Corporate Social Responsibility and Firm Survival: Evidence from Chinese Listed Firms

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Abstract

This study examines the effect of Corporate Social Responsibility (CSR) on Chinese firms' probability of survival using 2,426 firm-year observations over the period 2011-2019. We find evidence that CSR has a positive effect on firms' survival prospects. This effect is stronger for State-Owned Enterprises (SOEs). The result is robust to an instrumental variable approach and several quasi-natural experiments. We further decompose CSR into its components, and we identify a more prominent positive effect of the CSR environmental component for SOEs. SOEs generally appear to have an easier path to survival when engaged in CSR activities. The results remain valid when accounting for a set of robustness checks related to alternative CSR measures, financial constraints, provincial diversity, exogenous shocks and placebo tests. Taken altogether, this study provides evidence that CSR activities improve firms' probability of survival in a government intervention setting.

Keywords: Corporate Social Responsibility; Firm Survival; State Ownership
JEL: G30, G33, L21, L25, M14

1. Introduction

Corporate Social Responsibility (CSR) has transformed into an important indicator of successful business decision-making, capital growth and firm longevity (Lins *et al.,* 2017; Albuquerque *et al.*, 2019; Chen *et al.*, 2020). This is particularly observable globally after 2000 and supported not only by academic research but also by reports from OECD (Baskin and Gordon, 2005), European Commission (EC, 2011) and SIF foundation (SIF, 2018).

Previous empirical studies have focused on the relationship between CSR practices and firms' cost of capital (Seltzer *et al.*, 2022), performance (Ferrell *et al*., 2016; Bolton and Kacperczyk, 2021), management and ownership (El Ghoul *et al.*, 2017; McGuinness *et al.*, 2017; McCarthy *et al.*, 2017). Apaydin *et al.* (2021) explain that the positive effects of CSR on firms' performance are theoretically established, but empirical findings are ambiguous. Gillan *et al.* (2021) provide a comprehensive literature review on firms and social responsibility. They explain that the literature shows that CSR activities can reduce risk and increase firm value, but the role of institutional ownership remains unclear. This is further supported by Liedong *et al.* (2017) and Walker *et al.* (2019).

We move this literature forward by exploring for the first time the links between CSR activities and firms' survival chances. Our work is focused on China, which is of particular interest due to the well-known government intervention approach to firms' business activities and green policy implementation (Chen, 2011). The government has undertaken several CSR initiatives over the last decades, including granting CSR rewards, tying bank financing to CSR scores, black-listing socially irresponsible firms and publicizing CSR rankings inter alia.[1]

The World Economic Forum (2015) shows that between 1999 and 2005, only 22 CSR reports were published in China, but subsequently, this number skyrocketed to approximately 1,600 in

[1] 2006 is considered a crucial year for the pro-CSR shift, as the Chinese Communist Party revised the domestic corporate law to formally include CSR in legislation. The Chinese Government took further CSR-friendly steps, such as the 'Guidelines on Social Responsibility - Shenzhen Stock Exchange', the 'Green Credit Guidelines', the 'Environmental Protection Agency Blacklist', the 'Research Report on Social Responsibility of China', and the 'Annual CSR awards by the People's Daily.' (Chen *et al.* (2018, p. 171-172)).

2006, highlighting the success of the implemented policy. Second, in China, government intervention is directly linked to the role of state ownership. SOEs are considered to be an effective macroeconomic policy transmission channel through which the government rapidly enhances lending and investment (Deng *et al.*, 2015). As such, these firms are subject to direct control by the central government.

We contribute to the CSR literature in three ways. First, we add to the general literature on the effect of CSR on Chinese firms' real activities. We bridge the gap in the CSR empirical research by analysing how socially responsible behaviour affects the overall survivorship status of firms while controlling for several financial and other firm-specific characteristics. For the case of China, there is no other work discussing firm survival prospects in conjunction with CSR. This is surprising, especially given that CSR has been a governmental and institutional focus point in recent decades in China. Only a handful of studies provide insights on this context. For example, Sun and Cui (2014) study suggest a negative link between failure risk and CSR, but they do not directly investigate the link between CSR and probability of survival, while they also do not focus on Chinese firms. Chemmanur *et al.* (2022) is the only study investigating the effect of CSR on firm's survival in a US setting. Their findings suggest that CSR rating is associated with a lower probability of corporate failure, but state-ownership is not evaluated.

Second, we advance the literature on survival, which shows that firms with worse balance sheet positions have a higher probability of bankruptcy as they suffer from higher levels of information asymmetry and agency costs (Bridges and Guariglia 2008; Farinha *et al.*, 2019). Considering recent evidence from El Ghoul *et al.* (2017), according to which CSR helps reduce transaction costs and improve access to resources, we move this literature forward by exploring the links between CSR activities and firms' survival chances.

While previous studies explore how ownership structure directly affects CSR (Li and Zhang, 2010; Bradshaw *et al.*, 2019), we explore whether the sensitivities of firms' survival prospects, due to changes in CSR, are stronger for SOEs. We argue that under the CSR-friendly agenda in

China, SOEs should undertake more CSR initiatives. The China State-owned Assets Supervision and Administration Commission has taken a series of actions to promote SOEs to improve their CSR performance since 2008. Thus, SOEs enjoy great advantages in financing and government subsidies in terms of CSR activities over their non-state-owned counterparts. To the best of our knowledge, our paper is the first to explore the effect of CSR practices as a survivorship driver in a government intervention setting.

Additionally, we are the first to document a 'green' mechanism through which CSR affects the probability of firms' failure. We find that once we split CSR into its different components, the environmental one seems to be driving the results. In other words, CSR activities, proxied as environmental performance, exert a positive effect on the survival of Chinese firms. This effect is stronger for SOEs. This is a novel outcome, which further supports the importance of the green credit policy in China. It also complements the work of Ren *et al.* (2022) who find that CSR disclosure has a positive impact on green innovation. Overall, these findings indicate that green CSR initiatives should be incorporated into firms' policies to tackle pressing environment issues and improve their overall healthiness.

Finally, our study contributes useful insights into the literature of CSR from a policy point of view, denoting the unique value of government intervention in China. Chinese SOEs are clearly seen as the 'Good Samaritans' pushing the CSR political agenda; hence, they are too important to fail. The study advances our understanding of the implications of environmental policy changes in an emerging market, such as China. More importantly, this study contributes to the CSR literature also in terms of policy shocks. So far, no study has examined the CSR-survival nexus relationship accompanied by significant policy reforms. By exploring the effect of an external (i.e., USA-China trade-war/covid-19 pandemic) or internal shock (i.e., implementation of Rule no.18 and/or the directive to enhance SOEs CSR activities), our empirical findings have important implications for policy makers, regulators and financial managers that want to promote CSR (Wen *et al.*, 2020).

We use a Cox proportional hazards model to determine the role of CSR activities on Chinese firms' survival prospects. Our analysis is based on a panel of 2,426 firm-year observations from Chinese listed firms over the period 2011–2019 and the Runlin Global Rankings (RKS) CSR scores. Our empirical findings show that CSR positively affects firm survival. This effect is stronger for SOEs, denoting the role of state ownership and government intervention in China.

However, legitimate endogeneity problems arise from investigating such a relationship. First, endogeneity may be caused by the reverse causality that runs from firms' survival status to CSR activities. It may well be that CSR activities in firms with a higher probability of survival are more likely to be engaged with CSR. Firms with better balance sheet conditions would be financially sound and therefore keener to invest in CSR projects. Another potential cause is omitted variable bias. It is possible that unobserved firm-specific characteristics may simultaneously affect the survival of firms and CSR.

To account for endogeneity concerns, we augment our analysis with several different approaches. First, we address omitted correlated variable and reverse causality bias by identifying instruments that satisfy relevance and exclusion conditions. Following prior literature on CSR (Bhandari and Javakhadze, 2017; Benlemlih and Bitar, 2018), we treat CSR activities using two valid instruments, 1) the initial level of a firm's CSR score and 2) a location-based variable. We use an Instrumental Variable (IV) approach and estimate a two-stage least squares (2SLS) regression. Second, we apply a Propensity Score Matching (PSM) to account for the possible endogenous nature of CSR. Third, we apply a Difference-in-Difference (DiD) approach on the PSM-matched sample to test the direction of plausible causality between CSR and firms' survival. We also matched firms using an Entropy Balancing (EB) method and apply the Rosenbaum-bounds (RB) approach. Finally, we use different exogenous shocks (i.e., a trade policy uncertainty and a government policy shock) to our CSR variable in quasi-natural experiments. Our robustness checks are also very extensive, namely using: i) an alternative CSR measure proxy by Hexun ratings (Li and Guo, 2022); ii) firm-level heterogeneity; iii) firm-location; iv) alternative treatment

groups; v) a unique CSR policy intervention for SOEs in China; vi) placebo tests and vii) endogenous switching regression model.

Our original results remain unchanged. Overall, there is strong evidence that supports the notion that CSR matters for a firm's probability of survival in China and that our results are unlikely to be driven by endogeneity concerns. Additionally, we find that highly constrained SOEs are associated with a higher probability of survival when they are CSR oriented. This is a novel finding that goes against the common idea that financially constrained firms face higher levels of credit weakness, and consequently, exhibit lower probabilities of survival. When we take the role of provinces into consideration, we show that the positive impact of CSR on survival is significant, especially for SOEs operating in the most financially developed regions or provinces with higher CSR intensities. We also show that the active fulfilment of social responsibility by SOEs driven by strict directives of the Chinese state increases the positive relationship between firms' survival and CSR activities.

The remainder of the paper is structured as follows. Section 2 develops our hypotheses, while Section 3 describes our data and presents summary statistics. The methodology is described in Section 4. Section 5 presents the main empirical results, while Section 6 presents the robustness checks. Finally, Section 7 provides concluding remarks. The appendix section provides technical information about the variables used.

2. Theoretical background and hypothesis development

2.1. CSR and firm survival in China

Several theoretical and empirical studies have focused on the importance of CSR regarding firms' performance. In our paper, the implementation of CSR is associated with stakeholder value maximization theory (Jensen and Meckling, 1976). As shareholders focus on the interests of stakeholders, rather than their own, this increases stakeholders' willingness to support CSR activities. Within this context, a firm can be seen as a "nexus of contracts" between shareholders

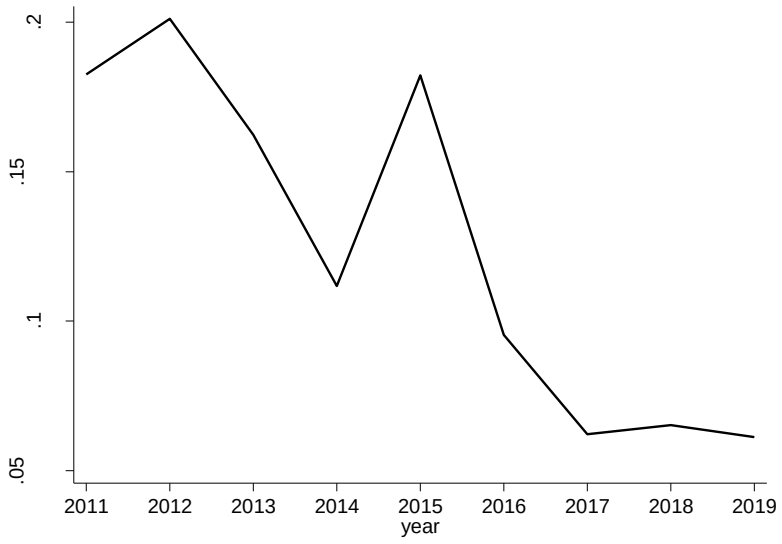
and stakeholders (Deng *et al.*, 2013). Deng *et al.* (2013) argue that firms with higher CSR activities usually hold a stronger reputation for keeping their commitments linked with implicit contracts. As such, stakeholders in higher CSR firms have stronger incentive to contribute to resources to the firm. This theory implies that the interests of shareholders and stakeholders are more aligned in a highly CSR friendly environment than in their lower CSR counterparts. This is also supported by the recent work of Chemmanur *et al.* (2022). Overall, under this view, CSR activities should exert a positive effect on firms' profitability, and therefore survival.

The empirical literature on the relationship between CSR and corporate failure is not as voluminous as that on investment or performance (Bhandari and Javakhadze, 2017; Benlemlih and Bitar, 2018; Apaydin et *al..*, 2021), but the general consensus is that CSR can play a positive role in firms' survival prospects. Previous studies that are closely related to our analysis are Sun and Cui (2014) and Chemmanur *et al.* (2022). The former provides evidence of the role of CSR in reducing firms' risk of default. The latter finds that CSR has a positive effect on US firms' survival prospects when considering the climate and pandemic crises.

Previous studies also provide evidence that CSR activities can increase transparency, attracting more socially responsible investors, decreasing firms' cost of equity (Cheng et *al.*, 2014). Therefore, CSR practices may be able to enhance firms' balance sheet positions. This should improve their future growth and eventually their survival prospects. El Ghoul *et al.* (2017) suggest that CSR strategic value is greater in emerging markets and countries with increased institutional voids, and CSR can help decrease transaction costs, facilitating access to resources. Their work is complemented by Marano *et al.* (2017), who rank China third in terms of institutional voids, only after Venezuela and the Russian Federation, and explain that CSR practices can alleviate firms' liabilities. In China, public concerns about environmental conditions started to be institutionally addressed in 2006 (Chen *et al.*, 2018). In that effort, the Chinese government does not necessarily require firms to increase spending on CSR, but it has implemented directives due to which Chinese firms are coerced to undertake socially responsible tasks.

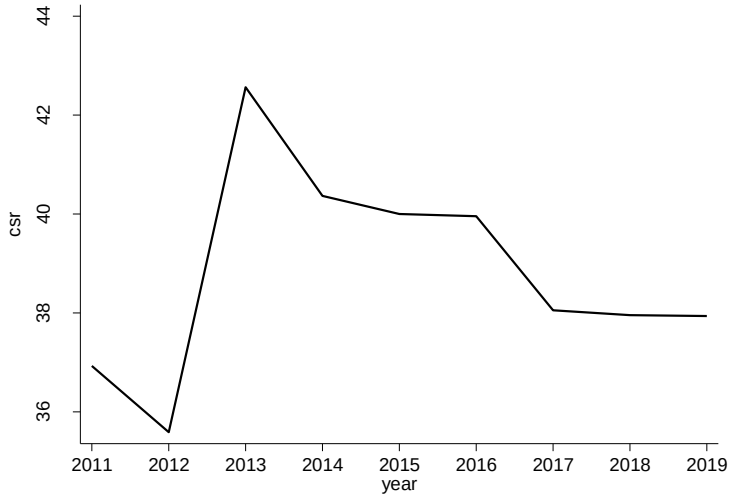
Would this mean that there is a direct link between CSR and firm survival in China? To see if it is worth investigating this, we estimate the average CSR score and average failure rate of Chinese listed firms across time. These are presented in the following figures:

Figure 1: Average failure rate for non-financial Chinese firms over the period 2011-2019



Note: The source of the graph is the authors' calculations based on the CSMAR database.

Figure 2: Average CSR score for Chinese firms over the period 2011-2019



Note: The source of the graph is the authors' calculations based on the RKS database.

These figures show the existence of a potential inverse relationship between CSR practices and failures, particularly in the period between 2011 and 2013. This could be attributed to the fact that responsible practices became institutionally mandated in China, especially after 2010. Tang *et al*. (2018) denote that the years 2011–2013 were pivotal for the evolution of intergovernmental relations in CSR policy formulation and guidance. Tashman *et al*. (2019) highlight that firms' survival is linked with the control actions undertaken by the Chinese government after the Beijing haze pollution incidents in early 2013. During that year, China's Ministry of Environmental Protection banned large corporations' investments due to lack of compliance with emission targets. Such governmental punitive initiatives heightened the link between CSR initiatives and firms' healthiness across China and led to extensive environmental legislation in 2014. Additionally, See (2009) also suggests that sustainable firms can enjoy lower government supervision. Chen *et al.* (2018) report that governments tie access to bank financing with CSR performance with high-polluting firms black-listed and fined. Conversely, firms with high CSR rankings receive government awards. The government also enables 'greener' firms to face lower bank loan barriers as suggested by Xing et al. (2017) and Li *et al.* (2022).

Based on the above, China is an important and interesting case to test the ground for the effects of CSR on firms' survival. These initiatives create a growth framework supported by government interventionism and funnelled through growing CSR adoption. However, the government's interventionist approach could potentially distort the true value of CSR. In order to probe this further, we hypothetise that the positive effect of CSR is lowering information asymmetry. Such positive link is also in line with the "nexus of contracts" theory which combined with the Chinese government recommendations provides a mechanism for firm growth, therefore increasing firms' probability of survival. Hence, our first testable hypothesis is as follows:

H1: *CSR has a positive impact on the survival prospects of Chinese firms.*

2.2. CSR and firm survival: the role of state ownership

Next, we explore whether the impact of CSR activities on firms' survival prospects is stronger for SOEs. State ownership ensures that SOEs fulfil any social or/and political agenda set up by the Chinese government (Huang *et al.*, 2017). Government intervention has led to the poor financial performance of SOEs over the past years (Chen *et al.*, 2011). Particularly, the low growth rates of SOEs can be attributed to their requirement to abide by their political connectedness and enhance social trust through activities potentially outside the scope of their economic objectives (Bai *et al.*, 2006). As a result, SOEs have access to cheap loans regardless of their level of profitability (Boyreau-Debray, 2003).

