

Economic Policy Uncertainty and Corporate Social Responsibility: Evidence from China

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Abstract: In this paper, we analyze the impact of economic policy uncertainties on corporate social responsibility. Moreover, the method that we use is multiple linear regression. To quantify economic policy uncertainty and corporate social responsibility, we use the Baker economic policy uncertainty index (*EPU*) and the corporate social responsibility rating (*CSR*) as a proxy. After adding year and industry fixed effects, we get a significantly negative relationship between *CSR* and *EPU*. After adding more control variables, the result remains negative and significant. Then we do a series of robustness checks by adding lagged variables and multi-fixed effects. All of those results remain significant. Then we conduct heterogeneity analysis. We find that the state-owned-enterprises have a more negative correlation between *EPU* and *CSR*. In addition, those big four audit firms also have a higher negative correlation between *EPU* and *CSR*. Overall, we have sufficient evidence to show a negative correlation between economic policy uncertainties and corporate social responsibility. Therefore, if we want firms to bear more social responsibilities, one of the good approaches is to reduce the uncertainties on economic policies. For example, governments can implement more moderate and predictable fiscal and monetary policies.

1. Introduction

"Corporate social responsibility (CSR)" is a set of international private business self-regulation standards. Its purpose is to contribute to societal goals of a philanthropic, activist, or charitable nature by conducting or supporting volunteering or ethically oriented practices. Starbucks is one of the leading firms for outstanding social responsibility. Starbucks' goals for 2020 and beyond include hiring 10,000 refugees, reducing the environmental impact of its cups, and engaging its employee in environmental leadership [1]. A good record of a firm's CSR will benefit the general public and benefit the firm itself. Firstly, it will benefit this firm's reputation, which may increase the firm's profit. In addition, it can also reduce the legal risk for a certain firm because, in some countries, the government would mandatorily ask firms to bear some kind of social responsibility by law. Moreover, CSR activities can help forge a stronger bond between employees and corporations, boost morale and help both employees and employers feel more connected with the world around them [1]. This might increase the overall productivities of the firm.

To measure Economic Policy Uncertainty (EPU), we turn our attention to China and find evidence from China. To better understand the importance of EPU and how EPU affects CSR, we can put our sight to the past. Since 1949, China has suffered a fluctuated EPU and reached several peak points due to the founding of new China, the Vietnam War, and Campaign on the Working Class Holding Political Power, and another important historical period. In the globalization era, from 2000 to 2019, EPU tended to be stable until 2008. As the outbreak of the financial crisis, the world's EPU increased rapidly [2]. After this, to promote economic recovery, countries around the world launched stimulus policies. Especially for China's economy, it is in the three-stage superposition stage of the shift of growth rate,

the painful period of structural adjustment and the digestion period of early stimulus policies. To prevent economic downturn, "The Belt and Road Initiative", "4 trillion stimulus package", and other measures to deal with the crisis were full of uncertainty during that time. Therefore, any major economic policy will lead to the rise of EPU.

This paper concludes that EPU has a negative impact on CSR. Therefore, the government reducing the uncertainties on economic policies is a good approach to make firms have a better social responsibility record. The possible reason for this relationship is that if the economic policies are very uncertain, firms will retain more of their earnings to be prepared for the impact of unpredictable economic policies. Otherwise, those earnings may be used to improve the welfare of employees or pay dividends to shareholders. It is also possible that when the economic policy uncertainty is high, the company manager will spend most of their time considering how to deal with different kinds of policies. Therefore, they would have less time to consider how to pay back our society.

