR disclosures offer insights into how companies address and manage their broader impacts on society and the environment during uncertain economic times, providing a more comprehensive understanding of a firm's resilience and strategic priorities beyond financial metrics.

Fist, we focus on the benefit of reporting CSR. CSR activities can be costly to shareholders, and firms often use debt to finance CSR activities (see, e.g., Dhaliwal, Li, Tsang, and Yang, 2011). Given the extra cost from CSR disclosures, the benefit of the disclosures should be outstanding. We study the impact of CSR reporting by examining whether CSR reporting increases shareholder value in the long run. Our results suggest that cumulative abnormal returns are significantly associated with CSR reporting transparency. CSR reporting is more valuable to firms when the macroeconomic uncertainty is high, reconciling with the strand of literature that studies the "insurance" effect of CSR against adverse events (see, e.g., Janney and Gove, 2011; Lin, Tan, Zhao, and Karim, 2015; Christensen, 2016; Albuquerque, Koskinen, Yang, and Zhang, 2020).

Next, we investigate the impact of Economic Policy Uncertainty (EPU), an index widely accepted by economic and finance literature to proxy for economic policy uncertainty (see, e.g., Baker, Bloom, and Davis, 2016), on Corporate Social Responsibility disclosure transparency. We consider CSR disclosures from five dimensions: whether the firm publishes CSR report, whether the CSR report follows the Organization for Economic Cooperation and Development (OECD) guidelines, whether the report covers a global scope, whether the report is compliant with Global Reporting Initiative (GRI), and whether the report is

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[1]Article available at `https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/organizing-the-government-affairs-function-for-impact`

audited. In our setting, EPU is regarded as an exogenous shock as an economic policy stems from a multi-faucet decision model—the determination of U.S. economic policy is a complex process influenced by a variety of factors, including but not limited to political factors, partisanship, government budget, social movements, international factors, technological changes, economic conditions, and business activities, arguably unrelated to firm-level factors. Our results suggest that EPU is positively associated with CSR reporting transparency, indicating that when the macroeconomic uncertainty is high, firms tend to increase their CSR disclosures. However, the impact from EPU on CSR is not universal across all CSR reporting categories. High macroecnomic uncertainty encourages firms to publish their CSR reports at a basic level and from a global perspective. Meanwhile, the impact on following guidelines from organization and applying external audit is weak.

However, even though shareholders receive significant benefits from CSR reporting, many firms still choose not to report CSR to mitigate economic policy uncertainty or not report at maximum transparency. We consider the following factors that affect CSR disclosures: implied cost of capital, analyst coverage, corporate litigation risk, and dividend policy. We investigate the impact of these factors on the action of CSR reporting and firms' behaviour in high macroeconomic uncertainty.

Our results show that the *ex-ante* cost of capital impedes the effect of EPU on CSR reporting transparency. Although CSR reporting transparency increases with increasing EPU, the magnitude of the reaction is hindered by firms' *ex-ante* cost of capital. Meanwhile, firms which have high analyst coverage, high litigation risk, high dividend payouts tend to react sharply during the period of high macroeconomic uncertainty, increasing their CSR reporting transparency and decreasing the information asymmetry.

Besides firm financial characteristics, we also take firm cultures into consideration. Following the approach proposed by Li, Mai, Shen, and Yan (2021), we study the impacts of integrity, teamwork, innovation, respect, and quality. Our results suggest that innovation and quality cultures encourage firms to increase their CSR reporting. Firms with good integrity, teamwork, respect, and quality show mild response to the high macroeconomic uncertainty, suggesting that the impact of CSR reporting transparency is marginal.

This paper adds evidence to the growing research on how firms react to macroeconomic factors with voluntary disclosures. For example, Nagar et al. (2019) examine the effect of economic uncertainty on the firm and find that firms strategically respond to information asymmetry induced by economic policy uncertainty with increased voluntary disclosures. Choi et al. (2021) examine whether timely firm-specific disclosure complements subsequent macroeconomic news to help resolve investor uncertainty. They find firms experience greater uncertainty resolution around FOMC announcements by voluntary 8K filing and press re-

leases. Our study complements this literature by showing that firms increase CSR disclosure transparency to accommodate economic policy uncertainty. This finding is important because prior literature focuses more on firm-level financial disclosures and firm-specific risks that are short-term oriented. The results suggest that firms also respond by providing long-term oriented information more relevant to the stakeholders and society, expanding the horizon of the current empirical results.

This paper also complements the prior research on the relation between disclosures and firm characteristics. Firms with *ex-ante* high cost of capital may strategically choose to voluntarily disclose information, reduce information asymmetry, improve risk-sharing, and ultimately reduce the cost of capital (Dhaliwal et al. (2011)). Our results show that in the case of economic uncertainty, a high *ex-ante* cost of capital may impede a firm's disclosure transparency, suggesting a more nuanced relationship between voluntary disclosures and cost of capital. We also extend the current literature by introducing firm cultures into the study. Firms choose to increase CSR reporting transparency during high EPU period, while good establishment of firm cultures contributes in the way, hindering the motivation to file CSR reporting.

The remainder of this paper is organized as follows: Section 2 presents the background and motivates the hypotheses. Section 3 describes the data and methodology. Section 4 discusses the empirical results. Section 5 concludes.

2. Background and Hypothesis Development

The government shapes business operations' environment in the modern economy through various policies, including taxes, subsidies, regulations, and law enforcement. As a result, the market responds to policy changes based on anticipation and policy surprise. Pastor and Veronesi (2012) analyze the interplay between policy changes and stock price movements. In their Model, a key feature is that investors are uncertain about whether the policy will change and how it will affect the target firm's profitability. The model specification suggests that policy uncertainty can be an exogenous shock to individual firms. Nagar et al. (2019) take on the task and find that policy uncertainty is associated with increased information asymmetry, which forces managers to respond by increasing their voluntary disclosures.