Previous empirical studies have shown that SOEs have better access to bank loans than their non-SOE counterparts due to government intervention (Chen *et al.*, 2011; Fan *et al.*, 2013). Chinese state-owned banks impose fewer restrictions on the capital budgeting decisions of poorly performing SOEs (Firth *et al.*, 2008). The situation for private firms is not the same. However, recently, all Chinese entities have faced greater pressure to engage in CSR activities. Young and Makhija (2014) also suggest that firm-level CSR responsiveness is positively related to the rule of law and labour-related regulations, which is the epitomy of government intervention in firms' operations.

Based on this, we hypothesise that SOEs, likely to be directly supported by the government, should have a higher probability of survival when performing CSR activities. This is consistent with two different arguments. First, that CSR activities should have a positive impact on shareholder value, as explained in an earlier section. Second, this effect should be stronger for those Chinese firms with government intervention (SOEs) as investing in CSR is part of the government agenda. Given that the interests of shareholders and stakeholders are more aligned in firms with higher CSR activities, this effect should be even stronger for firms with CSR government intervention. To this end, our second hypothesis is as follows:

H2: *The positive impact of CSR on survival prospects is stronger for SOEs.*

3. Data and summary statistics

To construct our dataset, we use annual reports from the Chinese Stock Market Trading Database (CSMAR). CSMAR provides us with the basic information, financial statements, and ownership structure data of listed Chinese firms. We select only firms with unconsolidated statements to avoid double-counting of firms (Fernandes *et al*., 2019). We start by constructing a sample of all A-share listed firms issuing CSR reports in China on either the Shanghai or Shenzhen Stock Exchanges from 2011 to 2019[2]. We collect the CSR ratings published by RKS, a leading third-party CSR-rating agency in China. RKS provides yearly CSR ratings (with scores available from 2009) that measure the CSR performance of firms based on their disclosed CSR reports. RKS builds their score index based on the framework of KLD and the standard of the Global Reporting Initiative (GRI3.0), but it is adapted to the Chinese context. It contains 70 indicators for 3 categories of firms' CSR practice: social responsibility strategy and innovation, disclosure content, and technical sufficiency. The RKS scores are the most extensively used CSR metrics in the literature (McGuinness *et al.*, 2017).

Focusing on the RKS measure, our final panel consists of 2,426 firm-year observations. We remove observations with negative sales and assets and drop firms that do not have complete records on the variables used. We control for the potential influence of outliers by excluding observations in the 1% tails of each of our regression variables.[3] The descriptive statistics of our variables are presented in Table 1.

[2] Here we should note that the RKS database offers CSR data up to 2019. After 2019, the rating company updated their CSR rating to an ESG rating. The two measurements are different and their use in the same panel is not compatible. However, we have explored the period 2011-2020 with the alternative CSR measure (see online appendix OA.7).

[3] Details about all variables and the structure of the panel are given in the appendix and the supplementary online appendix, respectively.

Table 1: Descriptive statistics (Failures/Ownership)

Variables	Total Sample	Fail=1	Fail=0	Diff.	SOEs	Non-SOEs	Diff.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$Fail_{it}$	0.167	1.000	0.000	-	0.153	0.200	0.009***
	(0.37)	(0.00)	(0.00)		(0.36)	(0.40)	
CSR_{it}	38.570	40.565	38.224	0.000***	39.583	37.897	0.005***
	(11.64)	(12.60)	(11.41)		(11.62)	(11.71)	
CSR_{it}^{H}	27.518	27.970	25.260	0.004***	27.843	27.010	0.000***
	(20.05)	(20.43)	(17.88)		(20.05)	(20.04)	
$Size_{\ it}$	25.640	25.620	25.650	0.052*	25.844	25.315	0.000***
	(1.34)	(1.26)	(1.36)		(1.32)	(1.28)	
$Collateral_{it}$	0.102	0.112	0.108	0.000***	0.104	0.107	0.023**
	(0.03)	(0.03)	(0.03)		(0.03)	(0.03)	
$Solvency_{it}$	0.657	0.700	0.651	0.003***	0.626	0.706	0.000****
	(0.28)	(0.29)	(0.27)		(0.27)	(0.28)	
$Profitability_{it}$	0.050	0.051	0.049	0.550	0.048	0.052	0.004***
	(0.05)	(0.05)	(0.05)		(0.05)	(0.05)	
Age_{it}	20.860	11.140	22.810	0.000***	16.181	27.20	0.000***
	(36.49)	(32.02)	(37.03)		(32.30)	(40.58)	
$GDPgrowth_{it}$	-0.354	-0.300	-0.367	0.054*	-0.474	-0.455	0.468
	(0.75)	(0.53)	(0.792)		(0.55)	(0.54)	
$Z-score_{it}$	0.482	0.531	0.472	0.047**	0.383	0.636	0.000***
	(0.63)	(0.63)	(0.63)		(0.64)	(0.57)	
$HighDiversified_{it}$	0.437	0.415	0.442	0.253	0.396	0.503	0.000***
	(0.50)	(0.49)	(0.50)		(0.489)	(0.50)	
HHI_{it}	0.167	0.142	0.192	0.594	0.170	0.120	0.112
	(0.03)	(0.09)	(0.05)		(0.08)	(0.06)	
$Sigma_{it}$	0.396	0.399	0.386	0.110	0.402	0.386	0.041**
	(0.19)	(0.19)	(0.09)		(0.19)	(0.18)	
Observations	2,426	532	1,894		1,572	838	

Note: The table presents sample means. Standard deviations are reported in parentheses. $Fail_{it}$ is a dummy that equals 1 in a given year if the firm is recorded as failed in that year and 0 otherwise. CSR_{it} is the CSR score obtained from RKS. CSR_{it}^{H} is the CSR score taken from the Hexun database. The remaining variables are defined as $Size_{it}$: Logarithm of total assets, $Collateral_{it}$: Tangible assets to total assets, $Solvency_{it}$: Shareholders' fund to total assets, $Profitability_{it}$: Earnings before interest and taxes to total assets, Age_{it}: Difference between the present year and the firms' date of incorporation $GDPgrowth_{it}$: Growth rate of the gross domestic product, $Z-score_{it}$: Modified Altman's Z score used by Sufi (2009), $HighDiversified_{it}$:A dummy variable which takes the value of 1 if a firm has a score of board diversity higher than the mean value of the whole sample in year t based on the Blau (1977) index, HHI_{it}: level of debt concentration in a firms' debt structure and $Sigma_{it}$: the firm's sigma (standard deviation of residuals from CAPM model). *P*-values for the tests of equality of means and unequal variances across relevant groups of firms are presented in columns 4 and 7. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

The figures are presented for all firms (column 1), for failed and surviving firms (columns 2 and 3) and for SOEs and non-SOEs (columns 5 and 6) reporting means and standard deviations. Moreover, the *p*-values of a test for the equality of means between failing and surviving firms as well as SOEs and non-SOEs are presented in columns 4 and 7, respectively. We can see that the average failure rate in our sample is 16.7%. Our figures are consistent with the Annual Survey of firms reported by the State Statistical Bureau in China. When comparing failing and surviving firms (Columns 2 and 3), we observed that the former have lower CSR engagement. On average, surviving firms are less solvent, older and have a lower bankruptcy risk. These findings are in line with Bridge and Guariglia (2008). The differences between subsamples are statistically significant in all cases (Column 4).

By comparing SOEs and non-SOEs (Column 5 and Column 6), we observe that the average failure rate is higher for non-SOEs than for their SOE counterparts. The relatively high number of insolvencies for non-SOEs can easily be explained by the fact that China is a state-dominated financial system that favours state ownership. Firms that are not linked to the state typically experience budget constraints, making it difficult to obtain large amounts of loans from the banking system (Guariglia *et al.,* 2011).

Concerning the CSR variable, we note that this variable takes an average CSR score of 40.19 for SOEs and 38.54 for non-SOEs. Once again, this difference is statistically significant. This confirms the commitment of SOEs to the Chinese government's environmental concerns and its attempt to enhance SOEs' involvement in CSR activities.[4]

[4] Summary statistics related to average CSR scores and firms' financial positions, the comparisons between large and small SOEs and non-SOEs can be found in the online appendix.

4. Empirical implementation and methodology

4.1. Baseline specification

The main goal of this study is to identify the extent to which CSR activities impact the survival prospects of firms in China. We implement a Cox proportional hazards model (Cox, 1972) that allows us to explore the association between firm survival and CSR , along with a set of firm-specific characteristics. Recent literature in the finance and economics fields have applied this technique to estimate the treatment effect on survival when accounting for other explanatory variables (Iwasaki, 2014; Caselli *et al.*, 2021; Chemmanur *et al.*, 2022). The Cox model is a semiparametric model and its main advantage over other hazards models is that the baseline hazard depends only on time *t* and, therefore, can take any form, while covariates enter the model linearly.[5] One of the advantages of this model is that it allows us to deal with censored data and data with different time horizons (Caselli *et al.*, 2021). Our data is considered to be right censored, which indicates that some of our firms may never fail. However, the model provides robust findings independently of the distribution of survival time (Baumöhl *et al.*, 2019). The baseline proportional hazards model is formulated as follows:

$$h(t|x_{in}) = h_0(t)\exp(\beta_n x_{in}),\ h_0(t) > 0 \quad (1)$$

where, $h(t)$ is the rate at which firms fail at time *t* given that they have survived until time *t-1* for a given number of covariates. $h_0(t)$ is the baseline hazard function at time t when all of the covariates are set to zero. In line with past literature (Bridges and Guariglia, 2008), we define a firm as failed in a given year when its status is 'dead'.[6] The β parameter indicates the impact of the explanatory variable x on the hazard rate. To test whether firm exit is affected by firm-specific

[5] Compared to parametric models, the results obtained from the estimation of the discrete Cox model are robust (Iwasaki, 2014). For further robustness, we have estimated our results also with a clog-log model. These results remain consistent with the ones generated from the discrete Cox approach. For the sake of space, these results are not presented here but are available upon request.

[6] The CSMAR Database reports firms as 'dead', but it does not distinguish whether firms in liquidation or receivership are included in this category. However, to ensure that the definition of 'dead' firms does not include takeovers, we use the Merger & Acquisition information provided by the CSMAR database. Details on the construction of our dependent variables are provided in Table A.1. Additionally, it should be noted that we use the term failures and survival interchangeably throughout the text.

CSR, we include the term CSR_{t-1} among the explanatory variables. The Cox model can be estimated through the maximum likelihood method by taking the logarithmic transformation on both sides of Equation (1), which is represented by the following linear model:

$$\ln h(t|x_{in}) = \ln h_0\,(t) + \sum_{j=1}^{n} b_j x_{ij} \qquad (2)$$

A statistically significant hazard ratio indicates how the probability of a firm's survival is multiplied when a specific covariate x_i changes by one unit.[7] In our case, the hazard rate of survival is given by the following equation:

$$h(t) = h_0(t)\exp(\beta_1 CSR_{it-1} + \beta_2 SOE_{it} + \beta_3 Size_{it-1} + \beta_4 Collateral_{it-1} + \beta_5 Solvency_{it-1} + \beta_6 Profitability_{it-1} + \beta_7 Age_{it-1} + \beta_8 GDPgrowth_{it-1} + \beta_9 Z - score_{it-1} + \beta_{10} HighDiversified_{it-1} + \beta_{11} HHI_{it-1} + \beta_{12} Sigma_{it-1} + Industry\ dummies + Year\ dummies\ ) \qquad (3)$$

where, $h(t)$ is the hazard function, $h_0(t)$ is the baseline hazard function obtained when all covariates are set to zero and *t* represents the failure time. β_1 measures the association between the CSR and the probability of failure, while β_2 measures the direct effect of state-ownership in firm survival. The dependent variable indicates failure risk, and therefore, a positive (negative) coefficient indicates that the failure is more (less) likely to happen. For example, a positive (negative) coefficient denotes a high (low) probability of firm failure and a short (long) survival time. To quantify the risk of default, we compute the hazard ratio for each parameter by taking the exponent form of the coefficient. A hazard ratio greater than 1 increases the likelihood of firm default, whereas a hazard ratio below 1 indicates that the covariate increases the probability of firm survival. The coefficient estimates are robust to any baseline hazard function h_0, implying

[7] Details on the model specification can be found in the online appendix.

that the specification is robust to any time-specific common factors (equivalent to controlling for year fixed effects (Boubakri *et al.*, 2017)).[8]

Our main variable of interest is CSR_{it-1}, as a yearly CSR score from RKS. This variable accounts for the effect of CSR activities at the firm-level. Our first research question addresses the influence of CSR activities on firms' survival prospects. We hypothesize that higher levels of CSR should positively affect firms' financial activities. As such, higher levels of CSR activities should be associated with higher chances of survival. We employ a proxy of CSR to capture the impact of a change in CSR activities on firm survival in China, as in McGuinness *et al.* (2017).

In addition to the CSR variable, a set of financial variables is included to capture the effects of financial health on the likelihood of survival. SOE_{it} is a dummy variable , which takes a value of one for SOEs and zero otherwise. SOE indicates whether the controlling shareholder is the government or not. Following Bridges and Guariglia (2008), we use collateral ($Collateral_{it-1}$) as the ratio of tangible assets to total assets. Farinha *et al.* (2019) show that firms with higher tangible assets are more likely to survive. Therefore, we expect firms with higher collateral ratios in their balance sheets to face lower probabilities of failure. Next, we control for solvency ($Solvency_{it-1}$), which is defined as the ratio of shareholders' funds to total assets. Previous studies (Guariglia *et al.*, 2008) show that this ratio is an indicator of firms' liquidity. Accordingly, we expect a negative relationship between solvency and firms' probability of default. To account for the level of firms' profitability, we use $Profitability_{it-1}$, which is measured as earnings before interest and taxes to total assets. According to Guariglia *et al.* (2008), internal funds can be considered as buffers that absorb internal losses. Hence, we expect to observe a negative association between profitability and the incidence of failure. The Z-score ($Zscore_{it-1}$), calculated as the modified Altman Z-score by Sufi (2009), is applied to capture bankruptcy risk.

[8] We test the proportional hazards assumption of the model on high vs. low CSR activities and SOEs vs. non-SOEs. Results show parallel lines for the two categories for both covariates, indicating a non-violation of the proportional hazards assumption.

In line with Farinha *et al.* (2019), we expect that firms that are in a better shape will be associated with a lower likelihood of exit.

Following the survival literature (Clementi and Hopenhayn, 2006; Baumöhl *et al.*, 2019), we also include a set of firm-specific characteristics. First, we introduce size ($Size_{it-1}$) as the logarithm of the firms' real total assets, and we anticipate that it has a positive relationship with the probability of survival, as large firms are less at risk of failure than small firms (Guariglia *et al.*, 2008). Next, we add age (Age_{it-1}), calculated as the number of years since the date of incorporation. Firms with an established track record are less likely to fail than their younger counterparts, as the former have acquired reputation in the market and, therefore, face a smaller liquidation risk (Hadlock and Pierce, 2010). As such, age is expected to have a negative relationship with the probability of failure. Finally, we typically control for macroeconomic conditions and demand factors by including the Gross Domestic Product (GDP_{it-1}). Furthermore, we look for a negative relation between GDP and corporate failures.

To account for debt, we control for the the concentration of debt structure of firms based on the adjusted Herfindahl–Hirschman Index (HHI_{it}) introduced by Colla *et al.* (2013). HHI_{it} is normalized between 0 and 1 as in Boubakri *et al.* (2021). As such, a firm has a low HHI when its debt structure is less concentrated, and a high HHI when its debt structure is highly concentrated in one or only a few debt types. We expect the effect on firm failure to be positive, as higher debt concentration suggests less debt flexibility.

Finally, to further account for potential effects from information asymmetry, we control for the firm's sigma ($Sigma_{it}$) and the respective board diversity ($HighDiversified_{it}$). In terms of $Sigma_{it}$, which is a measure of firm-specific uncertainty, we expect a positive sign as firms exposed to higher levels of information asymmetry, suffer from worse balance sheet conditions. This is consistent with the findings of Byrne *et al.* (2016) on firm survival. $HighDiversified_{it}$ is a dummy variable taking the value of 1 if a firm has a score of board diversity (in terms of gender, education and age) higher than the mean value of the whole sample in year *t* based on the

Blau (1977) index. Controlling for board diversity in China is important as explained in Cumming and Leung (2021). We expect firms with highly diversified boards to be less prone to engage in corporate fraud (and hence more likely to survive) and more likely to support CSR. This is in line with the findings of Do *et al.* (2022). We also control for the industry and business cycle effect by including a set of industry and time dummies, respectively.

4.2. The effect of state ownership

Next, we investigate whether the relationship between CSR activities and firm survival is stronger for SOEs. Equation (3) is augmented with an interaction term between SOE_{it} and CSR_{it-1}. The remaining control variables and fixed effects remain unchanged. The model takes the following form:

$$h(t) = h_0(t)\exp(\beta_1 CSR_{it-1} + \beta_2 SOE_{it} + \beta_3 CSR_{it-1} * SOE_{it} + \beta_4 Size_{it-1} + \beta_5 Collateral_{it-1} + \beta_6 Solvency_{it-1} + \beta_7 Profitability_{it-1} + \beta_8 Age_{it-1} + \beta_9 GDPgrowth_{it-1} + \beta_{10} Z - score_{it-1} + \beta_{11} HighDiversified_{it-1} + \beta_{12} HHI_{it-1} + \beta_{13} Sigma_{it-1} + Industry\ dummies + Year\ dummies) \quad (4)$$

To support *H2*, we focus on the β_3 coefficient. A negative coefficient of the interaction term implies that the negative effect of CSR in the probability of failure is more prominent for SOEs.