Unlike all previous articles that do research of corporate social responsibility (CSR) from the risk of a stock market crash, corporate culture, or other factors. In this paper, for the first time, we explore its influence factors from the perspective of economic policy uncertainty (EPU) and find that EPU is a powerful factor affecting corporate social responsibility. Furthermore, our findings analyze the economic consequences of EPU in the view of CSR. With regard to the relationship between ownership type and EPU on CSR, it shows a negative correlation which means more negative EPU on CSR. It will be more potentially boost the development of state-owned-enterprises (SOEs). From the result of audit quality, if the firm is audited by the big four, it indicates a highly negative influence of EPU on CSR. Therefore, EPU will affect the operation and auditing quality of the enterprise and have an impact on the participation of corporate social responsibility based on the interests of stakeholders. In addition, the government and enterprise departments should pay attention to the influence of external uncertainty

2. Data and methodology

2.1 Data and variable definition

This paper will select all the listed companies in Shanghai Stock Exchange and Shenzhen Stock Exchange from 2012 to 2018 as research samples. Our accounting data are extracted from the wind database, and China's economic policy uncertainty index is from Baker et al. (2013). The dataset has 32 variables and 12,332 observations. The time range of this dataset is from 2012 to 2018. The major variables used in this analysis are Size, BM, ROA, LEV, Tobin, board, SOE, big4, and lagged variable of CSR. Size is the logarithm of the market value of the firm. BM is the book-to-market ratio. ROA is the return on assets. LEV indicates the leverage ratio. It measures how much financial leverage the firm has taken on. [8] Tobin indicates Tobin's Q for a firm. It is the ratio between a firm's market price and its assets' replacement value. [7] The variable board indicates the logarithm of the size of the board of directors. The variable SOC is a binary variable to indicate whether a firm is a state-owned cooperation. The variable big4 is also a dummy variable that indicates if big four accounting firms audit this company. To enrich and prove our research and analysis, we carry out 7 tables in empirical results, which are descriptive statistics of variables, correlation coefficients, the impact of EPU on CSR, robustness checks of adding CSR lagged variables and multi-fixed effects model analysis, two heterogeneity analysis. In addition, one of our findings points out that the impact of EPU on CSR can be affected by ownership type and audit quality. All our control variables data are retrieved from China Stock Market & Accounting Research DATABASE (CSMAR). Excluding all financial companies to minimize the sample selection errors caused by possible samples. Moreover, observed values of 1% and 99% quantiles are substituted for values that lie outside 1% and 99% quantiles, as outliers may affect our regression results.

2.2 Measurement of major variables

2.2.1. CSR

Cooperates social responsibility (CSR) is not a quantitative object by nature. However, to conduct multiple linear regressions, we must express the data for every variable quantitatively in the dataset. Therefore, we chose to use the score of social responsibility rating as a proxy to quantitatively measure CSR. This rating is on a 0 to 100 scale. A higher score indicates better social responsibility and better CSR performance of firms. In our dataset, we divide this score by 100. This transformation converts it to a 0 to 1 scale.

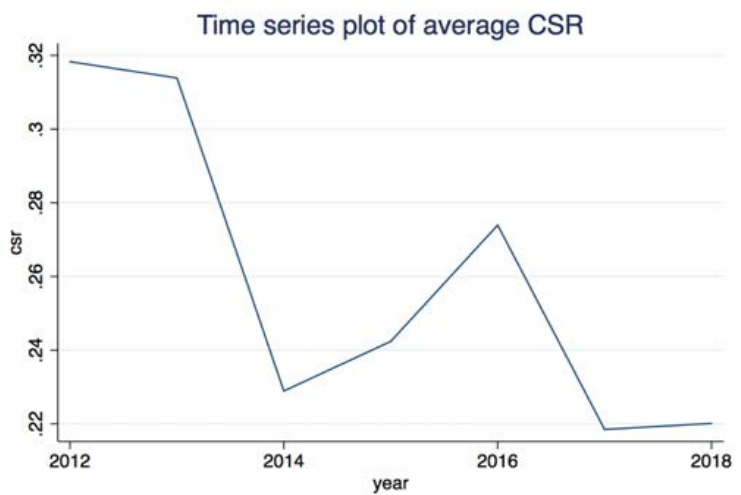


Figure 1. The average CSR index from 2012 to 2018.

Figure 1 illustrates the time series plot for the CSR index from 2012 to 2018. Again, there is a decrease in the CSR index over this period. That is, firms bear fewer social responsibilities compared with the past.