Managers' disclosure response to EPU may extend to CSR disclosures. The CSR good governance view argues that firms with better CSR practices align the maximization of shareholder wealth with achieving broader societal goals (Ferrell, Liang, and Renneboog (2016)). Luo and Bhattacharya (2009) find that CSR exposure generates a "moral capital," such as customer trust, employee loyalty, and regulator relationships, and reduces firm idiosyncratic

risk, in line with maximizing shareholder value. Since CSR performance is negatively related to firm risk and the cost of capital, managers are incentivized to engage in CSR activities and promote CSR reporting when policy uncertainty increases investor risk premium and cost of capital.

On the other hand, related research shows mixed results on whether the dollars spent on CSR activities and reporting are in the best of shareholders' interest. For example, Di Giuli and Kostovetsky (2014) find that firms with Democratic decision-makers spend significantly more on CSR activities. The expenditures are not justified by future sales growth, and the managers are over-investing in CSR for potential personal gains at the expense of firm value, pointing directly to an agency problem. Barnea and Rubin (2010) support the agency cost theory, finding insider ownership negatively associated with CSR ratings. Therefore, when economic uncertainty is high, firms may opt out of CSR reporting as the market anticipates firms to distribute their resources with discretion. Also, given managers already have other voluntary disclosures that are more prominent with the firm's operations as a tool to mitigate policy uncertainty (Nagar et al. (2019)), it is unclear whether the managers would still incorporate CSR reporting with a reducing marginal benefit.

The above reasoning suggest that the relationship between EPU and CSR disclosures is ambiguous. We posit that the increase in economic uncertainty raises the relevance of non-financial disclosures, and firms respond by increasing the scope of CSR disclosures. Thus we posit the following hypothesis:

H1: Economic policy uncertainty is positively associated with the firm's CSR disclosure transparency.

Next, we consider whether firm characteristics such as the *ex-ante* cost of capital are related to the firm's reaction to economic uncertainty. As a form of voluntary disclosures, CSR reporting should, in theory, benefit firms by reducing information asymmetry and lowering the cost of capital (Christensen, Hail, and Leuz (2021)). Also, the capital market equilibrium model of Merton et al. (1987) states that investors must be aware of the firm before investing in the company. Signaling through CSR will raise investor awareness, increase the investor base and risk sharing, and, as a result, lower the cost of capital. Empirically, Hong and Kacperczyk (2009) find that "sin" stocks receive less attention from norm-constrained institutional investors and analysts, leading to a higher cost of capital. Therefore, firms with *ex-ante* high cost of capital may be incentivized to respond stronger to economic uncertainty with CSR engagement. Nevertheless, it is also possible that the *ex-ante* cost of capital will hinder the effect of economic uncertainty on CSR engagements. Dhaliwal et al. (2011) find CSR report initiators have higher leverage than non-initiators, implying firms, on average, tend to fund CSR engagements with debt. However, debt financing might have difficulty

under rising economic uncertainty because of increasing default risk (Greenwald and Stiglitz (1990). Indeed, Xu (2020) finds that EPU is positively associated with the firm-level cost of debt. With an *ex-ante* high cost of equity capital, the firm may choose not to increase CSR engagements under high economic uncertainty due to the lack of funding. Therefore, whether the cost of capital is related to the relationship between economic uncertainty and CSR reporting is an empirical question. I state my second hypothesis as follows:

H2: Firms' ex-ante cost of capital is negatively associated with the manager's CSR reporting reaction to economic policy uncertainty.

Two opposing views regarding the relationship between corporate governance and CSR engagements exist. The good governance view deems CSR as value-maximizing business activities and that firms engage in CSR "do well by doing good." (see, e.g., Flammer, 2013; Servaes and Tamayo, 2013; Krüger, 2015). With better-governed firms, managers better align their interests with the shareholders. As a result, managers are better incentivized to improve organizational resource allocation under economic uncertainty and increased risk and engage more in value-creating CSR activities. In contrast, the agency cost view considers CSR activities detrimental to shareholder value and that managers extract personal benefits from CSR activities at the expense of shareholders (Jensen and Meckling (1976)). Therefore, better-governed firms give managers fewer incentives and opportunities to engage in value-decreasing CSR activities under economic uncertainty. Literature documents the link between governance and corporate cultures (see, e.g., Aggarwal, Schloetzer, and Williamson, 2019). Guiso, Sapienza, and Zingales (2015) present the value of corporate culture and state the relationship between governance structure to sustain corporate culture. Given the above consideration, we posit the following hypothesis:

H3: Firms' corporate cultures are positively related to CSR reporting but negatively affect firms' CSR responses toward economic uncertainty.

3. Data and methodology

We obtain the data on CSR reporting and activities from Thomson Reuters ASSET4. Our sample ranges from 2004 to 2021, including 9,818 firms and 73,340 firm-year observations.

ASSET4 is among academic research's most popular CSR databases (de Villiers, Jia, and Li (2022)), providing a granular measure of a firm's CSR reporting and activities. Following Fiechter, Hitz, and Lehmann (2022), we build a comprehensive CSR score, capturing various dimensions of the firm's CSR reporting. The variable is the sum of five indicator variables representing the existence of a stand-alone CSR report (*Report*), whether the report is at a global scope (*Global*), whether the firm adopts the principles of Global Reporting Initiative

(GRI), whether the firm adopts the guidelines developed by the Organization of Economic Co-operation and Development ($OECD$), and whether the report is reviewed by independent third-party experts ($Assurance$).

Naturally, the value of the primary CSR score(CSR), ranges from 0 to 5 and is determined by how many of the five indicator variables the firm checks. For instance, if a firm issues an audited global-level CSR report without following GRI or OECD guidelines, the firm would have a CSR score of 3. By comprehensively capturing multiple dimensions of the firms' CSR reporting, I can better capture the underlying CSR activities and mitigate the concern of firms issuing reports for signaling without materially increasing their CSR engagements, i.e., greenwashing.