This hypothesis is also motivated by the multitask theory of Bai *et al.* (2006), according to which SOEs provide social stability, and hence, they benefit from increased government intervention and support. Even in an environment of pressure towards mandatory CSR disclosure (as described by Chen *et al.*, 2018), we expect our hypothesis to still be verified. Within such a framework, SOEs' balance sheet positions would be exposed to more CSR expenses and, consequently, to increased debt-servicing costs. However, the former are expected to receive higher financial support from the government compared to the latter. As such, we expect the chances of survival to be stronger for SOEs. Here, it should be noted that El Ghoul *et al.* (2017)

highlight the positive effect of CSR in the reduction of transaction costs, but they do not account for SOEs, and as such, they cannot capture the above differentiation.

4.3. Capturing endogeneity

Although we have shown a significant effect of CSR activities on decreasing the probability of Chinese firms' failure. This inference may be subject to endogeneity concerns. We take several steps to address this issue by conducting an IV analysis and a propensity score matching and a difference-in-difference analysis.

4.3.1 Instrumental Variable (IV) Analysis

Initially, we include firm-fixed effects in our panel regression to account for unobservable time-invariant characteristics that may affect our findings. We then apply an IV approach to address the possibility of reverse causality or any omitted bias. Specifically, we re-estimated regressions (3)-(4) using 2SLS regressions based on two instruments that could be exogenous to the CSR scores variable. Following Bhandari and Javakhadze (2017), we first employ the initial level of a firm's CSR score as an instrument ($First_{it-1}$). We also use the local CSR score (Zip_{it-1}), defined as the median CSR score in the city where the firm is headquartered (or registered). According to the authors, when location fixed effects are present, Zip_{it-1} is unlikely to affect our dependent variable; however, it would impact the CSR score of a particular local firm. We further discuss the selection of these two selected instrumental variables in the online appendix.

4.3.2 PSM approach, the Rosenbaum test and Entropy Balancing (EB) method

We also employ a PSM approach (Rosenbaum and Rubin, 1983). This procedure allows us to verify the causality between firm survival and CSR activities. We first apply the PSM approach

by estimating a probit model to explain the likelihood of a firm having a higher level of CSR activities ($High\_CSR_{it}$) on observed firm-specific characteristics. Next, we match using the nearest-neighbour approach without replacement (within each year and industry) each explanatory variable so that the means of each characteristic are as similar as possible between the treated and control groups after matching. This will allow us to replicate regressions (3)-(4) and examine whether our CSR-survival relationship remains significant after matching. In addition, to enhance the robustness of our results around the endogeneity, we also apply the diagnostic test of Rosenbaum's (2002) bounds and the Entropy Balancing (EB) method developed by Hainmueller (2012).

Finally, to further convince that our results are not driven by endogeneity, we use two quasi-natural experiments with a PSM-DiD on our comparable groups of treated and control firms from the samples obtained from the previous sections. We focus on the effects of the USA-China trade war during 2018 and the rule no.18 directive by the Chinese government in 2013. More details for these quasi-experiments and the relevant empirical specifications are provided in the online appendix OA.3.

5. Empirical results

5.1. Is there a relationship between CSR and survival?

We begin by assessing whether CSR exerts a positive effect on firms' survival prospects. These results are summarized in Table 2. Our baseline results (Column 1) show that the coefficient associated with socially responsible practices (CSR_{it-1}) is negative and statistically significant. A negative coefficient implies a hazard ratio below 1, suggesting that an increase in the covariate of CSR reduces probability of failure. This is in line with our expectation, as firms involved in CSR activities are able to mitigate their agency costs and information asymmetry. This finding is also economically important. The CSR is associated with a hazard ratio of 0.965, and therefore, am

one-unit improvement in CSR increases a firm's survival probability by 3.5 % (1- 0.965). Equivalently, SOE_{it} is associated with a hazard ratio of 0.812 suggesting that the survival probability is 18.8% higher for a state-owned firm, regardless of their CSR engagement.[9]

All control variables are found to be statistically significant at least at 10% level and in most cases appear to have the expected signs. Larger firms tend to have a lower probability of failure than small ones, indicated by the negative coefficient of $Size_{it-1}$. Collateral ($Collateral_{it-1}$) is negatively linked with firms' failure prospects. Firms with a higher level of asset tangibility are more likely to pledge collateral for external finance (Bridges and Guariglia, 2008). The coefficient of the solvency variable ($Solvency_{it-1}$) indicates that liquidity negatively affects the probability of failure. This is in line with evidence presented by other studies (Mateut *et al.*, 2006). Profitability ($Profitability_{it-1}$) exerts a negative and significant effect on failure which is consistent with past studies (Guariglia *et al.*, 2008). The negative sign associated with the age variable (Age_{it-1}) is in line with previous theoretical and empirical studies, which demonstrate that failure rates decrease with the firms' track record (Clementi and Hopenhayn, 2006).[10] The results concerning GDP_{it-1} show that improved economic conditions decrease the probability of failure. Finally, $Z-score_{it-1}$ shows that firms in better shape are associated with a lower likelihood of exit.

In terms of board diversity ($HighDiversified_{it-1}$), we find the expected negative sign. Highly diversified boards are less prone to engage in corporate fraud (and hence the respective firms more likely to survive) and more likely to support CSR, consistent with Do *et al.* (2022). When controlling for debt through HHI_{it-1}, the effect is positive indicating that higher debt concentration increases probability of failure. This is expected as higher debt concentration is a characteristic of opaque firms that rely on fewer types of debt financing and generally less

[9] The relevant hazard ratios are presented in the online appendix OA.2.

[10] In our regressions we have also employed $SIZE^2$ and AGE^2 to control for nonlinear effects. The results, which are not presented due to limitations of space, remain consistent with the ones presented in the main text. These are available upon request.

profitable. Finally, $Sigma_{it-1}$ indicates that firm with higher levels of information asymmetry, are associated with higher probability of failure as in Byrne *et al.* (2016).

Table 2: CSR, survival prospects and state ownership

	Baseline **(1)**	**SOEs** **(2)**
CSR_{it-1}	-0.035**	-0.033**
	(-2.37)	(-2.10)
SOE_{it}	-0.208**	-0.265***
	(-2.23)	(-2.69)
$CSR_{it-1} * SOE_{it}$		-0.876***
		(-3.19)
$Size_{it-1}$	-0.323***	-0.303***
	(-7.68)	(-7.07)
$Collateral_{it-1}$	-0.049**	-0.055***
	(-2.50)	(-2.71)
$Solvency_{it-1}$	-0.153***	-0.134***
	(-6.28)	(-5.54)
$Profitability_{it-1}$	-0.223**	-0.185*
	(-2.06)	(-1.80)
Age_{it-1}	-0.082***	-0.086***
	(-4.10)	(-4.23)
$GDPgrowth_{it-1}$	-0.228**	-0.231**
	(-2.00)	(-2.00)
$Z - score_{it-1}$	0.024***	0.025***
	(2.79)	(2.92)
$HighDiversified_{it-1}$	-0.190**	-0.173*
	(-2.06)	(-1.84)
HHI_{it-1}	0.259***	0.249***
	(8.97)	(8.29)
$Sigma_{it-1}$	0.153***	0.157***
	(6.55)	(6.67)
Observations	2,426	2,410
Log pseudolikelihood	-3,089	-3,061
Wald (chi-square)	539.40	859.04
Pr> Wald (p-value)	0.000	0.000

Note: All specifications are estimated using the discrete Cox proportional hazards model of probability of failure. The dependent variable is a dummy equal to one if the firm fails and zero otherwise. Robust z-statistics are presented in parentheses. Industry and year fixed effects are included in the models. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

5.2. The role of state ownership

Having established that CSR activities are negatively associated with the probability of exit in China, we next investigate whether this association is more prominent across SOEs. Column 2 in Table 2 presents the results of this analysis. We observe a negative and statistically coefficient for $CSR_{it-1} * SOE_{it}$. This is in line with our expectations. The interaction term is associated with a hazard ratio of 0.416, implying that a one-unit improvement in CSR increases the survival probability of a SOE by 58.4%. A negative and highly significant effect of CSR and state-ownership on the likelihood of exit for Chinese listed firms remain.

The results suggest that there is large increase in the survival prospects associated with SOEs that improve their CSR profile. This makes the government intervention channel very prominent. The agenda to promote social stability and CSR activities and the associated government benefits allows SOEs to borrow more from banks, even if they face a priori worse balance sheet conditions. Based on government guidelines, SOEs perform more CSR activities and simultaneously mitigate agency costs and information asymmetry, increasing their survival chances. The remaining control variables continue to be statistically significant and behave as expected.

Although the above results are interesting, it could be argued that the channel of how SOEs benefit from government intervention when they are CSR engaged is not so clear. One could rush to the simple explanation of 'too important to fail'. SOEs' failures are bad press for the Chinese government, especially if they involve SOEs that are highly involved in sustainability projects and CSR promoting investments. To probe deeper into this potential government intervention support channel for such SOEs, we replicate the results of Table 2 accounting for the different CSR RKS components. The results are presented in Table 3.

The baseline results show that the environmental component (c_{it-1}) of the RKS score has a positive and significant effect on firm survival along with the component that evolves around strategy and governance (m_{it-1}). The technicality sub-indicator (t_{it-1}) is found also significant, while the industry component is not significant. Interestingly, one-unit improvement in c_{it-1} is associated with the highest improvement in survival prospects (17.4% - hazard ratio of 0.826).

However, our main focus is to identify what drives firms' survival after accounting for state ownership. Empirical findings in column 2 of Table 3 shows that only $c_{it-1} * SOE_{it}$ coefficient remains statistically significant and negative. Additionally, one-unit improvement in the environmental component of the CSR of an SOE can decrease its probability of failure by 18.5% (hazard ratio of 0.815). Interestingly, the other components, are not statistically significant. This result proves that there is an easier pathway to survival for SOEs when engaged in activities that are particularly related to CSR environmental performance.

Table 3: CSR components, survival prospects and state ownership

	Baseline (Components) (1)	**SOEs (Components) (2)**
c_{it-1}	-0.191**	-0.260***
	(-2.43)	(-2.83)
t_{it-1}	-0.107***	-0.148***
	(-6.56)	(-6.21)
i_{it-1}	-0.044	-0.057
	(-1.02)	(-0.85)
m_{it-1}	-0.068***	-0.089
	(-2.89)	(-1.42)
SOE_{it}	-0.327***	-0.367***
	(-3.32)	(-3.61)
$c_{it-1} * SOE_{it}$		-0.703**
		(-2.22)
$t_{it-1} * SOE_{it}$		0.139
		(1.39)
$i_{it-1} * SOE_{it}$		0.010
		(0.13)
$m_{it-1} * SOE_{it}$		0.004
		-0.08)
$Size_{it-1}$	-0.261***	-0.266***
	(-5.56)	(-5.65)
$Collateral_{it-1}$	-0.062***	-0.035*
	(-3.56)	(-1.68)
$Solvency_{it-1}$	-0.112***	-0.115***
	(-4.35)	(-4.43)
$Profitability_{it-1}$	-0.188*	-0.239**
	(-1.67)	(-2.16)
Age_{it-1}	-0.084***	-0.090***
	(-4.18)	(-4.43)
$GDPgrowth_{it-1}$	-0.410***	-0.422***
	(-3.39)	(-3.55)
$Z - score_{it-1}$	0.019**	0.020**
	(2.24)	(2.25)
$HighDiversified_{it-1}$	-0.190**	-0.194**
	(-1.97)	(-2.02)
HHI_{it-1}	0.294***	0.235***
	(4.70)	(3.73)
$Sigma_{it-1}$	0.150***	0.152***
	(6.06)	(6.16)
Observations	2,176	2,176
Log pseudolikelihood	-2,829	-2,814
Wald (chi-square)	660.33	1,746.81
Pr> Wald (p-value)	0.000	0.000

Note: All specifications are estimated using the discrete Cox proportional hazards model of probability of failure. The dependent variable is a dummy equal to one if the firm fails and zero otherwise. Robust z-statistics are presented in parentheses. Industry and year fixed effects are included in the models. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

This is a novel outcome in the relevant empirical literature, but it should not come as such a surpise. It is not a secret that the Chinese government has shifted its environmental focus since 2007 with the introduction of the green credit policy (Xing *et al.*, 2021). From a theoretical perspective, the Chinese green credit policy focuses on environmental improvement (Sun *et al.*, 2019). However, it generates practical opportunities or constraints for firms. For example, firms can achieve cheaper financing and increased liquidity if they can showcase eco-friendliness and enhanced sustainable corporate practices. The above can be achieved by high-quality environmental disclosure and spending on green innovation intensity (Teeter and Sandberg, 2017). The climate change challenges have been a focal point in international diplomacy over the last decade. Chinese compliance with green innovation and emissions reduction has been a constant demand. The Chinese government is under pressure, more than ever before, to intervene and support projects that promote the CSR agenda and the green credit policy. The effect of this is manifested at firms (Wang *et al.*, 2021) and banks (Zhou *et al*., 2021). SOEs, especially large ones, should be the leaders in this, and their failure can only be the last resort. However, keeping all SOEs afloat is not so easy. Reuters (2021) reports that large SOEs suffer from ambitious sustainability plans, mixed government signals across provinces and exposure to higher and debt.

5.3. Endogeneity

Following the empirical setup of subsection 4.3, we present the results of our IV approach in the Table 4. The results obtained for the instruments used for the first- and second-stage regressions paint a clear picture. CSR and state-ownership continues to exert a negative effect on the probability of survival. The negative and statistically significant effect of $CSR_{it-1} * SOE_{it}$, independent of the instruments used. The F-test associated with the first-stage regression is greater than 10, suggesting that our instruments have high explanatory power and, therefore, are valid. The Cragg-Donald test shows a p-value of less than 0.05, indicating that the instruments are not

weak, while the Kleibergen-Paap test shows that the instruments are adequate to identify the equations (i.e., a *p*-value smaller than 0.05). In other words, the relationship between the included endogenous regressors and the instruments is sufficiently strong to justify inference from our results. Finally, the Sargan test suggests that the instruments are adequately used. We have also replicated these results, controlling for year and firm-fixed effects. The findings are consistent with those of Table 4.[11] Overall, we alleviate concerns that the negative relationship between CSR activities and firm survival is likely to be due to other confounding factors.[12]

[11] For the sake of space, we do not include these results in the manuscript, but they are available upon request.

[12] To be more specific, we enhance the reliability of our results by also assessing the appropriateness of the IVs following the work of Larcker and Rusticus (2010). For the baseline model, in the first stage, the partial R-square values are 2.7%, 3.1% and 8.9% while the partial F-statistics are 93.22, 82.02, 57.3, respectively. Similar analysis can be done for the SOEs specifications. The coefficients of IVs, together with high F-statistics demonstrate that IVs used in the analysis are not weak instruments. Therefore, taken together the statistical tests suggest that our IVs satisfy both relevance and exclusion criteria, and are valid.