2.2.2. EPU

Similar to CSR, economic policy uncertainty is not a quantitative variable as well. In this case, we use Baker economic policy uncertainty index for China to quantitatively measure it. This index was developed by Scott Baker, Nick Bloom, Steven J. Davis and, Xiaoxi (Sophie) Wang. The calculation of this index is on the proportion of government policy related new on South China Morning Posting, which is the leading English newspaper in Hong Kong. A larger index value is associated with a higher degree of economic policy uncertainty in China for a specific year.

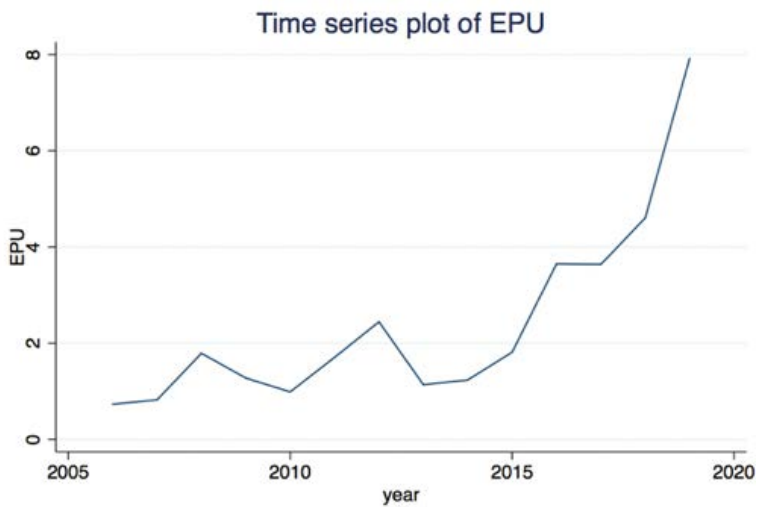


Figure 2. The average economic policy uncertainty index (EPU) from 2006 to 2018.

According to Figure 2, there is an increasing trend of economic policy uncertainty index over time. The increasing trend accelerated after 2012. Combined with Figure 1, we can see that CSR decreases as EPU increases. There is an inverse correlation between those two variables across the dimension of time.

2.3 Regression Model

To examine the attention effect on CSR, we propose a panel regression model on a yearly basis as follows.

$$CSR_{i,t} = \alpha + \beta * EPU_{i,t} + \sum_k \lambda_k * controls_{k,i,t} + \varepsilon_{i,t} \quad (1)$$

We fit a simple linear regression model with predictor EPU and outcome variable CSR. Although the simple linear regression method is straightforward, it has a well-known defect, the omitted variable bias. This problem could cause our estimate to have a large bias compared with the true causal effect. To alleviate omitted variable bias and reduce endogeneity, we add some control variables to the model. Those controls are Size, BM, ROA, LEV, Tobin, and Board. The dataset is panel data. Every data for those variables indicates the value for a specific firm *i* at time *t*. By adding those controls, we can eliminate a large proportion of omitted variable bias to approximate the causal effect. In addition, we also add time and industry fixed effects in our model by adding dummy variables for different years and industries. It can let us control time and industry to further eliminate omitted variable bias. Moreover, it can also let us explore the impact of EPU on CSR for a specific year or a specific industry.

3. Empirical results

We conduct most of our empirical analysis by the method of multiple linear regression. The following seven tables illustrate our results. In our regression, we tried different combinations of control variables. The purpose of this robustness check is to reduce the endogeneity issue. Overall, the results remain significant by following tables.

Table I. Descriptive statistics.