Our main proxy for economic uncertainty is the EPU index developed by Baker et al. (2016)[2], reflecting the frequency of articles in 10 leading US newspapers that contain keywords related to economic policy uncertainties. The index spikes around major economic and political events in the past 20 years. It is associated with future declines in macroeconomic matrices and reduced investment and employment in policy-sensitive sectors at the firm level. As Nagar et al. (2019) noted, Baker et al. (2016) find the EPU index correlated with general market uncertainty and, therefore, should be paired with proxies capturing equity uncertainty in a multivariate regression. we include a contemporaneous VIX index to moderate the concern. Both indices are at the daily level, and I compute the average over the observation year in my yearly analyses.

We perform a cross-sectional analysis of the association between CSR reporting and the EPU index based on the firm's *ex-ante* cost of capital. For the proxy for the cost of capital, we rely on the four most commonly used accounting-based implied cost of capital methodologies (see, e.g., Claus and Thomas, 2001; Gebhardt, Lee, and Swaminathan, 2001; Easton, 2004; Ohlson and Juettner-Nauroth, 2005). These approaches build on discounted dividend models and obtain the cost of capital as the internal rate of return derived from the actual share price. To mitigate the concern about measurement errors in individual measures, I use the yearly average of the four models as my main proxy for the cost of capital.

Our analysis includes firm characteristics variable as controls. Following Baker, Stein, and Wurgler (2003) and Cheng, Ioannou, and Serafeim (2014), we use the KZ index (Kaplan and Zingales (1997)) to proxy for financial constraints. The index is calculated as follows:

$$KZ = -1.002 \frac{CF_{i,t}}{A_{i,t-1}} - 39.368 \frac{DIV_{i,t}}{A_{i,t-1}} - 1.315 \frac{C_{i,t}}{A_{i,t-1}} + 3.139 \frac{LEV_{i,t}}{A_{i,t-1}} + 0.283 Q_{i,t}$$

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[2]Data available at `https://www.policyuncertainty.com/`

where $CF_{i,t}$ is income before extraordinary items, depreciation, and amortization, $DIV_{i,t}$ is cash dividends, $C_{i,t}$ is cash balances, $A_{i,t-1}$ is lagged total assets, $LEV_{i,t}$ is firm leverage, and $Q_{i,t}$ is the natural logarithm market value of equity. Higher values of the KZ index imply that the firm is more capital-constrained.

CSR engagement provides a "moral insurance" for firms as a buffer against future adverse events (Janney and Gove (2011); Christensen (2016)). Recent literature provides evidence that CSR engagement is negatively associated with litigation risks (Chakraborty, Gao, and Musa (2023); Freund, Nguyen, and Phan (2023)). Therefore, we control for *ex-ante* corporate litigation risk following the Model (3) of Kim and Skinner (2012),

$$
\begin{aligned}
Legal = -7.883 &+ 0.566 \cdot FPS_t + 0.518 \cdot \ln(\text{Asset}_{t-1}) \\
&+ 0.982 \cdot \text{Sales Growth}_{t-1} + 0.379 \cdot \text{Momentum}_{t-1} \\
&- 0.108 \cdot \text{Ret Skew}_{t-1} + 25.635 \cdot \text{Ret S}_{t-1} + 0.07 \cdot \text{Turnover}_{t-1}
\end{aligned}
$$

where FPS_t equals one if the firm is in the biotech (SIC codes 2833–2836 and 8731–8734), computer (3570–3577 and 7370–7374), electronics (3600–3674), or retail (5200–5961) industry, and 0 otherwise; $\ln \text{Asset}_{t-1}$ is the natural log of total assets and the end of year $t-1$. $SalesGrowth_{t-1}$ is year $t-1$ sales less year $t-2$ sales scaled by the beginning of year $t-1$ total assets. $Momentum_{t-1}$ is the market-adjusted 12-month stock return for year $t-1$. $RetSkew_{t-1}$ and $RetSD_{t-1}$ are the return skewness and standard deviation of the 12-month return for year $t-1$. $Turnover_{t-1}$ is the accumulated trading volume over the 12-month period for year $t-1$ scaled by the total shares outstanding at the beginning of the year.

For firm-level controls, we collect financial statement information from COMPUSTAT, equity trading information from CRSP, and forecast and analyst data from I/B/E/S. I eliminate closed-end funds, REITs, and ADRs by requiring "shrcd $\leq$ 12" from CRSP data and restrict our sample to firm years with at least a \$1 average stock price to avoid the impact of small and illiquid firms. Corporate culture data is collected from Li et al. (2021).

[Insert Table 1 near here]

[Insert Figure 1 near here]

All variables we used in this paper are explained in the Appendix. The summary statistics are displayed in Table 1. We can see from Panel A that the number of firms that choose to report CSR is increasing and the percentage of firms that report CSR is inceasing as well. However, Panel B states that most firms just report CSR at a low level that the mean value of CSR score is only 0.29, indicating that althoung firms report CSR, they fulfill the basic requirement but refuse to report at higher levels. Figure 1 shows a similar pattern.

Figure 1(a) shows an increasing trend in the full sample with all firms, which presents that the participation in CSR reporting is increasing. However, when we further study the participation in Figure 1(b), the average CSR score reaches its peak at around 3, implying that very few firms choose to report at advanced levels.