Table 4: Endogeneity - Instrumental Variable Approach

	Panel A: Baseline model						Panel B: SOEs					
	First		*Zip*		*First & Zip*		*First*		*Zip*		*First & Zip*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
CSR_{it-1}		-0.017**		-0.020***		-0.016**		-0.018*		-0.046*		-0.014**
		(-2.24)		(-3.03)		(-2.35)		(-1.70)		(-1.92)		(-2.12)
SOE_{it}	-0.057*	-0.040**	-0.057*	-0.047**	-0.038**	-0.043***	-0.029*	-0.021***	-0.079**	-0.031*	-0.084***	-0.036**
	(-1.69)	(2.42)	(-1.68)	(-2.74)	(-2.17)	(-2.51)	(-1.58)	(-2.92)	(-2.49)	(-1.78)	(-2.84)	(-2.10)
$CSR_{it-1} * SOE_{it}$								-0.084***		-0.247***		-0.264*
								(-2.84)		(-3.46)		(-1.92)
$First_{it-1}$	-0.067***				-0.093***		-0.069***				-0.027***	
	(-14.43)				(-17.44)		(-22.09)				(-8.85)	
Zip_{it-1}			-0.117***		-0.030***				-0.010***		-0.016***	
			(-52.76)		(-5.41)				(-4.70)		(-4.85)	
$First_{it-1} * SOE_{it}$							-0.013***				-0.012***	
							(-52.35)				(-16.35)	
$Zip_{it-1} * SOE_{it}$									-0.014***		-0.014***	
									(-43.77)		(-44.12)	
$Size_{it-1}$	-0.044***	-0.019**	-0.164***	-0.020**	-0.022***	-0.023***	-0.016**	-0.014**	-0.024**	-0.018*	-0.018*	-0.012*
	(-2.64)	(-2.47)	(-2.89)	(-2.42)	(-2.82)	(-3.08)	(-1.98)	(-1.66)	(-2.15)	(-1.68)	(-1.72)	(-1.92)
$Collateral_{it-1}$	-0.012***	-0.026**	-0.053*	-0.015***	-0.016**	-0.043**	-0.148***	-0.163***	-0.019*	-0.025*	-0.051*	-0.006**
	(-3.23)	(-2.08)	(-1.77)	(-3.85)	(-4.45)	(-2.57)	(-6.75)	(-6.94)	(-1.89)	(-1.68)	(-1.78)	(-2.18)
$Solvency_{it-1}$	-0.012*	-0.030**	-0.027***	-0.010*	-0.009*	-0.077***	-0.190***	-0.183**	-0.006**	-0.061***	-0.009*	-0.007*
	(-1.71)	(-2.08)	(-3.70)	(-1.93)	(-1.69)	(-3.79)	(-8.61)	(-8.38)	(-2.27)	(-3.20)	(-1.65)	(-1.80)
$Profitability_{it-1}$	-0.165*	-0.139*	-0.098**	-0.169*	-0.191*	-0.171***	-0.196**	-0.195**	-0.165*	-0.184*	-0.192*	-0.178*
	(-1.67)	(-1.83)	(-2.55)	(-1.70)	(-1.88)	(-4.14)	(-2.31)	(-2.39)	(-1.68)	(-1.80)	(-1.80)	(-1.67)
Age_{it-1}	-0.015***	-0.014***	-0.092***	-0.015***	-0.011***	-0.013***	-0.007***	-0.013***	-0.005*	-0.014***	-0.006**	-0.013***
	(-7.24)	(-6.78)	(-5.62)	(-6.86)	(-4.79)	(-6.25)	(-3.11)	(-6.12)	(-1.69)	(-6.00)	(-2.56)	(-6.30)
$GDPgrowth_{it-1}$	-0.838***	-0.499**	-0.287*	-0.225***	-0.359***	-0.269***	-0.045***	-0.500***	-0.600*	-0.622***	-0.598***	-0.429***
	(-2.78)	(-4.70)	(-1.71)	(-2.81)	(-6.76)	(-8.34)	(-3.26)	(-2.75)	(-1.78)	(-4.20)	(-2.15)	(-6.31)
$Z - score_{it-1}$	0.006*	-0.002	0.023*	0.177**	0.027*	0.030***	0.008***	0.047***	0.040***	0.018**	0.077***	0.040*
	(1.72)	(-1.03)	(1.70)	(3.80)	(1.65)	(3.81)	(3.27)	(4.99)	(3.89)	(2.54)	(5.25)	(2.55)
$HighDiversified_{it-1}$	-0.041**	-0.039**	-0.032**	-0.041**	-0.034**	-0.035**	-0.146**	-0.042**	-0.039**	-0.042*	-0.029*	-0.042***
	(-2.55)	(-2.46)	(-2.01)	(-2.54)	(-1.99)	(-2.16)	(-2.30)	(-2.57)	(-2.31)	(-1.86)	(-1.82)	(-2.60)
HHI_{it-1}	0.164***	0.258***	0.103***	0.109***	0.104***	0.102***	0.087***	0.094***	0.105***	0.048***	0.071***	0.108***
	(6.77)	(5.40)	(6.96)	(6.89)	(6.23)	(6.22)	(5.53)	(3.53)	(4.66)	(2.92)	(4.88)	(6.65)
$Sigma_{it-1}$	0.200***	0.125***	0.258***	0.105***	0.102***	0.191***	0.136***	0.137***	0.110*	0.047**	0.023**	0.011**
	(5.92)	(6.43)	(5.40)	(7.04)	(6.18)	(6.76)	(6.89)	(6.83)	(1.88)	(1.95)	(2.19)	(2.30)
Observations	2,426	2,426	2,426	2,426	2,426	2,426	2,410	2,410	2,410	2,410	2,410	2,410
Adj. R-squared	0.810	0.882	0.852	0.828	0.707	0.809	0.867	0.839	0.857	0.819	0.979	0.801
Partial R-squared	0.027		0.031		0.068		0.053		0.061		0.089	
Partial F-statistics	93.22		82.02		97.34		82.64		84.40		98.01	
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
Test of excluded instruments (F-test)	2,783.51		4,548.46		2,054.12		2,239		2,231		2,386	
KP Wald (p-value)	0.000		0.000		0.000		0.000		0.000		0.000	
Cragg-Donald Wald (p-value)	0.000		0.000		0.000		0.000		0.000		0.000	
Hansen-J (p-value)	0.603		0.068		0.823		0.086		0.512		0.532	

Note: This table reports the results of the 2SLS regressions. Panels A and B show the results corresponding to H1 and H2, respectively. Column 1 (Column 3) of Panel A reports the results for the first-stage regression, where $h(t) = h_0(t)\exp(\beta_1 SOE_{it} + \beta_2 Instr_{it-1} + \beta_3 Size_{it-1} + \beta_4 Collateral_{it-1} + \beta_5 Solvency_{it-1} + \beta_6 Profitability_{it-1} + \beta_7 Age_{it-1} + \beta_8 GDPgrowth_{it-1} + \beta_9 Z - score_{it-1} + \beta_{10} HighDiversified_{it-1} + \beta_{11} HHI_{it-1} + \beta_{12} Sigma_{it-1} + Industry\ fixed\ effects + Year\ fixed\ effects)$, where $Instr_{it-1}$ is an instrumental variable $First_{it-1}(Zip_{it-1})$, measured as the initial level of a firm's CSR score (as the median CSR in the city where the firm is headquartered). In Column 5, the instrumental variable is composed of both $First_{it-1}$and Zip_{it-1} as instruments. Columns 2, 4 and 6 show the equivalent second-stage regressions: $h(t) = h_0(t)\exp(\beta_1 \widehat{CSR_{it-1}} + \beta_2 SOE_{it} + \beta_3 Size_{it-1} + \beta_4 Collateral_{it-1} + \beta_5 Solvency_{it-1} + \beta_6 Profitability_{it-1} + \beta_7 Age_{it-1} + \beta_8 GDPgrowth_{it-1} + \beta_9 Z - score_{it-1} + \beta_{10} HighDiversified_{it-1} + \beta_{11} HHI_{it-1} + \beta_{12} Sigma_{it-1} + Industry\ fixed\ effects + Year\ fixed\ effects)$. In Panel B, columns 7, 9 and 11 present the results for the first-stage regressions: $h(t) = h_0(t)\exp(\beta_1 SOE_{it} + \beta_2 Instr_{it-1} + \beta_3 Instr_{it-1} * SOE_{it} + \beta_4 Size_{it-1} + \beta_5 Collateral_{it-1} + \beta_6 Solvency_{it-1} + \beta_7 Profitability_{it-1} + \beta_8 Age_{it-1} + \beta_9 GDPgrowth_{it-1} + \beta_{10} Z - score_{it-1} + \beta_{11} HighDiversified_{it-1} + \beta_{12} HHI_{it-1} + \beta_{13} Sigma_{it-1} + Industry\ fixed\ effects + Year\ fixed\ effects)$, where $Instr_{it-1}$ is as in Panel A. Columns 8, 10 and 12 report the second-stage regressions: $(t) = h_0(t)\exp(\beta_1 \widehat{CSR_{it-1}} + \beta_2 SOE_{it} + \beta_3 \widehat{CSR_{it-1}} * SOE_{it} + \beta_4 Size_{it-1} + \beta_5 Collateral_{it-1} + \beta_6 Solvency_{it-1} + \beta_7 Profitability_{it-1} + \beta_8 Age_{it-1} + \beta_9 GDPgrowth_{it-1} + \beta_{10} Z - score_{it-1} + \beta_{11} HighDiversified_{it-1} + \beta_{12} HHI_{it-1} + \beta_{13} Sigma_{it-1} + Industry\ fixed\ effects + Year\ fixed\ effects)$. The test of excluded instruments tests whether the excluded instruments are distributed independently of the error process. The Kleibergen-Paap rk LM test is an under-identification test that tests whether the instruments are adequate to identify the equation. The Cragg-Donaldson Wald statistics are distributed as chi-square under the null that the equation is unidentified. The Sargan/Hansen J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Robust standard errors adjusted for heteroskedasticity are reported in parentheses. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

The PSM strategy is evaluated next, and it is found to be robust. Table 5 (Panel A) shows that firm-specific characteristics exert a similar effect on our dependent variable, when considering firms with a higher CSR propensity ($High\_CSR_{it}$). We next compare the mean statistics of the full sample and the PSM sample in Panel B. In our full sample, firms with higher CSR activities have significantly different firm-specific characteristics. All firms' characteristics in the PSM sample are not significantly different between the high and low CSR firms. As such, PSM appears to be effective in generating a balanced panel. This is important, as we can explore CSR sensitivities through the matched sample. If CSR activities are irrelevant, then we should not find any significant effect of CSR in the regressions using this sample. However, this is not the case. In fact, CSR continues to exert a negative effect on the probability of failure, with the coefficient of the interaction term ($CSR_{it-1} * SOE_{it}$) remaining negative and statistically significant (Panel C). The negative and statistically significant effect of SOE_{it} remains. Finally, Panel D reports the outcome of the sensitivity analysis. The findings suggest that a missing covariate should increase the likelihood of CSR activities to firms' failure by more than 70% to invalidate our PSM-based findings. Therefore, these results continue to suggest that our empirical results are unlikely to be due to the endogenous nature of CSR. In online appendix OA.3 we present the complementary panel of Table 5 regarding the USA-China trade war (external shock) and implementation of rule no.18 (internal shock), which shows that the CSR-survival relationship nexus remains robust under these quasi-experiments.

Finally, we also implement the EB method in Table 6. Panel A shows that the sample size is larger than the PSM and that the balanced variables in our model converge in all three dimensions (mean, variance and skewness). Panel B regressions remain consistent with our main findings. Overall, results from these identification strategies (i.e., 2SLS, PSM, Rb and EB) indicate that our findings are unlikely to be driven by endogeneity problems. Here it should be noted that we experimented with different cut-off points for the treatment and control groups of PSM and EB. The results remain insensitive to these changes, and they are presented in the online appendix.

Table 5: Endogeneity – Propensity score matching approach (median)

Panel A: High CSR

Dependent Variable	$High\_CSR_{it} = 1$
SOE_{it}	-0.145***
	(-2.74)
$Size_{it-1}$	-0.292***
	(-11.42)
$Collateral_{it-1}$	-0.029**
	(-2.10)
$Solvency_{it-1}$	-0.041***
	(-2.71)
$Profitability_{it-1}$	-0.135**
	(-2.21)
Age_{it-1}	-0.030***
	(-4.03)
$GDPgrowth_{it-1}$	-1.213*
	(-1.71)
$Z-score_{it-1}$	0.011*
	(1.89)
$HighDiversified_{it-1}$	-0.113**
	(-2.12)
HHI_{it-1}	0.107**
	(2.06)
$Sigma_{it-1}$	0.052*
	(1.92)
Industry FE	Yes
Year FE	Yes
R-square	0.590
Observations	2,472

Panel B: Univariate Statistics

Full sample	Treatment	Control	Difference	t-Statistics	p-Value
SOE_{it}	0.639	0.588	0.051	2.600	0.009
$Size_{it-1}$	25.755	25.166	0.589	11.060	0.000
$Collateral_{it-1}$	10.011	10.246	-0.235	-2.420	0.016
$Solvency_{it-1}$	6.297	6.587	-0.290	-2.710	0.007
$Profitability_{it-1}$	0.496	0.458	0.038	2.110	0.035
Age_{it-1}	2.282	1.712	0.571	3.960	0.000
$GDPgrowth_{it-1}$	-0.445	-0.424	-0.022	-0.670	0.504
$Z-score_{it-1}$	4.619	4.759	-0.140	-0.580	0.560
$HighDiversified_{it-1}$	0.412	0.455	0.043	2.180	0.029
HHI_{it-1}	0.011	0.006	0.006	0.950	0.340
$Sigma_{it-1}$	4.252	4.382	-0.130	1.790	0.073
Observations	1,462	1,010			
Matched sample					
SOE_{it}	0.639	0.612	0.027	0.410	0.523
$Size_{it-1}$	25.755	25.772	0.016	0.210	0.761
$Collateral_{it-1}$	9.897	10.011	-0.114	-0.790	0.239
$Solvency_{it-1}$	6.297	6.278	0.018	0.110	0.861
$Profitability_{it-1}$	0.513	0.501	0.013	0.620	0.332
Age_{it-1}	2.282	2.159	0.124	0.540	0.401
$GDPgrowth_{it-1}$	-0.445	-0.422	0.023	0.460	0.464
$Z-score_{it-1}$	4.439	4.462	-4.233	-0.640	0.329
$HighDiversified_{it-1}$	0.553	0.420	0.030	1.440	0.174
HHI_{it-1}	0.011	0.004	0.068	1.230	0.207
$Sigma_{it-1}$	4.252	4.267	0.015	0.140	0.831
Observations	1,082	1,082			

Panel C: Survival Sensitivities

	(1)	(2)	(3)	(4)
CSR_{it-1}	-0.044**	-0.064***	-0.051***	-0.071***
	(-2.14)	(-3.25)	(-2.60)	(-3.75)
SOE_{it}	-0.417***	-0.440***	-0.406***	-0.124***
	(-3.33)	(-3.52)	(-3.41)	(-2.70)
$CSR_{it-1} * SOE_{it}$		-0.453***		-0.198***
		(-3.68)		(-4.07)
$Size_{it-1}$	-0.302***	-0.272***	-0.319***	-0.277***
	(-4.99)	(-4.30)	(-5.49)	(-4.70)
$Collateral_{it-1}$	-0.127***	-0.118***	-0.113***	-0.107***
	(-4.45)	(-4.11)	(-4.16)	(-3.96)
$Solvency_{it-1}$	-0.155***	-0.144***	-0.169***	-0.158***
	(-4.22)	(-3.80)	(-4.62)	(-4.24)
$Profitability_{it-1}$	-0.143*	-0.164*	-0.180*	-0.185*
	(-1.65)	(-1.68)	(-1.80)	(-1.82)
Age_{it-1}	-0.098***	-0.097***	-0.104***	-0.099***
	(-3.85)	(-3.86)	(-3.97)	(-3.85)
$GDPgrowth_{it-1}$	-0.908***	-0.962***	-0.937***	-0.980***
	(-3.35)	(-3.49)	(-3.44)	(-3.54)
$Z-score_{it-1}$	0.039***	0.035**	0.033***	0.031**
	(3.01)	(2.63)	(2.64)	(2.42)
$HighDiversified_{it-1}$	-0.155**	-0.224*	-0.254**	-0.201*
	(-2.91)	(-1.89)	(-2.17)	(-1.68)
HHI_{it-1}	0.173***	0.234***	0.167***	0.246***
	(4.68)	(4.28)	(4.68)	(4.55)
$Sigma_{it-1}$	0.156***	0.160***	0.157***	0.157***
	(5.19)	(5.15)	(5.37)	(5.17)
Industry FE	Yes	Yes	No	No
Firm FE	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
R-square	0.511	0.522	0.413	0.419
Observations	2,164	2,209	2,164	2,209

Panel D: Rosenbaum bounds (Rb)

Rb: p-value of estimated difference at Γ	0.000
Rb: critical value of Γ(p≈0.05)	1.701
Rb: critical value of Γ(p≈0.10)	1.753

Note: This table explores the treatment effect of CSR usage on firms' probability of survival. Panel A reports the results of the following probit regression: $Pr(High\_CSR_{it} = 1) = \beta_0 + \beta_1 Size_{it-1} + \beta_2 Leverage_{it-1} + \beta_3 Collateral_{it-1} + \beta_4 Solvency_{t-1} + \beta_5 Profitability_{it-1} + \beta_6 Age_{t-1} + \beta_7 GDPgrowth_{it-1} + \beta_8 Z-score_{it-1} + HighDiversified_{it-1} + HHI_{it-1} + Sigma_{it-1} + Industry\ Fixed\ effects + Year\ fixed\ effects + \varepsilon$, where the dependent variable is $High\_CSR_{it}$. $High\_CSR_{it} = 1$ if a firm is above the median level of CSR activities in our sample and zero otherwise. Panel B compares mean statistics for our full and propensity score matching samples between High CSR firms (Treatment-$High\_CSR_{it} = 1$) and low CSR firms (Control-$High\_CSR_{it} = 0$). In Panel C, the dependent variable is a dummy variable equal to one if the firm fails and zero otherwise. Robust standard errors adjusted for heteroskedasticity are reported in parentheses. Panel D reports the cut-off values of Γ levels from the sensitivity test developed by Rosenbaum (2002). The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively. The quasi-experiment complementary panel is presented in online appendix OA.3.