VARIABLES	N	MEAN	STD. DEV.	MIN	MEDIAN	MAX
CSR _{I,T}	12,332	0.253	0.143	0.000	0.227	0.748
EPU _{I,T}	12,332	2.894	1.264	1.139	3.639	4.605
SIZE _{I,T}	12,332	22.590	1.114	20.580	22.440	26.190
BM _{I,T}	12,332	0.591	0.228	0.138	0.586	1.092
ROA _{I,T}	12,332	0.049	0.044	-0.164	0.045	0.190
LEV _{I,T}	12,332	0.375	0.193	0.044	0.358	0.840
TOBINQ _{I,T}	12,332	2.072	1.150	0.916	1.706	7.236
BOARD _{I,T}	12,332	2.123	0.197	1.609	2.197	2.708

Table I illustrates the descriptive statistics of variables that we used in our analysis. The mean of variables, the comprehensive score of social responsibility (CSR) and EPU, are 0.253 and 2.894, respectively. The standard deviation of CSR is 0.143, and that of EPU is 1.264. Meanwhile, the average logarithm of the market value of the firm (Size) of our sample is 22.590, the mean of book-to-market ratio (BM) is 0.591, the mean of leverage (Lev) is 0.375, and the mean of return on assets (ROA) of 0.049. The ranges of CSR and EPU are 0.748 and 3.466, respectively, which indicates that the economic policy uncertainty has a higher range than corporate social responsibility.

Table II. Pearson correlation coefficients

	1.	2.	3.	4.	5.	6.	7.	8.
1. CSR _{I,T}	1							
2. EPU _{I,T}	-0.121***	1						
3. SIZE _{I,T}	0.237***	0.014	1					
4. BM _{I,T}	0.054***	0.158***	0.170***	1				
5. ROA _{I,T}	0.337***	0.052***	-0.023**	-0.275***	1			
6. LEV _{I,T}	0.007	-0.002	0.500***	0.394***	-0.392***	1		
7. TOBINQ _{I,T}	-0.028***	-0.149***	-0.009	-0.853***	0.220***	-0.310***	1	
8. BOARD _{I,T}	0.128***	-0.077***	0.241***	0.177***	-0.028***	0.171***	-0.146***	1

Table II reports the Pearson correlation coefficients among selected variables. As is shown in Table 2, the correlation coefficient between EPU and CSR is -0.121, which is significantly negative at the 1% level. This result preliminarily verifies that there exists a significantly negative relationship between policy uncertainty and corporate social responsibility. In addition, there is no perfect correlation between different variables, which allows us to conduct a multiple linear regression by using the above variables. However, there is a highly negative correlation between TobinQ and BM. To address this concern, we conduct OLS estimation to ensure that there is no perfect multicollinearity between predictors, indicating that our empirical results are not affected by multicollinearity.

Table III. The impact of EPU on CSR

DEPENDENT VARIABLE=	CSR _{I,T}	
	(1)	(2)
EPU _{I,T}	-0.046*** (-19.94)	-0.052*** (-22.03)
SIZE _{I,T}		0.032*** (18.36)
BM _{I,T}		0.015 (1.30)
ROA _{I,T}		1.132*** (34.25)
LEV _{I,T}		-0.019* (-1.95)
TOBINQ _{I,T}		-0.008*** (-4.38)
BOARD _{I,T}		0.017** (2.33)
CONSTANT	0.396*** (17.09)	-0.363*** (-8.96)
YEAR FIXED EFFECTS	YES	YES
INDUSTRY FIXED EFFECTS	YES	YES
OBSERVATIONS	12,332	12,332
ADJUSTED R ²	0.136	0.217

Table III shows our regression outputs. In Column (1), we conduct a simple linear regression. We find that there exists a significantly negative relationship between CSR and EPU. The coefficient is -0.046. That is, when EPU increases by one standard deviation, we expect that CSR falls by 0.407 (0.046*1.264/0.143) standard deviation on average. This coefficient is highly statistically significant at 1% significant level. The Adjusted R-square is pretty small, which is 0.136. That means the variation in EPU only accounts for a small proportion of the variation in CSR, indicating that there are still a lot of other variables that count explains the variable in CSR. However, EPU may affect CSR through other variables. If we want to study the effect of EPU only, we should add more variables to control them. Therefore, we conduct a multiple linear regression in Column (2). After controlling for the variables Size, BM, ROA, LEV, TobinQ, and Board, we get a similar result as Column (1). The coefficient for EPU that we get now is -0.052, close to the -0.046 that we obtained in Column (1). When EPU increases by one standard deviation, we expect CSR to fall by 0.460 (0.052*1.264/0.143) standard deviation on average. It is still highly statistically significant with a t-value of -22.03. Overall, both results indicate that there exists a significantly negative impact of economic policy uncertainty on corporate social responsibility.