4. Empirical results

4.1. EPU and CSR Engagement

We begin the empirical analyses by investigating whether economic uncertainty is associated with firms' CSR disclosures. We control for common factors recognized by the literature that affect a firm's voluntary disclosures, including information environment (size and analyst following), growth opportunities (market-to-book ratio), agency cost (KZ index and leverage), and information asymmetry (stock return momentum, return volatility, and bid-ask spread). In addition, we include litigation risk (Kim and Skinner (2012)) and the economic determinants of CSR expenditures identified by Lys, Naughton, and Wang (2015), including *Cash, ROA, R&D,* and *Advertising.* We include firm fixed effects in all regressions. Considering the following model:

$$Disclosure_{i,t} = \alpha_i + \delta_1 EPU_{t-1} + \Upsilon_i \text{Controls}_{i,t-1} + \varepsilon_{i,t} \tag{1}$$

where $Disclosure_{i,t}$ stands for disclosure proxies for firm i in year t, and γ represents vectors of control variables and firm/year fixed effects. I estimate Eq. 1 using OLS regression and heteroskedasticity-robust standard errors clustered at the industry (3-digit SIC) and year level. Control variables are denoted in Table 2. All control variables are winsorized at the 99% level to ensure that the results are not driven by extreme values.

[Insert Table 2 near here]

Table 2, column 1 reports positive and significant coefficients on the EPU index, suggesting that managers respond to EPU trends by increasing the scope of CSR. A one-unit increase in prior-year EPU is associated with a 0.241 increase in CSR score.We decompose the CSR score into its components in columns 2 to 6. The coefficients of EPU are significantly positive for all components of CSR reporting. We also find that CSR reporting in the previous year has great impact on current CSR reporting, implying that firms keep consistency once they start to report.

Consistent with the hypothesis, firms increase CSR engagements on average under high economic uncertainty. It is worth noting that the economic scale of the estimated coefficients is likely to be around the lower bound because of the inclusion of smaller firms in the sample.

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A significant portion of the sample are smaller firms that never issued a stand-alone CSR report—the firm-year observations that include a CSR report only take 15% of the sample. The managers of such firms are not likely to change their CSR engagements in response to economic uncertainty. Since we use an equal-weighted approach, the economic significance of the estimated coefficients is reduced by these smaller firms.

4.2. CSR and Cumulative Abnormal Returns

One strand of literature focuses on the "insurance" function of CSR reporting and engagements (Christensen et al. (2021)). The general finding is that the reputation or goodwill built from CSR can help the firm endure losses against adverse events, such as corporate scandals (Christensen (2016)) and market crashes (Albuquerque et al. (2020)). We reconcile with these findings by testing whether CSR reporting intensity helps mitigate the adverse effects of high economic uncertainty by considering the following regression:

$$CAR_{i,t} = \alpha_i + \delta_1 CSR_{i,t-1} + \delta_2 EPU_{t-1} + \Upsilon_i \text{Controls}_{i,t-1} + \varepsilon_{i,t} \tag{2}$$

where $CAR_{i,t}$ stands for the cumulative market-adjusted return of the subsequent year of the CSR report.

[Insert Table 3 near here]

Table 3, column (1) reports the regression results for the full sample. Cumulative abnormal returns are positively associated with CSR, suggesting the benefit of corporate CSR reporting Columns (2) and (3) report the regression results after interacting two uncertainty measures with CSR, respectively. Uncertainty significantly decreases cumulative abnormal returns. However, CSR reporting is a method to alleviate the negative impact of market uncertainty. Both interaction terms have significant and negative signs, suggesting that by CSR reporting, the negative impact from uncertainty is diminished. The results indicate that CSR acts as a buffer against economic uncertainty, especially when the uncertainty is high, resonating with previous findings (Christensen, Hail, and Leuz (2016); Albuquerque et al. (2020)).

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4.3. Impact of Firm Characteristics

To test the effect of the cost of capital over the positive relationship between EPU and CSR, we consider the following model:

$$
\begin{aligned}
CSR_{i,t} = \alpha_i &+ \delta_1 EPU_{t-1} + \delta_2 Firm\ Characteristics_{i,t-1} \\
&+ \delta_3 Firm\ Characteristics_{i,t-1} \cdot EPU_{t-1} + \Upsilon_i Controls_{i,t-1} + \varepsilon_{i,t}
\end{aligned}
\tag{3}
$$

where $Firm\ Characteristics_{i,t-1}$ stands for the cost of capital, analyst coverage, litigation risk, and dividend payout. The regression results are reported in Table 4. The coefficients of *EPU* and *ICC* are positive and significant, indicating that stand-alone, both economic uncertainty and *ex-ante* cost of capital are associated with higher levels of CSR reporting, consistent with previous research (Dhaliwal et al. (2011)). However, the interaction term has a negative and significant coefficient, implying that the *ex-ante* cost of capital hinders the effect of EPU on CSR reporting. We observe positive and significant coefficients of other interaction terms. A firm, which has high analyst coverage, high litigation risk, and high dividend payout, tends to enhance the CSR reporting during the period of uncertainty.

[Insert Table 4 near here]

The above results suggest that the firms often choose to use CSR to alleviate the negative impact from uncertainty. Meanwhile, firms with different characteristics behave in different ways confronting high marcoeconomy uncertainty.

4.4. Impact of Firm Cultures

4.4.1. Firm Cultures from Earnings Calls

Under high economic uncertainty, managers may choose short-term projects over long-term ones to secure compensation or provide a signal to existing or outside investors (Stein (1989)), but effective governance mitigates short-termism (Gonzalez and André (2014)). We then focus on the impact of corporate cultures to answer the question: what type of firms are responding to the macroeconomic uncertainty using CSR as the alternative? Considering the following regression:

$$
\begin{aligned}
CSR_{i,t} = \alpha_i &+ \delta_1 EPU_{t-1} + \delta_2 Firm\ Cultures_{i,t-1} \\
&+ \delta_3 Firm\ Cultures_{i,t-1} \cdot EPU_{t-1} + \Upsilon_i Controls_{i,t-1} + \varepsilon_{i,t}
\end{aligned}
\tag{4}
$$

where $FirmCultures_{i,t-1}$ stands for the integrity, teamwork, innovation, respect, and quality from Li et al. (2021).