Table 6: Entropy balancing diagnostic test and balanced sample regression (median)

Panel A: Entropy balancing diagnostic test						
Before Balancing						
	Treatment ($High\_CSR_{it} = 1$)			Control ($High\_CSR_{it} = 0$)		
Variables	Mean	Variance	Skewness	Mean	Variance	Skewness
SOE_{it}	0.639	0.231	-0.578	0.588	0.242	-0.358
$Size_{it-1}$	25.760	1.922	0.177	25.170	1.579	0.300
$Collateral_{it-1}$	10.010	6.307	-1.069	10.250	5.392	-0.788
$Solvency_{it-1}$	6.297	6.338	0.521	6.587	7.950	0.391
$Profitability_{it-1}$	0.496	0.193	0.757	0.458	0.205	0.737
Age_{it-1}	2.282	13.850	1.401	1.712	11.85	1.845
$GDPgrowth_{it-1}$	-0.445	0.662	-0.389	-0.424	0.620	0.194
$Z-score_{it-1}$	4.619	37.250	0.315	4.759	34.01	0.147
$HighDiversified_{it-1}$	0.455	0.248	0.180	0.412	0.242	0.358
HHI_{it-1}	0.011	0.037	33.59	0.006	0.001	17.53
$Sigma_{it-1}$	-4.252	3.195	-1.078	-4.382	3.336	-0.946
After Balancing						
	Treatment ($High\_CSR_{it} = 1$)			Control ($High\_CSR_{it} = 0$)		
SOE_{it}	0.639	0.231	-0.578	0.639	0.231	-0.578
$Size_{it-1}$	25.760	1.922	0.177	25.760	1.922	0.177
$Collateral_{it-1}$	10.010	6.307	-1.069	10.010	6.307	-1.069
$Solvency_{it-1}$	6.297	6.338	0.521	6.297	6.338	0.521
$Profitability_{it-1}$	0.496	0.193	0.757	0.496	0.193	0.757
Age_{it-1}	2.282	13.850	1.401	2.282	13.850	1.401
$GDPgrowth_{it-1}$	-0.445	0.662	-0.389	-0.445	0.662	-0.389
$Z-score_{it-1}$	4.619	37.250	0.315	4.619	37.250	0.315
$HighDiversified_{it-1}$	0.455	0.248	0.180	0.455	0.248	0.180
HHI_{it-1}	0.011	0.037	33.59	0.011	0.037	33.59
$Sigma_{it-1}$	-4.252	3.195	-1.078	-4.252	3.195	-1.078

Panel B: Weighted survival sensitivities				
	(1)	(2)	(3)	(4)
CSR_{it-1}	-0.030*	-0.030*	-0.026*	-0.041***
	(-1.93)	(-1.73)	(-1.65)	(-2.65)
SOE_{it}	-0.207**	-0.045***	-0.208**	-0.070*
	(-2.16)	(-2.72)	(-2.23)	(-1.78)
$CSR_{it-1} * SOE_{it}$		-0.203***		-0.280***
		(-2.10)		(-3.01)
$Size_{it-1}$	-0.299***	-0.256***	-0.323***	-0.273***
	(-7.04)	(-5.79)	(-7.68)	(-6.32)
$Collateral_{it-1}$	-0.053***	-0.046**	-0.049**	-0.045**
	(-2.61)	(-2.33)	(-2.50)	(-2.35)
$Solvency_{it-1}$	-0.133***	-0.124***	-0.153***	-0.143***
	(-5.50)	(-5.07)	(-6.28)	(-5.84)
$Profitability_{it-1}$	-0.198*	-0.188*	-0.205*	-0.201*
	(-1.90)	(-1.82)	(-1.92)	(-1.92)
Age_{it-1}	-0.084***	-0.077***	-0.082***	-0.075***
	(-4.17)	(-3.90)	(-4.10)	(-3.80)
$GDPgrowth_{it-1}$	-0.235***	-0.269**	-0.228**	-0.262**
	(-2.05)	(-2.43)	(-2.00)	(-2.42)
$Z-score_{it-1}$	0.025***	0.024***	0.024***	0.025***
	(2.87)	(2.74)	(2.79)	(2.79)
$HighDiversified_{it-1}$	-0.160*	-0.157*	-0.190**	-0.182*
	(-1.71)	(-1.65)	(-2.06)	(-1.94)
HHI_{it-1}	0.253***	0.375***	0.259***	0.395***
	(8.45)	(6.35)	(8.97)	(6.73)
$Sigma_{it-1}$	0.150***	0.147***	0.153***	0.149***
	(6.34)	(6.07)	(6.55)	(6.21)
Industry FE	Yes	Yes	No	No
Firm FE	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
R-square	0.203	0.483	0.233	0.246
Observations	2,426	2,410	2,426	2,410

Note: This Table reports the results using the entropy balanced method. The dependent variable is $High\_CSR_{it}$. $High\_CSR_{it} = 1$ if a firm is above median level of CSR activities in our sample and zero otherwise. Panel A compares mean statistics between the treatment group ($High\_CSR_{it} = 1$) and control group ($High\_CSR_{it} = 0$). Panel A also reports the diagnostic test to show that convergence is achieved in all three dimensions (i.e., mean, variance and skewness) following the work of Hainmueller (2012). Panel B presents the results of our main baseline regression models using the weighted sample constructed by the EB method. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

6. Robustness checks

6.1 Alternative CSR measure (Hexun score)

We first check whether our main results are robust when the Hexun CSR metric is used. The results provided in Table 7 are robust to those presented with the CSR-RKS measure. CSR and state-ownership continues to exert a negative effect on the probability of survival. The negative and statistically significant effect of $CSR^{H}_{it-1} * SOE_{it}$ remains consistent with the earlier findings. The Hexun environmental component (HXE_{it-1}) is the only one showing a negative and statistically significant coefficient, which supports the previously described channel of government intervention. HXE_{it-1} is also a level-1 subindicators for the CSR environmental performance, but it can be argued that it is more environmentally tailored compared to RKS's one. The results (Table 7, column 4), hence, alliviate any concerns regarding the true existence of the above mechanism.

6.2. The impact of financial constraints

Second, we explore how heterogeneity in the degree of financial constraints faced by firms affects the impact of CSR activities on the probability of survival of SOEs. Our results in Table 8 reaffirm our original findings. Firm survival is sensitive to changes in CSR and we observe a more negative and statistically significant effect for SOEs that are highly constrained. This confirms our argument that rising CSR activities are likely to have been a driving factor in explaining the low exit of financially constrained SOEs. The results are consistent with both proxies of financial constraints.

Table 7: Firm survival with an alternative proxy for CSR

	Baseline	SOEs	Baseline (Components)	SOEs (Components)
	(1)	(2)	(3)	(4)
CSR^{H}_{it-1}	-0.027***	-0.020***		
	(-11.41)	(-7.59)		
SOE_{it}		-0.029***	-0.303***	-0.061*
		(-9.06)	(-3.34)	(-1.83)
$CSR^{H}_{it-1} * SOE_{it}$		-0.192**		
		(-2.03)		
HXE_{it-1}			-0.269***	-0.187*
			(-2.75)	(-1.68)
HXS_{it-1}			-0.040	-0.033
			(-0.19)	(-0.23)
$HXSH_{it-1}$			0.023	-0.015
			(1.25)	(-0.21)
$HXST_{it-1}$			0.142	0.002
			(0.71)	(0.21)
HXC_{it-1}			-0.006	-0.011
			(-0.90)	(-1.08)
$HXE_{it-1} * SOE_{it}$				-0.302***
				(-3.24)
$HXS_{it-1} * SOE_{it}$				-0.021
				(-0.13)
$HXSH_{it-1} * SOE_{it}$				-0.212
				(-1.98)
$HXST_{it-1} * SOE_{it}$				-0.011
				(-0.77)
$HXC_{it-1} * SOE_{it}$				-0.212
				(-1.39)
$Size_{it-1}$	-0.268***	-0.256***	-0.250**	-0.208**
	(-6.39)	(-5.97)	(-2.53)	(-2.14)
$Collateral_{it-1}$	-0.071***	-0.070***	-0.083**	-0.133***
	(-3.54)	(-3.47)	(-2.35)	(-2.99)
$Solvency_{it-1}$	-0.131***	-0.130***	-0.135**	-0.120**
	(-5.21)	(-5.14)	(-2.36)	(-2.19)
$Profitability_{it-1}$	-0.196*	-0.212**	-0.192*	-0.195*
	(-1.84)	(-1.99)	(-1.82)	(-1.89)
Age_{it-1}	-0.090***	-0.093***	-0.111**	-0.130***
	(-4.43)	(-4.61)	(-2.43)	(-2.98)
$GDPgrowth_{it-1}$	-0.283***	-0.221**	-0.361**	-0.576***
	(-2.95)	(-2.12)	(-1.97)	(-2.95)
$Z - score_{it-1}$	0.032***	0.030***	-0.021	0.023**
	(3.65)	(3.40)	(-1.12)	(2.77)
$HighDiversified_{it-1}$	-0.194**	-0.164*	-0.178**	-0.191*
	(-1.88)	(-1.82)	(-1.97)	(-2.14)
HHI_{it-1}	0.282***	0.266***	0.259***	0.189***
	(10.19)	(9.24)	(11.44)	(7.99)
$Sigma_{it-1}$	0.185***	0.187***	0.221***	0.270***
	(8.50)	(8.55)	(3.47)	(4.21)
Observations	2322	1,986	2,106	1,829
Log likelihood	-1,072.08	-1,015.28	-490.21	-434.76
Wald (chi-square)	486.69	767.31	378.59	140.20
Pr> Wald (p-value)	0.000	0.000	0.000	0.000

Note: All specifications are estimated using the discrete Cox proportional hazards model of probability of failure. The dependent variable is a dummy equal to 1 in a given year if a firm is recorded as failed in that year and 0 otherwise. Robust z-statistics are presented in parentheses. CSR^{H}_{it-1} denotes the CSR score using the Hexun database. $HXE_{it-1}, HXS_{it-1}, HXSH_{it-1}, HXST_{it-1}, HXC_{it-1}$ are the five Hexun components. Time and industry dummies were included in all models. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table 8: CSR and financial constraints

	KZ index						WW index					
	Dummy= Financial constraints			*Dummy= (1-Financial constraints)*			*Dummy= Financial constraints*			*Dummy= (1-Financial constraints)*		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
	High	*Medium*	*Low*	*High*	*Medium*	*Low*	*High*	*Medium*	*Low*	*High*	*Medium*	*Low*
CSR_{it-1}	-0.106**	-0.052	-0.085	-0.081***	0.005	-0.045	-0.119*	-0.051	0.072	-0.078*	-0.047	-0.046
	(-1.98)	(-0.19)	(-0.12)	(-3.50)	(0.02)	(-0.17)	(-1.72)	(-1.35)	(1.39)	(-1.67)	(-1.25)	(-0.98)
SOE_{it}	-0.427***	-0.086	-0.089	-0.426***	0.528	-0.612	-0.157 **	-0.068	-0.454	-0.102**	-0.211	-0.121
	(-3.13)	(-0.47)	(-0.36)	(-3.23)	(1.34)	(-1.20)	(-2.40)	(-0.33)	(-1.28)	(-2.20)	(-0.38)	(-0.77)
$CSR_{it-1} * SOE_{it}$				-0.476***	-0.138	0.113				-0.297***	-0.050	-0.071
				(3.61)	(-0.57)	(1.30)				(-2.62)	(-0.56)	(-0.50)
$Size_{it-1}$	-0.274***	-0.289***	-0.323***	-0.236***	-0.252***	-0.390***	-0.345***	-0.428***	-0.471*	-0.312***	-0.406***	-0.472*
	(-3.75)	(-4.57)	(-3.09)	(-3.76)	(-3.47)	(-3.58)	(-7.17)	(-2.82)	(-1.76)	(-6.31)	(-2.69)	(-1.71)
$Collateral_{it-1}$	-0.060*	-0.070**	-0.091*	-0.073**	-0.066*	-0.084***	-0.079***	-0.022	-0.104	-0.072***	-0.145	-0.103
	(-1.80)	(-2.09)	(-1.72)	(-2.12)	(-1.93)	(-2.73)	(-3.26)	(-0.52)	(-1.10)	(-2.97)	(-1.23)	(-1.03)
$Solvency_{it-1}$	-0.184***	-0.181***	-0.194***	-0.180***	-0.208***	-0.022	-0.148***	-0.067	-0.107	-0.145***	-0.064	-0.145
	(-4.15)	(-4.05)	(-4.62)	(-3.98)	(-4.82)	(-0.40)	(-5.10)	(-1.34)	(-1.02)	(-4.95)	(-1.25)	(-1.23)
$Profitability_{it-1}$	-0.773***	-0.703***	-0.674***	-0.796***	-0.700***	-0.674***	-0.644**	-0.223**	-0.218**	-0.186*	-0.102	-0.106
	(-3.47)	(-2.61)	(-3.00)	(-2.90)	(-2.72)	(-3.00)	(-1.99)	(-2.01)	(-2.05)	(-1.94)	(-1.03)	(-0.83)
Age_{it-1}	-0.072*	-0.074***	-0.097*	-0.100*	-0.070***	-0.069*	-0.071***	-0.073***	-0.194**	-0.066***	-0.160*	-0.194**
	(-1.85)	(-2.78)	(-1.75)	(-1.73)	(-2.60)	(-1.76)	(-2.86)	(-3.08)	(-1.99)	(-2.81)	(-1.83)	(-1.99)
$GDPgrowth_{it-1}$	-0.220**	-0.320**	-0.448**	-0.491**	-0.326**	-0.581**	-0.263**	-0.673*	0.031	-0.251**	-0.653*	-0.116
	(-2.10)	(-2.23)	(-2.07)	(-2.26)	(-2.27)	(-2.35)	(-2.42)	(-1.79)	(1.46)	(-2.31)	(-1.71)	(-0.81)
$Z-score_{it-1}$	0.053***	0.038**	0.041***	0.049***	0.039**	0.034*	0.016*	0.006	0.034	0.022*	-0.004	0.060
	(3.66)	(2.38)	(3.04)	(3.82)	(-2.42)	(1.92)	(1.92)	(0.37)	(1.01)	(1.91)	(-0.24)	(1.62)
$HighDiversified_{it-1}$	-0.395***	-0.361*	-0.329*	-0.361*	-0.274**	-0.398***	-0.187*	-0.190*	-0.203	-0.186***	-0.060	-0.469
	(-2.82)	(-1.81)	(-1.66)	(-1.81)	(-2.09)	(-2.78)	(-1.72)	(-1.74)	(-0.57)	(-6.55)	(-0.28)	(-1.38)
HHI_{it-1}	0.038*	0.040*	0.265***	0.003***	0.044**	0.146***	0.226***	-0.152	-0.434	0.232***	1.207	0.881
	(1.92)	(2.11)	(5.42)	(5.30)	(2.18)	(4.32)	(6.36)	(-0.81)	(-1.46)	(6.48)	(0.39)	(0.32)
$Sigma_{it-1}$	0.196***	0.144***	0.096*	0.099*	0.134***	0.197***	0.164***	0.072	0.322	0.160***	0.073	0.204***
	(4.45)	(4.25)	(1.75)	(1.88)	(3.86)	(4.35)	(5.47)	(1.52)	(1.12)	(5.29)	(1.50)	(2.78)
Observations	1,169	860	397	1,141	833	394	1,801	458	167	1,757	450	203
Log likelihood	-1,242.23	-880.11	-431.95	-1,197.22	-852.69	-48.13	-1,952.19	-564.09	-154.52	-1,896.37	-558.21	-141.13
Wald (chi-square)	138.57	424.26	149.85	146.66	423.31	419.65	451.32	843.87	123.30	454.59	218.24	221.30
Pr> Wald (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: All specifications are estimated using the discrete Cox proportional hazards model of probability of failure. The dependent variable is a dummy equal to one if the firm fails and zero otherwise. The variable *Dummy* indicates in turn financially constrained firms. Columns (1) to (6) present the results using the modified Kaplan-Zingales index of Lamont *et al.* (2001) while columns (7) to (12) show the results for the Whited and Wu (2006) index for financial constraints, respectively. Firms are classified as those facing relatively high ($High$), medium ($Medium$) and low (Low) levels of financial constraints, as in Almeida *et al.* (2004). Robust z-statistics are presented in parentheses. Industry and year fixed effects are included in the models. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

6.3. The role of Chinese provinces

Furthermore, we check whether our results are affected by the provinces firms operate in, accounting for political orientation, connections between different provinces and the preferential treatment of SOEs (Deng *et al.*, 2015; Gong *et al.*, 2018). We split our firms into groups operating in provinces of high and low CSR intensity.[13] We partition the firms into two groups, namely, those of high (and low) CSR intensity. The calculation of CSR intensity is dynamic, as we allow firms to transition from the high to the low CSR-intensity pool depending on their yearly value of undertaken CSR projects. The results which are presented in Table 9 show that the impact of CSR on firms' probability of failure remains negative. The effect is only significant for firms with high CSR intensities. This implies that the firms' probability of failure is attenuated by the level of CSR intensity observed across provinces. Checking the effect of state ownership, the findings suggest that the relationship between CSR and survival prospects remains statistically significant only for SOEs that operate in high CSR intensity provinces.

Finally, we also evaluate the role of the Chinese provinces following the six group geographical classification of Park *et al.* (2006). Table 10 and 11 reaffirm our hypotheses and further highlights the role of provinces. The positive impact of CSR on survival prospects is statistically significant only for firms operating in the most financially developed regions (e.g., Guandong, Shanghai and Beijing and Tianjin). State ownership continues to play the same role in these regions as in our main results. It is notable that the highest effect is observed for SOEs in Beijing and Tianjing. Similar results are obtained for the Hexun CSR measure and are provided in the online appendix.