Table IV. Robustness checks: adding CSR lagged variables.

Dependent variable=	CSR _{i,t}		
	(1)	(2)	(3)
EPU _{i,t}	-0.030*** (-17.04)	-0.046*** (-20.40)	-0.032*** (-17.70)
CSR _{i,t-1}	0.455*** (45.26)		0.370*** (32.71)
CSR _{i,t-2}		0.345*** (32.03)	0.149*** (13.12)
Size _{i,t}	0.011*** (8.84)	0.013*** (8.82)	0.006*** (5.45)
BM _{i,t}	0.026*** (2.95)	0.027** (2.52)	0.028*** (3.37)
ROA _{i,t}	0.903*** (35.86)	1.082*** (37.52)	0.906*** (37.40)
LEV _{i,t}	0.017*** (2.73)	0.015** (1.99)	0.026*** (4.49)
TobinQ _{i,t}	-0.004*** (-2.60)	-0.004* (-1.88)	-0.003* (-1.76)
Board _{i,t}	0.011** (2.34)	0.015*** (2.77)	0.010** (2.45)
Constant	-0.067** (-2.52)	-0.067** (-2.05)	0.016 (0.66)
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
Observations	12332	12332	12332
Adjusted R ²	0.172	0.109	0.159

Table IV represents the results of the robustness check. To address potential concerns that our empirical results are driven by endogeneity, we conduct the following robustness checks. Firstly, we add the lagged variables of CSR into our regression model to exclude the impact of a given firms' prior CSR performance on the current CSR performance. After adding lagged variables, the coefficients of EPU remain significant. Specifically, the coefficient is -0.030 when we add one lagged variable CSR_{i,t}, -0.046 when we add CSR_{i,t-2}, and -0.032 when we add both CSR_{i,t-1} and CSR_{i,t-2}. All of those coefficients for EPU are statistically significant at 1% significant level. Moreover, the values of their coefficients did not have large changes compare with those in Table 3. The above results show that our empirical results are robust

Table V. Robustness checks: multi-fixed effects model analysis

Dependent variable=	CSR _{i,t}		
	(1)	(2)	(3)
EPU _{i,t}	-0.065*** (-20.34)	-0.047*** (-2.97)	-0.085*** (-10.97)
Size _{i,t}	0.050*** (11.36)	0.046*** (10.34)	0.049*** (11.71)
BM _{i,t}	0.023* (1.74)	0.028** (2.09)	0.026** (1.98)
ROA _{i,t}	0.955*** (22.44)	0.965*** (22.26)	0.949*** (22.47)
LEV _{i,t}	-0.017 (-1.15)	-0.017 (-1.15)	-0.013 (-0.93)
TobinQ _{i,t}	-0.009***	-0.009***	-0.009***

	(-4.65)	(-4.67)	(-4.58)
Board _{i,t}	0.007	0.004	0.011
	(0.56)	(0.29)	(0.83)
Constant	-0.680***	-0.656***	-0.574***
	(-7.41)	(-5.48)	(-6.42)
Firm	Yes	Yes	Yes
Year	Yes	No	No
Industry*Year	No	Yes	No
Province*Year	No	No	Yes
Observations	12332	12332	12332
Adjusted R ²	0.222	0.246	0.254

To exclude the impact of unobservable factors of different specific firms on our empirical results, we control for the firm fixed effects [4]. In addition, extant studies point out that the dependent variable CSR performance of a given firm is affected by its peer firms [3]. Thus, we control for the industry*year fixed effects and province*year fixed effects in this section. As is shown in Table 5, the coefficients for EPU are -0.065, -0.047, and -0.085 in Columns (1) to (3), respectively. All of the above three coefficients are statistically significant at 1% level. The coefficients of EPU in Columns (1) and (2) do not have large changes compared with those in Table 2. The above results indicate that our empirical results are not driven by firm, industry, or province factors.