[Insert Table 5 near here]

The regression results are reported in Table 5. Column (1) illustrates that it is innovation and quality culture of firms that affect the participation of CSR activities. However, when we consider the macroeconomic uncertainty, innovation is not affecting firms' choices in CSR reporting. Firms with better integrity, teamwork, respect, and quality tend to response mildly to macroeconomic uncertainty using CSR disclosures. In another word, these firms have better ability to deal with uncertainty, and it is not essential for them to diminish information asymmetry using CSR.

4.4.2. CSR Reporting Aspects

Our attention turns to the content of CSR reportings. We have previously shown that firms choose to disclose their corporate social responsibility when market is experiencing high macroeconomic uncertainty. We are interested in what they discuss in their reports when they intend to use CSR reportings as a method to deal with high uncertainty. Huang, Wang, and Yang (2023) develop FinBERT which incorporates finance knowledge. It is effective in labelling ESG-related discussions into topics, including Business Ethics, Climate Change, Community Relations, Corporate Governance, Human Capital, Natural Capital, Pollution Waste, and Product Liability. The output gives a percentage in each category, indicating the portion of text that aligns with the corresponding topic. For example, a value of 0.45 in Climate Change implies that 45% of the report is on Climate Change.

We apply the FinBERT techniques on firms' Corporate Social Responsibility reports and investigate the topics firms emphasize when confronting macroeconomic uncertainty. Considering the following regression:

$$CSR\_Report\_Topic_{i,t} = \alpha_i + \delta_1 EPU_{t-1} + \Upsilon_i \text{Controls}_{i,t-1} + \varepsilon_{i,t} \tag{5}$$

where $CSR\_Report\_Topic_{i,t}$ stands for ESG-related topics.

[Insert Table 6 near here]

The results are illustrated in Table 6. Under the circumstances of high economic uncertainty, firms intend to discuss more about climate change in their CSR reports. However, the same condition prevents firms from talking about Social topics (community relations, human capital, and product liability). We also notice that big firms are more likely to discuss business ethics, human capital, natural capital, and product liability, while discussions on community relations and pollution waste are less focused.

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5. Conclusion

We assess the relationship between economic uncertainty and CSR reporting transparency across US firms over a window spanning from 2004 to 2021. Implementing Baker et al. (2016) EPU index as the proxy for economic uncertainty, our results suggest that increased EPU is associated with increased CSR reporting transparency. By examining the subsequent cumulative abnormal returns, we find CSR reporting acts as a buffer against the adverse effects caused by economic uncertainty. We also find firms' *ex-ante* cost of capital hinders the relationship between EPU and CSR. However, other firm characteristics such as analyst coverage, litigation risk, dividend payout are ecouraging firms' participation in CSR disclosures when EPU is high. Besides firm characteristics which mostly focus on financial elements, we consider the role of corporate cultures in our framework. Out results show that innovation and quality features are motivating firms to disclose CSR, and firms' culture in integrity, teamwork, respect, and quality enhance firms' capability confronting with high uncertainty. We further study the contents of CSR reports and find that firms intend to discuss more on Social topics (community relations, human capital, and product liability) when macroeconomic uncertainty is high.

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Figures
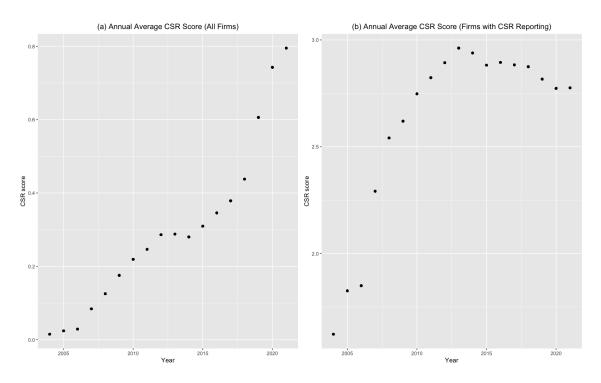

Fig. 1. Annual Average CSR Score.

Tables

Table 1: Summary Statistics

Panel A : Number of Firms and Number of CSR Reportings						
Year	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
# of firms	4829	4756	4657	4568	4198	3807
# of CSR Reporting	45	63	73	168	207	255
% of CSR Reporting	0.93%	1.32%	1.57%	3.68%	4.93%	6.70%
Year	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
# of firms	3925	3828	3689	3786	3955	3864
# of CSR Reporting	313	334	365	368	377	415
% of CSR Reporting	7.97%	8.73%	9.89%	9.72%	9.53%	10.74%
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
# of firms	3735	3784	3822	3751	3903	4483
# of CSR Reporting	446	497	582	807	1045	1284
% of CSR Reporting	11.94%	13.13%	15.23%	21.51%	26.77%	28.64%

Panel B: Summary Statistics of Variables					
CSR Scope	**Mean**	**Std**	**25%**	**50%**	**75%**
CSR	0.29	0.90	0	0	0
Report	0.10	0.30	0	0	0
OECD	0.01	0.07	0	0	0
Global	0.10	0.30	0	0	0
Assurance	0.03	0.16	0	0	0
Uncertainty indices					
EPU	1.24	0.42	0.93	1.20	1.48
VIX	18.79	6.30	14.23	16.64	22.55
Firm characteristics					
ROA	-0.05	0.26	-0.04	0.01	0.06
Cash	0.16	0.20	0.02	0.08	0.21
CFO	0.01	0.23	0.00	0.07	0.12
Leverage	2.42	5.15	0.39	1.05	2.70
MTB	2.06	1.76	1.06	1.44	2.31
Size	20.38	2.11	18.87	20.37	21.79
Legal	9.04	11.13	3.77	6.05	10.36
KZ	6.75	16.91	0.69	2.79	7.98
Dividend	0.01	0.03	0.00	0.00	0.01
ICC	0.06	0.11	-0.01	0.03	0.10
Moment	0.03	0.53	-0.20	0.02	0.25
Analyst	6.14	6.57	1.67	4.25	8.50