[13] For more information, see Table A.1

Table 9: CSR and survival prospects, accounting for state ownership and provincial CSR intensity

	Baseline		SOEs	
	High CSR intensity (1)	**Low CSR intensity (2)**	**High CSR intensity (3)**	**Low CSR intensity (4)**
CSR_{it-1}	-0.072***	-0.004	-0.077**	-0.045
	(-2.76)	(-0.18)	(-2.29)	(0.82)
SOE_{it}	-0.203**	-0.324**	-0.122**	-0.073***
	(-2.12)	(-2.36)	(-2.02)	(-2.71)
$CSR_{it-1} * SOE_{it}$			-0.277**	-0.589
			(-2.13)	(1.63)
$Size_{it}$	-0.308***	-0.324**	-0.218***	-0.259***
	(-5.15)	(-2.36)	(-3.48)	(-4.27)
$Collateral_{it-1}$	-0.131***	-0.112***	-0.124***	-0.075**
	(-5.06)	(-4.36)	(-4.69)	(-2.34)
$Solvency_{it-1}$	-0.179***	-0.057**	-0.165***	-0.083***
	(-5.30)	(-2.24)	(-4.80)	(-3.01)
$Profitability_{it-1}$	-0.256**	-0.222**	-0.248**	-0.184*
	(-1.99)	(-2.09)	(-2.03)	(-1.69)
Age_{it-1}	-0.102***	-0.065**	-0.100***	-0.061**
	(-3.47)	(-2.41)	(-3.36)	(-2.26)
$GDPgrowth_{it-1}$	-0.235**	-0.798***	-0.962***	-0.891***
	(-2.04)	(-3.46)	(-4.61)	(-4.51)
$Z - score_{it-1}$	0.045***	0.034***	0.031***	0.042***
	(3.48)	(2.63)	(2.73)	(3.17)
$HighDiversified_{it-1}$	-0.160*	-0.133	-0.148***	0.033
	(-1.71)	(-1.01)	(-3.77)	(0.82)
HHI_{it-1}	0.181***	0.177***	0.231*	0.175***
	(5.35)	(4.21)	(1.71)	(4.07)
$Sigma_{it-1}$	0.209***	0.185***	0.249***	0.198***
	(7.14)	(6.22)	(1.92)	(6.59)
Observations	1,453	973	1,423	987
Log likelihood	-1,506.25	-1,238.10	-1,3465.86	-1,193.51
Wald (chi-square)	565.48	102.99	937.28	862.37
Pr> Wald (p-value)	0.000	0.000	0.000	0.000

Note: All specifications are estimated using the discrete Cox proportional hazards model of probability of failure. The dependent variable is a dummy equal to one if the firm fails and zero otherwise. High/Low CSR intensity is a variable which splits firms into groups operating in provinces of high and low CSR intensity. To calculate this variable, we first obtain the number of CSR projects undertaken by each firm of our panel per year; and then calculate an of average of the total number of projects undertaken by firms operating within each province per year. Provinces are then ranked based on their level of CSR intensity. Robust z-statistics are presented in parentheses. Columns (1), (3), (2), and (4) refer to the results for firms assigned to the high- and low-CSR-intensity groups, respectively. Industry and year fixed effects are included in the models. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table 10: Firm survival and CSR: including Chinese provinces

	Guangdong (1)	East Coast Provinces (2)	Shanghai (3)	Beijing & Tianjin (4)	North Provinces (5)	Central & Western Provinces (6)
CSR_{it-1}	-0.094**	-0.157	-0.103**	-0.079**	-0.058	0.215
	(-2.37)	(-1.33)	(-2.53)	(-2.26)	(-1.03)	(1.64)
SOE_{it}	-0.276*	-0.942***	-0.222**	-0.399*	-0.111	0.305
	(-1.66)	(-2.85)	(-2.02)	(-1.68)	(-0.29)	(0.35)
$Size_{it-1}$	-0.532***	-0.127*	-0.200	-0.409***	-0.253**	-0.332
	(-4.54)	(-1.67)	(-1.05)	(-2.92)	(-2.37)	(-1.27)
$Collateral_{it-1}$	-0.077*	-0.176	-0.175*	-0.362**	-0.205***	-0.385***
	(-1.73)	(-0.95)	(-1.94)	(-2.37)	(-3.10)	(-2.86)
$Solvency_{it-1}$	-0.251***	-0.323*	-0.117***	-0.139*	-0.086	-0.352
	(-3.97)	(-1.86)	(-2.59)	(-1.67)	(-1.38)	(-1.56)
$Profitability_{it-1}$	-0.329**	-0.296**	-0.579**	-0.684**	-0.764***	-0.585***
	(-2.27)	(-2.08)	(-2.11)	(-2.39)	(-2.70)	(-2.73)
Age_{it-1}	-0.057	-0.119***	-0.035	-0.059	0.094	-0.080**
	(-1.51)	(-2.84)	(-1.31)	(-1.47)	(1.76)	(-2.13)
$GDPgrowth_{it-1}$	-0.077	-0.222	-0.618***	-0.281***	-0.269	0.040
	(-0.32)	(-0.71)	(-3.05)	(-3.10)	(-0.53)	(0.07)
$Z-score_{it-1}$	-0.033**	0.016	0.037**	0.024	0.015	0.065
	(-1.99)	(0.48)	(2.23)	(0.67)	(0.53)	(0.14)
$HighDiversified_{it-1}$	-0.383*	-0.031	-0.380**	-0.028	-0.016	0.866
	(-1.89)	(-0.09)	(-2.00)	(-0.08)	(-0.06)	(1.47)
HHI_{it-1}	-0.092	-0.088	0.156***	0.251***	0.384	0.256*
	(-1.35)	(-0.31)	(3.61)	(3.47)	(0.92)	(1.69)
$Sigma_{it-1}$	0.143**	0.152***	0.167***	0.144**	0.139*	0.472**
	(1.99)	(3.27)	(3.74)	(2.51)	(1.92)	(2.50)
Observations	619	314	755	217	356	165
Log pseudolikelihood	-607.93	-201.27	-790.58	-267.60	-291.21	-38.38
Wald (chi-square)	215.16	126.75	96.49	132.81	608.41	34.02
Pr> Wald (p-value)	0.000	0.000	0.000	0.000	0.000	0.000

Note: All specifications are estimated using the discrete Cox proportional hazards model of probability of failure. The dependent variable is a dummy equal to one if the firm fails and zero otherwise. Robust z-statistics are presented in parentheses. Firms are split into six groups based on the classification of Park *et al.* (2006). Industry and year fixed effects are included in the models. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level.

Table 11: Firm survival, CSR and state ownership: including Chinese provinces

	Guangdong (1)	East Coast Provinces (2)	Shanghai (3)	Beijing & Tianjin (4)	North Provinces (5)	Central & Western Provinces (6)
CSR_{it-1}	-0.057*	-0.163*	-0.079**	-0.248**	-0.056	-0.032
	(-1.67)	(-1.65)	(-2.26)	(-2.20)	(-1.00)	(-1.58)
SOE_t	-0.102**	-0.131	-0.101***	-0.219*	-0.007	-0.803
	(-2.35)	(-1.33)	(-2.91)	(-1.79)	(-0.01)	(-1.45)
$CSR_{it-1} * SOE_{it}$	-0.217*	-0.015	-0.280*	-0.389***	-0.023	-0.582
	(-1.81)	(-0.13)	(-1.67)	(-3.23)	(-0.19)	(-1.18)
$Size_{it-1}$	-0.446***	-0.159	-0.183**	-0.446***	-0.244**	-0.570**
	(-3.74)	(-0.83)	(-2.02)	(-3.13)	(-2.21)	(-2.12)
$Collateral_{it-1}$	-0.104**	-0.103	-0.121***	-0.059*	-0.203***	-0.368**
	(-2.52)	(-1.27)	(-2.78)	(-1.86)	(-3.03)	(-2.26)
$Solvency_{it-1}$	-0.265***	-0.084	-0.116***	-0.158***	-0.083	-0.490**
	(-3.83)	(-0.80)	(-2.60)	(-4.11)	(-1.33)	(-2.27)
$Profitability_{it-1}$	-0.166*	-0.183*	-0.166*	-0.174*	-0.755**	-0.161*
	(-1.65)	(-1.75)	(-1.70)	(-1.74)	(-2.61)	(-1.66)
Age_{it-1}	-0.043	-0.119***	-0.037	-0.048**	-0.093*	-0.085***
	(-1.16)	(-2.63)	(-1.34)	(-1.99)	(-1.66)	(-4.23)
$GDPgrowth_{it-1}$	-0.106	-0.374***	-0.544*	-0.302***	-0.263	-0.077
	(-0.46)	(-2.11)	(-1.95)	(-3.19)	(-0.51)	(-0.10)
$Z - score_{it-1}$	0.035***	0.003	0.037**	0.017	-0.013	-0.202***
	(2.69)	(0.10)	(2.24)	(0.47)	(-0.44)	(-3.70)
$HighDiversified_{it-1}$	-0.350*	-0.086	-0.202**	-0.104	-0.002	-0.906
	(-1.73)	(-0.24)	(-2.23)	(-0.29)	(-0.01)	(-1.58)
HHI_{it-1}	0.148***	0.300**	0.225*	0.286***	0.121*	0.461**
	(3.21)	(2.02)	(1.66)	(4.07)	(1.65)	(2.13)
$Sigma_{it-1}$	0.131***	0.162*	0.167***	0.156***	0.138*	0.299*
	(2.75)	(1.74)	(3.68)	(2.69)	(1.88)	(1.94)
Observations	583	305	761	254	378	129
Log pseudolikelihood	-571.28	-180.02	-790.02	-261.05	-286.60	-32.38
Wald (chi-square)	257.38	116.93	194.38	111.25	79.93	57.02
Pr> Wald (p-value)	0.000	0.000	0.000	0.000	0,000	0.000

Note: All specifications are estimated using the discrete Cox proportional hazards model of probability of failure. The dependent variable is a dummy equal to one if the firm fails and zero otherwise. Robust z-statistics are presented in parentheses. Firms are split into six groups based on the classification of Park *et al.* (2006). The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

6.4. Placebo tests, Covid-19, alternative policy shock and switching regression analysis

To further validate the robustness of our two hypotheses, we first conduct placebo tests for our USA-China trade war and Rule no.18 policy analysis. We find that the CSR-survival relationship is not due to cyclical trends or exogenous variation. Second, we reclassify the matched and control firms based on our alternative Hexun CSR measure for a PSM-DiD using Covid-19 as an exogenous shock. Our results remain robust under this new setup. Third, we explore a recent policy directive targeting SOEs from the Chinese government, and we find results consistent with our hypotheses. Finally, we employ an endogenous switching regression model to account for selection bias stemming from both observables and unobservable factors. The results suggest that our CSR-survival relationship holds after accounting for such bias, particularly for SOEs. The detailed explanations and empirical findings of the above are presented in the online appendix OA.7.

7. Conclusion

In this study, we explore whether CSR activities have an impact on firms' survival prospects. The literature on business failures has mainly considered the direct effect of firms' balance sheet health on their survival prospects. In this paper, we take a different perspective by examining for the first time the role of CSR activities in determining firm survival. We conduct our empirical analysis using a sample of 2,426 firm-year observations from Chinese listed firms during 2011-2019, and we employ a Cox proportional hazards model. We postulate that due to government intervention and green policy implementations in China, firms should have a higher incentive to be CSR-friendly.

Our results suggest that there is a strong positive link between CSR activities and firm survival, while this effect is stronger for SOEs. We suggest that the Chinese government's directives for firms to undertake socially responsible tasks make SOEs keener to invest in socially responsible projects. More importantly, once we split our CSR variable into its different components, we show that the environmental component is the one that drives the results. The positive effect on survival remains and is magnified for SOEs. This new finding provides evidence of the role of government intervention but also shows government support to enhance green policy measures in China. The CSR-survival relationship nexus is established also when accounting for external and internal shocks such as the USA-China trade war and Rule no.18

implementation respectively. The same applies for shocks related to Covid-19 or CSR enhancing directives targeting Chinese SOEs. Our results are robust to a battery of tests, accounting for firm-level heterogeneity, firm-location and alternative CSR measures. We apply extensive endogeneity checks, such as IV, PSM, DiD, EB, RB, while we account also for effects of the shocks through quasi-natural experiments. We also test for sample selection bias through a switching regression approach.

Overall, our findings add new evidence to the recent debate on CSR and institutional ownership. We show that CSR activities have a positive effect on firms' survival prospects in China. This is consistent with the idea that CSR can decrease transaction costs and lead to better utility of resources. We also explain that there are significant benefits in the extent to which CSR affects survival prospects for SOEs. These seem to be linked to government intervention, easier access to finance and CSR rewards enhanced through majority state ownership. As a result, government intervention can be seen as a key driver of our results and can distort the real picture of the generated CSR value, especially under the Chinese sustainability landscape.

Finally, our study is bringing forward several practical implications. First, government intervention can boost CSR integration and in parallel offer opportunities for corporate growth. Such government mechanisms are crucial for the growth of the emerging Chinese economy, especially when considering state-owned investment and capital. Second, mandatory CSR disclosure and accurate monitoring of CSR spending can lead to an improvement in the social, ethical and philanthropic firms' profile, bridging the sustainability gap between SOEs and non-SOEs. Third, it is in the interest of all Chinese listed firms to establish formal ways of measuring their CSR performance in order to navigate through the often obscure sustainability landscape.

There are several avenues for future research on this topic. Examining firm survival and CSR performance through the lens of state-ownership and political connections is one future direction. Focusing on CSR decoupling, instead of CSR performance, could be another way to explain the heterogenous CSR effects on SOEs and non-SOEs corporate failure. Finally, CEOs' compensation and competition can be of interest in a similar empirical setup.

Supporting information

Additional supporting information may be found in the online appendix.

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Appendix

Table A.1: Variables' definition and CSR project identifiers

CSR_{it}	Firm-level and yearly scores are obtained from RKS. The RKS index system was developed in three stages. We follow the recent approach (MCT 2012_1.2i version). This version refers to ISO 26,000, begins to consider industry differences, establishes the industry sub-index RKSI, and classifies the rated companies into 22 industries according to the industry classification standard of the China Securities Regulatory Commission (CSRC). The RKS system also further adjusts the design of some level-2 and level-3 indicators. For example, content sub-index RKSC is decomposed into six level-2 sub-indicators: "economic performance", "labour and human rights", "the environment", "fair operations", "consumers", and "community participation and development". Indicators such as "information on climate change mitigation and adaptation" and "information on social investment" are added to the level-2 indicators. $c_{it-1}, t_{it-1}, i_{it-1}, m_{it-1}$ are the four l components (level-1 sub-indicators) that aggregated provide the firm-level CSR score. c_{it-1} , t_{it-1}, i_{it-1} and m_{it-1} correspond to Environmental (Content), Technicality, Industry and Macrocosm, respectively.
$Size_{it}$	Logarithm of total assets
$Collateral_{it}$	Tangible assets to total assets
$Solvency_{it}$	Shareholders' fund to total assets
$Profitability_{it}$	Earnings before interest and taxes to total assets
Age_{it}	Difference between the present year and the firms' date of incorporation
$GDPgrowth_{it}$	Growth rate of the gross domestic product
$Z-score_{it}$	Sufi (2009) measures Altman's *z-score* excluding leverage, as it is a direct function of the proportion of used and unused lines of credit. The calculation is given below: $zscore = 3.3 * \frac{EBIT}{Total\ assets} + 1.0 * \frac{Sales}{Total\ assets} + 1.4 * \frac{Retained\ Earnings}{Total\ assets} + 1.2 * \frac{Working\ capital}{Total\ assets}$.
$HighDiversified_{it}$	A dummy variable which takes the value of 1 if a firm has a score of board diversity higher than the mean value of the whole sample in year t. The variable construction is based on the Blau (1977) index (gender, age and education). For more information on the construction of the variable, please see the online appendix.
HHI_{it}	It denotes the level of debt concentration in a firms' debt structure based on the the adjusted Herfindahl–Hirschman Index proposed by Colla et al. (2013). Following the work of Boubakri et al. (2021), the HHI index ranges between 0 and 1. When a firm uses all seven (only one) debt types with equal weights it has the minimum (maximum) debt concentration, and the index reaches zero (one). A firm has a low HHI when its debt structure is less concentrated and a high onewhen its debt structure is highly concentrated in one or only a few debt types.
$Sigma_{it}$	It is the firm's sigma (standard deviation of residuals from the CAPM) as a proxy for firm-specific uncertainty (Source: CSMAR).
CSR_{it}^{H}	Firm-level and yearly scores are obtained from the Hexun database. Hexun's CSR rating is based on firms' CSR report and annual financial report. It conducts a comprehensive rating towards firms' responsibility to shareholders (*HXSH*) (30%), employees (*HXST*) (15%), suppliers, customers and consumer rights (*HXC*) (15%), environmental (*HXE*) (20%) and social responsibility (*HXS*) (20%). More details for these components and a comprehensive review and comparison of RKS with Hexun is available by Cheng *et al.* (2022).
SOE_{it}	This is a dummy variable, which equals one if the firm is ultimately controlled by the central or the local governments along with their different agencies, and zero otherwise. The definitions are provided by CSMAR.
CSR firm-level project identifiers	In the CSMAR database there are firm-level project type identifiers. This is provided in the field of 'Content Type Code', and CSR projects are classified in different categories (S3301: Shareholder rights protection, S3302: Creditor rights protection, S3303: Employee rights protection, S3304: Supplier rights protection, S3305: Customer and consumer rights protection, S3306: Environment and sustainable development, S3307: Public relations and social welfare services, S3308: Social responsibility system construction and improvement, S3309: Safety production)

Online Appendix for "Corporate Social Responsibility and Firm Survival: Evidence from Chinese listed firms"

This Online Appendix contains supplementary material that is not included in the paper to conserve space and abide by the word limit of the journal.

OA. 1. Further panel and variable information

The following tables present further information on the structure of our panel. Table OA.1 presents the structure of the unbalanced panel and the yearly split of firms in high and low CSR intensity groups. Table OA.2 outlines the split of SOEs and non-SOEs across provinces.

[Insert Tables OA.1-OA.2]

Additionally, we provide some more context and information about two constructed control variables. Firstly, we focus on debt concentration. In order to control for debt concentration, we follow Colla *et al.* (2013) in constructing the adjusted Herfindahl–Hirschman Index (HHI) index. In line with the work of Boubakri *et al.* (2021), instead of focusing on traditional leverage to control for debt, we supplement our detailed firm-level data with a detailed information on the different type of firms' debt. For that, we rely on the Capital IQ database, an affiliate of Standard and Poor's, to account for the debt diversity of the firms in our database. We distinguish seven different types of debts, such as commercial paper (d_1), credit lines (d_2), term loans (d_3), senior and subordinated bonds and notes (d_4 , d_5), capital leases (d_6) and all other types as (d_7). After merging the Capital IQ database with the CSMAR database, we end up with a panel set that comprises 2,330 firm-year observations for the period between 2011-2017.