Table VI. Heterogeneity analysis: ownership type.

Dependent variable=	CSR _{i,t}	
	(1)	(2)
EPU _{i,t} *SOE _{i,t}	-0.016*** (-6.80)	-0.018*** (-8.51)
EPU _{i,t}	-0.042*** (-18.68)	-0.047*** (-20.20)
SOE _{i,t}	0.075*** (6.66)	0.075*** (7.35)
Size _{i,t}		0.030*** (16.42)
BM _{i,t}		0.019* (1.67)
ROA _{i,t}		1.154*** (35.12)
LEV _{i,t}		-0.027*** (-2.67)
TobinQ _{i,t}		-0.008*** (-4.00)
Board _{i,t}		0.011 (1.55)
Constant	0.372*** (15.45)	-0.329*** (-7.74)
Year	Yes	Yes
Industry	Yes	Yes
Observations	12332	12332
Adjusted R ²	0.140	0.222

Table VI reports the heterogeneity analysis of ownership type. SOE is a binary variable that indicates whether a firm is a state-own-enterprises. It takes one when the firm in a particular observation is state-own-enterprises and zeroes otherwise. We find that the coefficients of EPU*SOE are significantly negative, which indicates that the negative impact of EPU on CSR will be enhanced in state-owned enterprises (hereafter, SOEs). In Column (1), the coefficient is -0.016. In Column (2),

the coefficient becomes more negative, accounting for -0.018. The above regression results show that the impact of EPU on CSR performance is more prominent in SOEs than non-SOEs. Considering the potential explanations, we conjecture that SOEs tend to have higher information opacity. Therefore, when facing the same EPU level, SOEs tend to reduce their CSR investment to maintain the firm performance.

Table VII. Heterogeneity analysis: audit quality.

Dependent variable=	CSR _{i,t}	
	(1)	(2)
EPU _{i,t} *Big4 _{i,t}	-0.042*** (-8.78)	-0.040*** (-8.50)
EPU _{i,t}	-0.044*** (-19.33)	-0.049*** (-20.98)
Big4 _{i,t}	0.220*** (10.64)	0.163*** (8.19)
Size _{i,t}		0.029*** (15.52)
BM _{i,t}		0.012 (1.03)
ROA _{i,t}		1.125*** (33.88)
LEV _{i,t}		-0.017* (-1.69)
TobinQ _{i,t}		-0.007*** (-3.89)
Board _{i,t}		0.017** (2.38)
Constant	0.388*** (16.72)	-0.295*** (-7.01)
Year	Yes	Yes
Industry	Yes	Yes
Observations	12332	12332
Adjusted R ²	0.145	0.224

Table VII reports the heterogeneity analysis under different external auditing qualities. We find that the coefficients of EPU*Big4 are significantly negative, which indicates that the negative impact of EPU on CSR is stronger in firms audited by the big 4 auditors. The potential explanation is that when facing higher EPU, those firms audited by the big 4 tend to reduce their CSR performance to maintain the stability of their cash flow, thus getting a satisfied auditing rating.

4. Conclusion

EPU has a significant negative impact on CSR for the case without control variables at 1% significance level. After we add more control variables, the result remains significant. The result for multiple linear regression with controls is that when EPU increases one standard deviation, we expect the CSR to fall by 0.46 standard deviation on average. Moreover, for robustness check, we also add the lagged variable for CSR to eliminate the time trend effect, and we also try multiple combinations of fixed effects. The result remains negative and significant. Furthermore, we also analyze the possible heterogeneity on the size of the effect depending on different ownership types and audit quality. We find that the negative correlation between EPU and CSR are significantly smaller for state-owned firms and those firms which Big four accounting firms audit. In conclusion, there is sufficient evidence that the government implementing stable and predictive economic policies is feasible to promote firms to bear more social responsibilities.

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