Table 2: The effect of economic policy uncertainty on firm CSR disclosures

	Dependent variable:					
	csr	report	oecd	scope	gri	assurance
	(1)	(2)	(3)	(4)	(5)	(6)
EPU	0.241***	0.083***	0.006***	0.085***	0.041***	0.026***
	(0.010)	(0.004)	(0.001)	(0.004)	(0.003)	(0.002)
VIX	−0.007***	−0.002***	−0.0001*	−0.002***	−0.001***	−0.001***
	(0.001)	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0001)
ROA	−0.048*	−0.015	0.002	−0.014	−0.015*	−0.006
	(0.027)	(0.010)	(0.004)	(0.010)	(0.009)	(0.007)
Cash	0.049*	0.017	−0.004	0.015	0.012	0.007
	(0.029)	(0.011)	(0.004)	(0.011)	(0.009)	(0.007)
CFO	−0.108***	−0.037***	−0.006	−0.032**	−0.022*	−0.012
	(0.036)	(0.013)	(0.005)	(0.013)	(0.011)	(0.009)
Leverage	0.006	0.004*	−0.0004	0.003	0.001	−0.002
	(0.007)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
MTB	0.020***	0.007***	0.001**	0.008***	0.001	0.002***
	(0.003)	(0.001)	(0.0004)	(0.001)	(0.001)	(0.001)
Size	0.137***	0.051***	0.003***	0.048***	0.023***	0.012***
	(0.006)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
Dividend	0.439**	0.043	0.018	0.056	0.134**	0.188***
	(0.176)	(0.064)	(0.023)	(0.065)	(0.057)	(0.043)
ICC	−0.088**	−0.023	−0.006	−0.030**	−0.003	−0.026***
	(0.040)	(0.014)	(0.005)	(0.015)	(0.013)	(0.010)
Moment	−0.024***	−0.009***	−0.001*	−0.008***	−0.001	−0.003**
	(0.007)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
Ret_Vol	0.293	0.083	0.029	0.138	−0.015	0.057
	(0.239)	(0.087)	(0.031)	(0.088)	(0.077)	(0.058)
Spread	2.652***	0.758***	0.075	0.888***	0.447***	0.484***
	(0.524)	(0.191)	(0.068)	(0.193)	(0.169)	(0.127)
Analyst	0.001	−0.001*	−0.00004	0.0003	0.002***	0.0003
	(0.001)	(0.0004)	(0.0001)	(0.0004)	(0.0004)	(0.0003)
Legal	0.003***	0.001***	0.0001	0.001***	0.0005***	0.0004***
	(0.0004)	(0.0002)	(0.0001)	(0.0002)	(0.0001)	(0.0001)
KZ	−0.002	−0.001*	0.0001	−0.001	−0.0003	0.001
	(0.002)	(0.001)	(0.0003)	(0.001)	(0.001)	(0.001)
CSR_lag	1.767***	0.620***	0.039***	0.593***	0.362***	0.153***
	(0.012)	(0.004)	(0.002)	(0.004)	(0.004)	(0.003)
Observations	45,743	45,743	45,743	45,743	45,743	45,743
R^2	0.759	0.721	0.451	0.702	0.648	0.539
FE	YES	YES	YES	YES	YES	YES

Note: *p<0.1; **p<0.05; ***p<0.01

Table 3: Cumulative Abnormal Return Under Macroeconomic Uncertainty

	Dependent variable:		
	Cumulative Abnormal Return		
	(1)	(2)	(3)
CSR	0.017***		
	(0.003)		
EPU	−0.013	−0.017**	
	(0.009)	(0.007)	
VIX	−0.0003		−0.001**
	(0.0005)		(0.0004)
EPU ×CSR		0.010***	
		(0.003)	
VIX×CSR			0.0005***
			(0.0002)
ROA	−0.265***	−0.266***	−0.268***
	(0.021)	(0.021)	(0.021)
Cash	−0.027	−0.027	−0.027
	(0.022)	(0.022)	(0.022)
CFO	0.060**	0.058**	0.062**
	(0.027)	(0.027)	(0.027)
Leverage	0.014**	0.014**	0.014**
	(0.006)	(0.006)	(0.006)
MTB	−0.063***	−0.062***	−0.063***
	(0.003)	(0.003)	(0.003)
Size	−0.035***	−0.033***	−0.034***
	(0.005)	(0.005)	(0.005)
Dividend	−0.235	−0.225	−0.226
	(0.145)	(0.145)	(0.145)
ICC	0.659***	0.661***	0.653***
	(0.030)	(0.030)	(0.030)
Moment	−0.207***	−0.207***	−0.207***
	(0.005)	(0.005)	(0.005)
Ret_Vol	1.557***	1.497***	1.597***
	(0.205)	(0.188)	(0.204)
Spread	12.267***	12.285***	12.326***
	(0.390)	(0.390)	(0.390)
Analyst	−0.006***	−0.006***	−0.006***
	(0.001)	(0.001)	(0.001)
Legal	−0.007***	−0.007***	−0.007***
	(0.0005)	(0.0005)	(0.0005)
KZ	−0.004**	−0.004**	−0.004**
	(0.002)	(0.002)	(0.002)
Observations	40,540	40,540	40,540
R^2	0.373	0.373	0.372
FE	YES	YES	YES