We then define:

$$SS = \sum_{\mu=1}^{7} \left(\frac{d_{\mu}}{total\ debt} \right)^2 \tag{A.1}$$

$$\text{HHI} = \frac{SS - (1/7)}{1 - (1/7)} \tag{A.2}$$

Based on the above, the normalized HHI index ranges between 0 and 1. When a firm uses all seven debt types with equal weights it has the minimum debt concentration, and the index reaches zero. At the other end, if a firm is exposed to only debt type at 100% weight in its debt structure, then the index reaches one. Specifically, a firm has a low HHI when its debt structure is less concentrated, and a high HHI when its debt structure is highly concentrated in one or only a few

deb types. Studies such as Rauh and Sufi (2010), Colla *et al.* (2013) and Boubakri *et al.* (2021) indicate that large and profitable firms rely more on borrowing from multiple sources of debt. Also, firms employing few types of debt are associated with higher bankruptcy costs.

Secondly, in terms of board diversity, we follow Blau (1977) which measures the distribution of members in a group with specific dimensions. Following previous work on board diversity (Ararat *et al.*, 2015; Cummings and Leung, 2021; Do *et al.*, 2022), we use the Blau (1977) values of gender, age and education levels as the primary indicators of a board's diversity.

These are measured as follows:

- Blau gender= Blau index value of gender diversity (gender is 1 if the board member is female, and 0 otherwise).
- Blau age= Blau index value for age diversity (age is classified into 5 categories, where 1 (age between 25-35 years old), 2 (age between 36-45 years old) 3 (age between 46-55 years old), 4 (age between 56-65 years old) and 5 (age greater than 65 years old).
- Blau edu=Blau index value for education level diversity based on the total number of years of formal education (classified into 5 categories: elementary (5 years), secondary (11 years), university (16 years), Masters (20 years), and PhD (more than 20 years).

The Blau values are first calculated for each attribute and then summed to create a composite board level diversity index based on the following formula:

$$Blau\ Index = 1 - \sum_{i=1}^{k} P_i^2 \qquad \text{(A.3)}$$

where, P_i is the proportion of the board indicator in the 'i'th category of a given attribute and k is the number of categories in a given attribute.

Once the diversity of the board is constructed in each aspect, we calculate the composite index of board diversity, i.e., diversity is equal to the total of gender, age, and education diversity. $HighDiversified_{it-1}$ ends up as a dummy variable which takes the value of 1 if a firm has a score of board diversity higher than the mean value of the whole sample in year t. Previous studies show that more diversified boards are less likely to engage in financial reporting mistakes, and therefore, less likely to engage in corporate fraud (Wahid, 2019). CSR studies also show that CSR friendly Chinese firms are less likely to engage in financial fraud (Liao *et al.*, 2019). The effect of board diversity and CSR is also investigated by Do *et al.* (2022). Their results suggest that highly diversified boards are less prone to engage in corporate fraud (and hence more likely to survive) and more likely to support CSR. Based on the above, we expect that firms with highly diversified boards have a negative association with the probability of failure.

OA.2. Average CSR growth, firm-specific characteristics per year and hazard ratios.

As a way of preliminary analysis, we plot the average yearly growth rate in CSR scores between larger and smaller SOEs and non-SOEs in Figures OA.1 and OA.2

[Insert Figures OA.1 – OA.2]

Interestingly, we observe that large SOEs consistently have higher growth rates than small SOEs and the difference is statistically significant across the period under study. The CSR growth rates of small SOEs seem to slightly converge with those of large SOEs after 2014 and more prominently after 2016. When looking the large and small non-SOEs, the first seem to have higher CSR growths overall. The difference of the growth rates is again statistically significant. Particularly, in the period 2013-2014 the large non-SOEs seems to improve much more in terms of CSR activities compared to their small counterparts. The small non-SOEs are starting to keep up with the larger ones only after 2015 and finally reach similar levels in 2016. Looking at the two figures together, SOEs have consistently higher levels of CSR growth than non-SOEs regardless of size.

We complement the above information by presenting descriptive statistics for the average CSR scores in conjunction with the average financial positions of the firms of our panel per year and ownership status. These statistics are shown in Table OA.3.

[Insert Tables OA.3]

This table provides some interesting insight about the level of CSR scores for SOEs and non-SOEs across years but also their equivalent levels of total debt, cost of debt, expenses, and profitability. SOEs are associated with yearly higher CSR scores and lower profitability but with a lower cost of debt and higher total debt on average. This is puzzling when considering the healthiness of a firm and could mean that SOEs might be privy to cheaper financing options through government intervention, a phenomenon that should be more prominent for SOEs promoting the CSR political agenda. The picture is opposite when it comes to non-SOEs.

Finally, we present the equivalent hazard ratios for Tables 2 and 3 of the main manuscript in Table OA.4 and OA.5 respectively.

[Insert Tables OA.4 – OA.5]

OA.3: Addressing Endogeneity

OA. 3.1 Difference-in-Difference (DiD) analysis using the PSM-sample

To further address issues related to endogeneity, we use two quasi-natural experiments. We apply a PSM Differences-in-Differences (PSM-DiD) on our comparable groups of treated and control firms from sub-section 4.3.1.

We first consider the trade policy uncertainty as an exogenous shock. In 2018, the Trump administration waged a trade war with China imposing tariffs on goods imported targeting imports from China. The first phase of the USA-China trade confrontation occurred on July 6, 2018 when both countries raised tariffs on each other's goods. This event caused disturbance in the global supply chain, leading to an economic policy uncertainty (Jia and Li, 2020). We argue that an exogenous shock to the CSR activities due to the trade war between China and US tests the direction of plausibility between CSR and firms' probability of survival. This trade war not only alters firms' financial performance (Jia and Li, 2020; Benguria *et al.*, 2022), but it could also influence firms' probability of survival. Hence, we exploit the possible exogenous decrease in CSR activities, resulting from enhanced import tariffs, on a DID-PSM sample to identify its impact on firms' probability of survival. Nevertheless, we expect our H1 and H2 to hold denoting that our findings are unlikely to be driven by such endogeneity concerns.

To further enhance our argument, we also consider a policy implementation by the Chinese government. In October 2013 a new regulatory rule was introduced in which all incumbent officials, including those that retired, are not permitted to keep any positions in Chinese firms (i.e., Rule no.18). This led to resignations of several individuals (i.e., ministerial senior officials, leaders of regulatory departments among others). Recent studies show that such mandatory resignations can decrease firm-level CSR performance (Li and Guo, 2022). To establish a possible causal link between CSR activities and firms' probability of survival, we introduce this directive into our design, and we expect that the negative effect of CSR activities on firms' failure to remain and to be smaller after the implementation of such policy. We test the following multivariate DiD regressions for both quasi-natural experiments:

$$h(t) = h_0(t)\exp(\beta_1 Treat_i * Post_t + \beta_2 SOE_{it} + \beta_3 Size_{it-1} + \beta_4 Collateral_{it-1} + \beta_5 Solvency_{it-1} + \beta_6 Profitability_{it-1} + \beta_7 Age_{it-1} + \beta_8 GDPgrowth_{it-1} + \beta_9 Z - score_{it-1} + \beta_{10} HighDiversified_{it-1} + \beta_{11} HHI_{it-1} + \beta_{12} Sigma_{it-1} + Industry\ dummies + Year\ dummies) \quad (A.5)$$

$$h(t) = h_0(t)\exp(\beta_1 Treat_i * Post_t + \beta_2 Treat_i * Post_t * SOE_{it} + \beta_3 Size_{it-1} + \beta_4 Collateral_{it-1} + \beta_5 Solvency_{it-1} + \beta_6 Profitability_{it-1} + \beta_7 Age_{it-1} + \beta_8 GDPgrowth_{it-1} + \beta_9 Z - score_{it-1} + \beta_{10} HighDiversified_{it-1} + \beta_{11} HHI_{it-1} + \beta_{12} Sigma_{it-1} + Industry\ dummies + Year\ dummies)$$

(A. 6)

where, $Treat_i$ takes the value of one 1 for firms which CSR activities are greater than the sample median of our matched sample (Treatment-$High\_CSR_{it} = 1$), and 0 otherwise. $Post_t$ takes the value of 1 for the post-trade-war period (2018-2019) and 0 for the pre-trade-war period (2011-2017); while it equals the value of 1 for the post-implementation of Rule no. 18 (2014-2019) and 0 for the pre-Rule no. 18 (2011-2013). $Treat_i * Post_t$, the DiD term, is the interaction between $Treat_i$ and $post_t$ while $Treat_i * Post_t * SOE_{it}$ explores the cross-sectional variation of SOEs in the treated firms relative to the control firms. $Treat_i$ and $Post_t$ dummies are omitted due to collinearity with firm and year fixed effects. We expect our main hypotheses (H1 and H2) to hold after correcting for the endogeneity problem using this DiD analysis on the PSM sample.

The results of the above approach are provided in the table below:

[Insert Table OA.6]

The above table shows that in the post-trade-war period, the coefficient on the interaction term ($Treat_i \times Post_t$) remains negative and statistically significant across all specifications among treated firms when compared to the control group. This indicates even in the uncertain trade environment imposed by the Trump administration between US and China, CSR practices continue to exert a negative effect on the likelihood of exit of Chinese firms (column 1 and 2), and especially for SOEs (column 3 and 4). Additionally, in columns 5-8 examining the implementation of Rule no. 18, we continue to observe a negative sign for the coefficient of the $Treat_i \times Post_t$ and $Treat_i \times Post_t \times SOE_{it}$,which remain significant across all specifications. The negative signs of the estimates indicate that in the post reform period of this Chinese government directive, the higher is the CSR activities the lower is the probability of failure for treated SOEs relative to the control ones.

Overall, our identification strategy shows a robust negative relationship between CSR activities and the probability of failure. Independently of the different shocks applied, CSR continues to exert a negative effect on firms' probability of failure. This suggests that the direction of causation is from CSR and not the opposite, further supporting the CSR activity's role on firms' survival prospects.

OA. 3 Endogeneity: Further robustness checks

This section discusses further issues around potential endogeneity bias. Using the PSM sample does not eliminate endogeneity concerns per se. As such, to assess the sensitivity of our results to potential hidden bias, we apply also the diagnostic test of Rosenbaum's (2002) bounds. Finally, we also apply the Entropy Balancing (EB) method developed by Hainmueller (2012), for further robustness in terms of endogeneity issues. One of the disadvantages of the PSM is the substantial loss of observations (Hossain *et al.*, 2022). EB can achieve a higher degree of covariate balance in the processed data over PSM in terms of mean, variance and skewness.

Firstly, we focus on the selection of two instrumental variables four our 2SLS regression models provided in Table 4 of the manuscript. We employ the initial level of a firm's CSR score as an instrument as this is likely to be exogenous to the contemporaneous CSR score (See, among others, Attig *et al.*, 2013; Benlemlih and Bitar, 2018; Bhandari and Javakhadze, 2017). We also make use of the local CSR score as an instrument. Previous studies highlight that CSR activities around the location of the firm has a significant effect on firms' CSR activities through knowledge spillovers and institutional pressures (Husted *et al.*, 2016; Bhandari and Javakhadze, 2017). As such, we argue that the impact of the local CSR level on firm survival is mediated via its effect on firm's CSR performance, therefore, satisfying the exclusion restriction of the instrument variable assumption.

Secondly, we focus on the PSM and EB approach. We present the equivalent of the Tables 5 and 6 in the main manuscript but by using different cut-off points for the control and treatment groups. These results are show in Tables OA.7 and OA.8.

[Insert Tables OA.7 – OA.8]

The results remain consistent with the findings in the main manuscript. Here it should be noted that on top of the 2SLS, PSM, Rb, EB and the results obtain with different cut-off points, we have also experimented with a pooled-IV linear probability model. This approach is motivated by Cornelli *et al.* (2013) and Cumming *et al.* (2017). The findings reaffirm our original findings. The results are not presented here for the sake of space and they are available upon request.

OA. 4. Survival analysis and the Cox model

In this study, we aim to explore whether and to what extent CSR activities impact the survival prospects of firms in China. To achieve the above goals, we conducted a survival analysis using the Cox proportional hazard model following (Iwasaki, 2014; Baumöhl *et al.*, 2019). The main purpose of the survival analysis is to estimate the following survival function:

$$S(t) = \Pr(T > t) = \int_0^{\infty} f(t)dt = 1 - F(t) \tag{A.7}$$

where, t represents time; T denotes the survival time; $f(t)$ refers to a density function of T; and $F(t)$ represents the cumulative distribution function of T. The survival function $S(t)$ models the probability that a firm will survive beyond time t. $S(t)$ is a monotone decreasing function of t with $S(0) = 1$ and $S(\infty) = 1$. The hazard, which means the instantaneous probability of an event occurring (firm exiting the market) time interval t to $t + \Delta t$, given that the firm has survived to t, is defined as:

$$\lim_{\Delta t \to 0} \frac{\Pr(t \leq T < t + \Delta t | T \geq t)}{\Delta t} \tag{A.8}$$

If above function can be expressed as $h(t)$, we can establish the following relationship $S(t)$ and $h(t)$:

$$S(t) = \exp\left\{-\int_0^t h(u)du\right\}, \qquad h(t) = \frac{S'(t)}{S(t)} \tag{A.9}$$

The above equations indicate that knowing the hazard function also means knowing the survival function simultaneously. The Cox proportional hazards model assumes that the hazard $h(t)$ denoting the probability of a firm exiting the market depends on time t and a set of relevant covariates x_{in}:

$$\begin{aligned} h(t|x_{in}) &= h_0(t)\exp(\beta_1 x_{i1} + \beta_2 x_{i2} + \cdots + \beta_n x_{in}) \\ &= h_0(t)\exp(\boldsymbol{\beta}^T \boldsymbol{x}_i), h_0(t) > 0 \end{aligned} \tag{A.10}$$

where β_1, β_2, …, and β_n are the parameters to be estimated, which represent the impact of the explanatory variables x_1, x_2, …, and x_n on the hazard rate. $h_0(t)$ is the baseline hazard that depends only on t and, thus, can take any form, while covariates enter the model linearly. Thus, the Cox model is a semi-parametric model that leaves its baseline hazard function unspecified. The parameters $\boldsymbol{\beta}$ of the Cox model can be estimated from the maximum likelihood estimation of the

logarithmic transformation of specification (A.4), which is represented by the following linear model:

$$\ln h(t|x_{in}) = \ln h_0\,(t) + \sum_{j=1}^{n} b_j x_{ij} \qquad \text{(A.11)}$$

OA. 5. CSR and survival: The impact of financial constraints (Hexun score)

Following the results presented in the robustness section, we replicate the results that correspond to Table 8 of the main manuscript using the Hexun scores. The results are presented in Table OA.9.

[Insert Tables OA.9]

Based on these results, financially constrained SOEs involved in CSR activities have a lower probability of exit. This is consistent with the findings of the main manuscript. Once again, it seems that highly financially constrained SOEs involved in CSR activities face a higher probability of survival for both proxies (KZ and WW). This is consistent with the notion 'too important to fail', as it is in the government's best interest for SOEs pushing the CSR agenda to not be allowed to default.

OA.6. The role of provinces (Hexun score)

The role of the Chinese provinces is also evaluated here for the Hexun score, following the same classification of Park *et al.* (2006), as in the main manuscript. The results are summarized in the following tables.

[Insert Tables OA.10-OA.11]

As with the RKS results presented in Tables OA.10 -OA.11 of the main manuscript, the positive impact of CSR on survival prospects is more prominent for firms operating in the most financially developed regions. State ownership continues to play the same role in these regions as in our main results. It is notable that the highest effect is observed for SOEs in Beijing and Tianjing.

OA.7. Placebo tests, Covid-19, alternative policy shock and switching regression analysis

OA.7.1. Placebo tests

Although our findings from the PSM-DiD in Table OA.6 suggest that CSR activities exert a negative effect on firms' probability of default, these could have been due to cyclical trends or the persistence of prior exogenous variation (Marshall *et al.*, 2022). To address this concern, we conduct two placebo tests, the findings of which are presented in the following table.

[Insert Table OA.12]

First, regarding our trade policy uncertainty, we conduct a placebo test by considering an alternative sample period, using years 2017-2019 as the false post shock period and years 2011-2016 as the pre-shock period. As such, we assume that the imposing of tariffs is into effect in 2016, which is in fact a false shock year. The results show that the coefficients of $Treat_i \times Shock_t$ and $Treat_i \times Shock_t \times SOE_{it}$ are not significant, therefore indicating that our main empirical findings are not confounded by other events. Regarding Rule no.18, we choose 2011-2013 as the pre-pseudo-event and 2014-2019 as the post-pseudo-event period ($Post_t$). To capture any past exogenous or cyclical events we assume that the Rule no. 18 implementation year is 2011, which is a false shock year. The relevant coefficients of $Treat_i \times Post_t$ and $Treat_i \times Post_t \times SOE_{it}$ are insignificant, indicating that the results presented in Table OA.6 are not confounded by other events. These placebo tests lessen any concerns regarding pre-existing trends on our dependent variable, probability of failure. From those two placebo tests, we find no indication of changes in CSR during both post shock periods, confirming the validity of our two main hypotheses.