Note: *p<0.1; **p<0.05; ***p<0.01

Table 4: Firm Characteristics and CSR Reportings Under Macroeconomic Uncertainty

	Dependent variable:			
	CSR			
	ICC	Analyst	Legal	Dividend
EPU	0.550***	0.231***	0.440***	0.480***
	(0.013)	(0.015)	(0.014)	(0.013)
ICC	0.933***	−0.162***	−0.183***	−0.171***
	(0.107)	(0.048)	(0.049)	(0.049)
Analyst	0.007***	−0.042***	0.008***	0.008***
	(0.001)	(0.002)	(0.001)	(0.001)
Legal	0.005***	0.005***	−0.004***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Dividend	1.000***	1.025***	1.104***	−0.905**
	(0.218)	(0.215)	(0.218)	(0.415)
EPU×ICC	−0.864***			
	(0.074)			
EPU×Analyst		0.036***		
		(0.001)		
EPU×Legal			0.006***	
			(0.001)	
EPU×Dividend				1.517***
				(0.273)
VIX	−0.017***	−0.016***	−0.016***	−0.016***
	(0.001)	(0.001)	(0.001)	(0.001)
ROA	−0.102***	−0.089***	−0.096***	−0.102***
	(0.034)	(0.033)	(0.034)	(0.034)
Cash	0.118***	0.128***	0.125***	0.128***
	(0.036)	(0.035)	(0.036)	(0.036)
CFO	−0.209***	−0.194***	−0.214***	−0.224***
	(0.044)	(0.044)	(0.044)	(0.044)
Leverage	−0.001	0.001	−0.002	−0.002
	(0.008)	(0.008)	(0.008)	(0.008)
MTB	0.033***	0.034***	0.033***	0.034***
	(0.004)	(0.004)	(0.004)	(0.004)
Size	0.262***	0.279***	0.272***	0.271***
	(0.008)	(0.008)	(0.008)	(0.008)
Moment	−0.047***	−0.044***	−0.050***	−0.047***
	(0.008)	(0.008)	(0.008)	(0.008)
Ret_Vol	0.997***	0.509*	0.705**	0.663**
	(0.297)	(0.292)	(0.296)	(0.296)
Spread	5.717***	6.829***	5.730***	5.610***
	(0.649)	(0.643)	(0.650)	(0.650)
KZ	0.001	0.0003	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.003)
Observations	45,743	45,743	45,743	45,743
R^2	0.631	0.638	0.630	0.630
FE	YES	YES	YES	YES

Note: *p<0.1; **p<0.05; ***p<0.01

Table 5: Firm Cultures and CSR Reportings Under Macroeconomic Uncertainty

	Dependent variable:					
	CSR					
	(1)	(2)	(3)	(4)	(5)	(6)
Integrity	−0.003	0.029**	0.001	0.0005	0.001	0.001
	(0.005)	(0.012)	(0.005)	(0.005)	(0.005)	(0.005)
Teamwork	0.002	0.005	0.092***	0.004	0.005	0.004
	(0.005)	(0.004)	(0.009)	(0.004)	(0.004)	(0.004)
Innovation	0.055***	0.047***	0.047***	0.053***	0.047***	0.047***
	(0.003)	(0.003)	(0.003)	(0.005)	(0.003)	(0.003)
Respect	0.004	0.0003	0.001	0.0002	0.065***	0.0002
	(0.004)	(0.004)	(0.004)	(0.004)	(0.007)	(0.004)
Quality	0.020***	0.014***	0.014***	0.014***	0.014***	0.029***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.010)
Integrity×EPU		−0.023***				
		(0.009)				
Teamwork×EPU			−0.071***			
			(0.006)			
Innovation×EPU				−0.005		
				(0.004)		
Respect×EPU					−0.051***	
					(0.004)	
Quality×EPU						−0.011*
						(0.007)
EPU		0.592***	0.715***	0.561***	0.703***	0.569***
		(0.026)	(0.022)	(0.024)	(0.021)	(0.023)
VIX		−0.014***	−0.014***	−0.014***	−0.014***	−0.014***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
ROA	−0.042	−0.086*	−0.077*	−0.087*	−0.087*	−0.088*
	(0.047)	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)
Cash	0.323***	0.156***	0.155***	0.155***	0.158***	0.155***
	(0.049)	(0.049)	(0.048)	(0.049)	(0.048)	(0.049)
CFO	−0.353***	−0.247***	−0.250***	−0.248***	−0.231***	−0.246***
	(0.063)	(0.062)	(0.061)	(0.062)	(0.061)	(0.062)
Leverage	0.005	0.018	0.017	0.017	0.019	0.018
	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
MTB	0.052***	0.037***	0.038***	0.037***	0.037***	0.037***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Size	0.439***	0.321***	0.324***	0.321***	0.326***	0.321***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Dividend	1.560***	0.911***	0.915***	0.919***	0.915***	0.925***
	(0.313)	(0.306)	(0.306)	(0.306)	(0.306)	(0.306)
ICC	0.033	−0.262***	−0.272***	−0.264***	−0.279***	−0.263***
	(0.076)	(0.075)	(0.075)	(0.075)	(0.075)	(0.075)
Moment	−0.043***	−0.058***	−0.057***	−0.058***	−0.058***	−0.058***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Ret_Vol	3.332***	0.838*	0.632	0.842*	0.835*	0.837*
	(0.402)	(0.458)	(0.457)	(0.458)	(0.457)	(0.458)
Spread	8.463***	9.627***	9.987***	9.519***	9.887***	9.536***
	(1.263)	(1.237)	(1.234)	(1.236)	(1.234)	(1.236)
Analyst	0.009***	0.005***	0.005***	0.005***	0.005***	0.005***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Legal	0.002***	0.004***	0.004***	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
KZ	−0.001	−0.005	−0.005	−0.005	−0.005	−0.005
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Observations	34,586	34,586	34,586	34,586	34,586	34,586
R^2	0.627	0.644	0.645	0.644	0.645	0.644
FE	YES	YES	YES	YES	YES	YES

Note: *p<0.1; **p<0.05; ***p<0.01

Table 6: CSR Reportings Topics Under Macroeconomic Uncertainty

	business ethics	climate change	community relations	corporate governance	human capital	natural capital	pollution waste	product liability
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
epu	0.002	0.023***	−0.021**	0.005	−0.013**	0.0005	−0.003	−0.005**
	(0.002)	(0.007)	(0.009)	(0.005)	(0.006)	(0.003)	(0.004)	(0.002)
roa	−0.001	0.031	0.042	−0.044*	−0.005	−0.005	0.008	−0.006
	(0.013)	(0.037)	(0.047)	(0.026)	(0.033)	(0.018)	(0.020)	(0.012)
cash	0.015	0.011	−0.120*	−0.004	0.003	−0.001	0.003	0.039**
	(0.017)	(0.049)	(0.063)	(0.035)	(0.044)	(0.023)	(0.026)	(0.016)
cfo	0.012	−0.046	0.110	−0.088**	0.029	0.011	0.015	0.014
	(0.019)	(0.056)	(0.072)	(0.040)	(0.051)	(0.027)	(0.030)	(0.018)
lev	0.004	−0.005	0.014	0.013*	−0.005	−0.008*	−0.010*	−0.004
	(0.003)	(0.010)	(0.013)	(0.007)	(0.009)	(0.005)	(0.005)	(0.003)
mtb	0.003	−0.004	−0.028***	0.001	0.014**	−0.001	0.007**	0.001
	(0.002)	(0.006)	(0.008)	(0.004)	(0.005)	(0.003)	(0.003)	(0.002)
size	0.008***	0.001	−0.027***	0.001	0.013*	0.010***	−0.018***	0.008***
	(0.003)	(0.008)	(0.010)	(0.005)	(0.007)	(0.004)	(0.004)	(0.002)
dvd	−0.034	0.182	−0.517**	0.241*	0.224	0.114	−0.064	0.010
	(0.071)	(0.202)	(0.261)	(0.144)	(0.184)	(0.097)	(0.109)	(0.067)
icc	−0.008	−0.043	0.002	0.071	0.001	0.001	−0.029	0.032
	(0.023)	(0.067)	(0.086)	(0.047)	(0.060)	(0.032)	(0.036)	(0.022)
moment	−0.005*	0.009	0.007	0.008	−0.012*	0.001	−0.004	0.00004
	(0.003)	(0.008)	(0.010)	(0.006)	(0.007)	(0.004)	(0.004)	(0.003)
ret_sd	−0.035	0.515	−0.248	−0.374	0.328	0.024	−0.255	0.094
	(0.131)	(0.375)	(0.482)	(0.266)	(0.340)	(0.179)	(0.203)	(0.123)
spread	−1.882	7.472	6.506	−2.172	−24.481***	−1.920	12.690***	−0.010
	(2.079)	(5.956)	(7.670)	(4.232)	(5.406)	(2.848)	(3.221)	(1.964)
analyst	0.0002	−0.00002	−0.002**	0.001*	−0.0003	0.001*	0.001*	−0.0001
	(0.0002)	(0.001)	(0.001)	(0.0005)	(0.001)	(0.0003)	(0.0004)	(0.0002)
legal	−0.0001	0.001**	−0.00004	−0.0004	−0.001	−0.0001	0.0001	0.0001
	(0.0002)	(0.0005)	(0.001)	(0.0003)	(0.0004)	(0.0002)	(0.0003)	(0.0002)
kz	−0.001	0.002	−0.004	−0.004*	0.002	0.002	0.003*	0.001
	(0.001)	(0.003)	(0.004)	(0.002)	(0.003)	(0.001)	(0.002)	(0.001)
Observations	2,539	2,539	2,539	2,539	2,539	2,539	2,539	2,539
R^2	0.577	0.665	0.591	0.506	0.621	0.637	0.617	0.584
Adjusted R^2	0.486	0.593	0.503	0.401	0.540	0.560	0.535	0.495
FE	YES	YES	YES	YES	YES	YES	YES	YES

Note: *p<0.1; **p<0.05; ***p<0.01

Appendix

Table A1: Variables definitions

Variable	Definition	Source
Uncertainty		
EPU	Yearly average of the daily index based on the number of news articles that contain the EPU terms	Baker et al. (2016)
VIX	Yearly average of the daily closing CBOE S&P500 Volatility Index	CBOE Indexes
CSR Reporting		
CSR	CSR reporting transparency score, summing the indicator variable of Report, OECD, Global, GRI, and Assurance	ASSET4
Report	Indicates (1/0) whether a CSR report is published	ASSET4
OECD	Indicates (1/0) whether the report is compliant with OECD reporting guidelines	ASSET4
Global	Indicates (1/0) whether the report covers a global scope	ASSET4
GRI	Indicates (1/0) whether the report is compliant with GRI reporting	ASSET4
Assurance	Indicates (1/0) whether the report is audited	ASSET4
Firm Characteristics		
ROA	Income before extraordinary items scaled by total assets	COMPUSTAT
Cash	Cash balance scaled by total assets	COMPUSTAT
CFO	Firm Characteristics	COMPUSTAT
Leverage	Total book liability divided by total book equity	COMPUSTAT
MTB	Book value of liability plus the market value of equity, scaled by total assets	COMPUSTAT
Size	The natural logarithm of total assets	COMPUSTAT
Dividend	Dividend payout scaled by total assets	COMPUSTAT
ICC	The average implied cost of capital from the four most commonly used accounting-based methodologies	COMPUSTAT
Moment	Cumulative market-adjusted returns	COMPUSTAT
Ret Vol	The standard deviation of the daily returns	COMPUSTAT
Spread	Average daily bid-ask spread	COMPUSTAT
Analyst	Total number of analysts following	I/B/E/S
Legal	Ex-ante corporate litigation risk	COMPUSTAT
KZ	KZ index that measures reliance on external financing	COMPUSTAT