OA.7.2 Alternative treated and control groups based on Covid-19

Next, we reclassify the matched and control firms define in sub-section 4.3 based on our alternative CSR measure, the Hexun score, and perform the previously discussed PSM-DiD analysis. We design a quasi-natural experiment focusing on the Covid-19 exogenous shock to explore the relationship between CSR activities and firms' probability of default. Recent studies show that during the pandemic firms increase their investment in CSR-oriented projects, as this decreases their systematic risk enhancing firms' value (Albuquerque *et al.*, 2019; Agoraki *et al.*, 2022).

Based on this argument, we hypothesise that Covid-19 exogenous shock should in fact, amplify the negative relationship between CSR activities and firms' probability of failure. To explore our argument, we test equations (A.5)-(A.6) and redefine our categorical variable $Post_t$ as 1 for the post-covid period (2019-2020), and 0 for the pre-covid period (2011-2020).[14] We also reclassify our dummy variable $Treat_i$ as 1 if a firm is above the 50th percentile of the distribution level of CSR-RKS in our sample, and 0 otherwise. The results of our analysis are provided in the following table.

[Insert Table OA.13]

The results of the table show that the coefficient of the interaction term remains negative and even more so for SOEs. This further supports our main hypotheses H1 and H2.

OA.7.3 CSR enhancing regulatory shock for SOEs

In order to offer additional support for our main hypothesis, we also investigate how a unique policy intervention in China affects the relationship between CSR activities and firms' probability of survival. In July 2016, the State-owned Assets Supervision and Administration Commission (SASAC) promulgated a guideline in which SOEs are advised to enhance their CSR activities, therefore promoting CSR-policy agenda of the government. As SOEs are under government

[14] Here we should note that this robustness test is possible only for the Hexun CSR measure. As explained in the main text, the RKS database offers CSR data up to 2019. After 2019, the rating company updated their CSR rating to an ESG rating. The two measurements are different and their use in the same panel is not compatible.

intervention, we explore how CSR activities changed around this reform. We re-estimate equation (A.5) for our full sample and consider that $Treat_i$ is a dummy variable that takes the value of 1 if the firm is a SOE, and 0 otherwise. $Post_t$ takes the value of 1 for the post-policy implementation period (2016-2019) and 0 for the pre-policy period (2011-2015). $Treat_i * Post_t$, the DiD term, is the interaction between $Treat_i$ and $post_t$ .The findings of this analysis are provided in the following table.

[Insert Table OA.14]

The results suggest that the CSR fulfilment policy positively affects SOEs' CSR activities. Therefore, leveraging on our identification strategy, our baseline model results suggest that such policy shock to firms' CSR activities reduces firms' probability of default.

OA.7.4 Switching regression analysis

Finally, we employ an endogenous switching regression model to account for selection bias stemming from both observables and unobservable factors. The Heckman's (1979) two-stage model is applied. We categorise CSR activities based on the year-specific median value of each firm. If the firm is above the median level of CSR activities in our sample, then a firm is considered to be CSR intensive. Our model consists of a binary outcome equation that reflects the matching between high and low CSR activity firms as well as two regression equations for the probability of default, - one for each CSR partition. Specifically, we have implemented the following model:

$$High\_CSR_i = Z_i'\beta + \varepsilon_i \qquad \text{(A.12)}$$

where, $High\_CSR_i$ is our treatment variable. It is assigned the value of 1 if the firm is above the median level of CSR activities in our sample, and 0 otherwise, Z_i' is a vector denoting our firm-specific characteristics used in our main specifications and ε_i is the error term. This model can be estimated using a Probit regression. The binary choice of CSR activities can be modelled as:

$$High\_CSR_i = 1 \ \ iff \ Z_i'\beta + \varepsilon_i > 0 \qquad \text{(A.13)}$$

and

$$High\_CSR_i = 0 \ \ iff \ Z_i'\beta + \varepsilon_i \leq 0 \qquad \text{(A.14)}$$

Under this framework our regressions with endogenous switching have the following two outcomes' equations:

$$y_{1i} = Z_i'\beta_1 + \mu_{1i} \qquad \text{(A.15)}$$

$$y_{2i} = Z_i'\beta_2 + \mu_{2i} \qquad \text{(A.16)}$$

Eq. (A.15) presents the variation in the probability of default for higher CSR activities. In turn, Eq. (A.16) presents the variation in the probability of default for lower CSR activities. Note that in practice, we observe sample respondents in only one state y_{1i} or y_{2i} . Therefore:

$$y_i = y_{1i} \ iff \ High\_CSR_i = 1 \qquad \text{(A.17)}$$

$$y_i = y_{2i} \ iff \ High\_CSR_i = 0 \qquad \text{(A.18)}$$

The endogeneity is modelled by allowing the unobserved determinants of the choice of CSR to influence the outcome variable (probability of default) in equations (A.15) and (A.16). Thus, we assume that the three error terms $(\mu_{1i}, \mu_{2i}, \varepsilon_i)$ have trivariate normal distribution with the following non-diagonal covariance matrix:

$$cov(\mu_{1i}, \mu_{2i}, \varepsilon_i) = \begin{Bmatrix} \sigma_{11} & \sigma_{12} & \sigma_{1\varepsilon} \\ \sigma_{21} & \sigma_{22} & \sigma_{2\varepsilon} \\ \sigma_{1\varepsilon} & \sigma_{2\varepsilon} & 1 \end{Bmatrix} \qquad \text{(A.19)}$$

The counterfactual outcome can be obtained as follows:

$$E[y_{2i}|\ High_{CSR} = 1\ ] = E[X_i'\beta_2 + \mu_{2i}|Z_i'\delta + \varepsilon_i > 0] = \mathrm{E}\left[X_i'\beta_2 + \mu_{2i} + \rho_{2\varepsilon}\sigma_2 \frac{\varphi(Z_i'\delta)}{\varphi(Z_i'\delta)}\right] \text{(A.20)}$$

where, $\frac{\varphi(Z_i'\delta)}{\varphi(Z_i'\delta)}$ is known as the inverse Mills ratio. In the second stage this term is incorporated into Eq (A.14) as additional regressor to account for selection bias.

In our case, we implement the same probit model defined in sub-section 4.3.2, The results of the above framework are presented in the following table, as a complementary panel to Table 5 of the main manuscript.

[Insert Table OA.15]

Our results are consistent with our main empirical findings. The term rho and sigma are positive and significant at 1% level only for $High\_CSR_{it} = 1$[15]**,** indicating a failure to reject the hypothesis of sample selection bias. The positive sign indicates a negative selection bias, suggesting that firms with above the average CSR activities have a lower probability of failure.

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[15] Our specification considers a value of 1 for the firms that are above the median level of CSR activities in our sample, and 0 otherwise. We have also experimented with a 75% cut-off point and our results remain consistent with the 50% cut-off point.

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Tables

Table OA.1: The structure of the unbalanced panel and high/low CSR intensity split

	Panel A			Panel B	
	Frequency	Percent	Cumulative	High CSR intensity firms	Low CSR intensity firms
2011	117	4.82	4.82	41	16
2012	104	4.29	9.11	38	12
2013	189	7.79	16.90	45	31
2014	134	5.52	22.42	46	29
2015	286	11.79	34.21	44	42
2016	350	14.43	48.64	48	58
2017	402	16.57	65.21	43	83
2018	408	16.82	82.03	49	46
2019	436	17.97	100.00	44	48
Total	**2,281**	**100.00**		**398**	**365**

Note: Panel A shows the number of observations, percentage, and cumulative distribution by year. Panel B presents the split of the total 763 firms into the high and low RKS CSR intensity groups per year.

Table OA.2: The number of SOEs and non-SOEs across provinces

Provinces	SOEs	Non-SOEs
Guangdong	92	87
East Coast Provinces	58	41
Shanghai	120	109
Beijing & Tianjin	53	36
North Provinces	56	43
Central & Western Provinces	32	20
Total	**411 (55.02%)**	**336 (44.98%)**

Note: The table shows the distribution of SOE and non-SOE firms across provinces, following the regional classification of Park *et al.* (2006). The total proportions of SOEs and non-SOEs are reported in the parentheses.

Table OA.3: Descriptive statistics (SOEs vs non-SOEs)

Panel A: SOEs

Years	CSR_{it} (1)	CSR^{H}_{it} (2)	Total Debt (3)	Cost of Debt (5)	Profitability (6)
2011	37.595	26.036	0.133	0.652	0.396
2012	35.996	26.803	0.124	0.489	0.322
2013	43.992	26.852	0.109	0.374	0.342
2014	41.885	27.711	0.109	0.315	0.309
2015	40.881	27.853	0.113	0.284	0.294
2016	40.444	28.212	0.100	0.095	0.292
2017	38.465	28.942	0.092	0.128	0.285
2018	38.521	28.755	0.090	0.114	0.281
2019	38.465	29.421	0.095	0.112	0.274
Average	39.583	27.843	0.107	0.285	0.310

Panel B: Non-SOEs

Years	CSR_{it} (1)	CSR^{H}_{it} (2)	Total Debt (3)	Cost of Debt (5)	Profitability (6)
2011	35.032	21.203	0.079	0.720	0.542
2012	35.982	24.032	0.074	0.512	0.584
2013	36.982	26.405	0.087	0.426	0.575
2014	37.920	28.532	0.083	0.308	0.592
2015	38.525	29.480	0.075	0.402	0.628
2016	40.552	29.553	0.073	0.587	0.604
2017	41.032	30.020	0.070	0.798	0.638
2018	37.402	27.023	0.071	0.801	0.642
2019	37.650	27.102	0.069	0.820	0.587
Average	37.897	27.010	0.076	0.597	0.599

Panel C: SOEs vs Non-SOEs

Years	Diff. CSR_{it} (1)	Diff. CSR^{H}_{it} (2)	Diff. Total Debt (3)	Diff. Cost of Debt (5)	Diff. Profitability (6)
2011	0.000**	0.000***	0.000***	0.000***	0.000***
2012	0.092**	0.000***	0.000***	0.000***	0.000***
2013	0.000**	0.013***	0.000***	0.000***	0.000***
2014	0.000**	0.005***	0.000***	0.009***	0.000***
2015	0.008**	0.000***	0.000***	0.000***	0.000***
2016	0.098***	0.000***	0.000***	0.000***	0.000***
2017	0.000***	0.000***	0.000***	0.000***	0.000***
2018	0.000***	0.000***	0.000***	0.000***	0.000***
2019	0.000***	0.000***	0.000***	0.000***	0.000***
Average	0.000***	0.000***	0.000***	0.000***	0.000***

Note: This table reports the descriptive statistics of average yearly CSR scores and the relevant financial variables for SOEs (Panel A) and non-SOEs (Panel B) for both CSR metrics, respectively. CSR_{it} and CSR^{H}_{it} indicate the CSR scores obtained from the RKS and Hexun databases, respectively. Total debt is defined as the sum of short-term debt and long-term debt divided by total assets; cost of debt is calculated as interest expenses over total assets; profitability is measured as return on assets. Panel C presents the *p*-values for the tests of equality of means across years and ownership status. For example, in Panel C the *p*-value for 2011 in Column (1) shows that the average SOE CSR score of 2011 (column (1), Panel A) is higher than the equivalent non-SOE one (column (1), Panel B) and their difference is statistically significant. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table OA.4: Hazard ratios for CSR, survival prospects and state ownership

	Hazard Ratios	
	Baseline	**SOEs**
	(1)	**(2)**
CSR_{it-1}	0.965	0.967
SOE_{it}	0.812	0.767
$CSR_{it-1} * SOE_{it}$		0.416
$Size_{it-1}$	0.724	0.738
$Collateral_{it-1}$	0.952	0.947
$Solvency_{it-1}$	0.858	0.874
$Profitability_{it-1}$	0.800	0.831
Age_{it-1}	0.922	0.918
$GDPgrowth_{it-1}$	0.796	0.794
$Z - score_{it-1}$	1.025	1.026
$HighDiversified_{it-1}$	0.827	0.841
HHI_{it-1}	1.295	1.283
$Sigma_{it-1}$	1.166	1.170

Note: This table shows the hazard ratios associated with the results of Table 2. Variables definitions are provided in Table A.1.

Table OA.5: Hazard ratios for CSR components, survival prospects and state ownership

	Hazard Ratios	
	Baseline (Components) (1)	**SOEs (Components) (2)**
c_{it-1}	0.826	0.771
t_{it-1}	0.899	0.862
i_{it-1}	0.957	0.945
m_{it-1}	0.934	0.914
SOE_{it}	0.721	0.350
$c_{it-1} * SOE_{it}$		0.815
$t_{it-1} * SOE_{it}$		1.149
$i_{it-1} * SOE_{it}$		1.001
$m_{it-1} * SOE_{it}$		1.003
$Size_{it-1}$	0.770	0.766
$Collateral_{it-1}$	0.970	0.965
$Solvency_{it-1}$	0.894	0.891
$Profitability_{it-1}$	0.829	0.787
Age_{it-1}	0.920	0.914
$GDPgrowth_{it-1}$	0.664	0.656
$Z - score_{it-1}$	1.02	1.020
$HighDiversified_{it-1}$	0.827	0.824
HHI_{it-1}	1.342	1.265
$Sigma_{it-1}$	1.162	1.164

Note: This table shows the hazard ratios associated with the results of Table 3. Variable definitions are provided in Table A.1.

Table OA.6: Difference-in-Differences regression on PSM sample

Panel E: PSM-DiD								
	Trade war				Rule no.18			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Treat_i \times Post_t$	-0.154*	-0.176**	-0.345**	-0.328**	-0.166*	-0.188**	-0.216*	-0.327**
	(-1.69)	(-1.96)	(-2.59)	(-2.44)	(-1.82)	(-2.08)	(-1.75)	(-2.44)
$Treat_i \times Post_t \times SOE_{it}$			-0.296*	-0.309*			-0.353***	-0.384***
			(-1.65)	(-1.70)			(-2.63)	(-2.95)
SOE_{it}	-0.230**	-0.221**			-0.223**	-0.218**		
	(-2.41)	(-2.37)			(-2.44)	(-2.43)		
$Size_{it-1}$	-0.329***	-0.221**	-0.360***	-0.334***	-0.217***	-0.245***	-0.221***	-0.248***
	(-7.63)	(-2.37)	(-8.56)	(-7.80)	(-5.17)	(-5.95)	(-5.26)	(-6.03)
$Collateral_{it-1}$	-0.052**	-0.356***	-0.048**	-0.051**	-0.065***	-0.063***	-0.065***	-0.063***
	(-2.57)	(-8.40)	(-2.40)	(-2.52)	(-3.75)	(-3.71)	(-3.70)	(-3.69)
$Solvency_{it-1}$	-0.140***	-0.161***	-0.164***	-0.144***	-0.115***	-0.134***	-0.117***	-0.136***
	(-5.78)	(-6.56)	(-6.68)	(-5.87)	(-4.91)	(-5.65)	(-4.97)	(-5.72)
$Profitability_{it-1}$	-0.210**	-0.192*	-0.207*	-0.195*	-0.172*	-0.185*	-0.192*	-0.186*
	(-1.97)	(-1.75)	(-1.91)	(-1.75)	(-1.66)	(-1.74)	(-1.77)	(-1.68)
Age_{it-1}	-0.087***	-0.085***	-0.087***	-0.088***	-0.096***	-0.092***	-0.096***	-0.093***
	(-4.35)	(-4.26)	(-4.33)	(-4.40)	(-4.71)	(-4.55)	(-4.74)	(-4.58)
$GDPgrowth_{it-1}$	-0.227**	-0.217*	-0.222*	-0.232***	-0.576***	-0.092***	-0.577***	-0.561***
	(-1.99)	(-1.93)	(-1.95)	(-2.02)	(-3.94)	(-4.55)	(-3.89)	(-3.93)
$Z-score_{it-1}$	0.025***	0.024***	0.024***	0.024**	0.031***	0.562***	0.031***	0.030***
	(2.86)	(2.82)	(2.81)	(2.83)	(3.55)	(3.97)	(3.52)	(3.46)
$HighDiversified_{it-1}$	-0.174*	-0.201**	-0.192**	-0.162*	-0.125	-0.030***	-0.120	-0.162*
	(-1.86)	(-2.19)	(-2.08)	(-1.73)	(-1.36)	(-3.47)	(-1.30)	(-1.73)
HHI_{it-1}	0.266***	0.272***	0.259***	0.253***	0.279***	0.150*	0.268***	0.274***
	(9.10)	(9.59)	(8.81)	(8.32)	(9.22)	(1.66)	(8.68)	(9.15)
$Sigma_{it-1}$	0.150***	0.153***	0.152***	0.150***	0.128***	0.285***	0.128***	0.128***
	(6.34)	(6.54)	(6.56)	(6.37)	(4.68)	(9.64)	(4.67)	(4.78)
Industry FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.241	0.295	0.244	0.299	0.610	0.663	0.665	0.612
Observations	2,164	2,164	2,209	2,209	2,164	2,164	2,209	2,209

Note: The table is the complementary panel E for Table 5 (main text) and shows the results for the PSM-DiD regressions as per the following specifications: $h(t) = h_0(t)\exp(\beta_1 Treat_i * Post_t + \beta_2 SOE_{it} + \beta_3 Size_{it-1} + \beta_4 Collateral_{it-1} + \beta_5 Solvency_{it-1} + \beta_6 Profitability_{it-1} + \beta_7 Age_{it-1} + \beta_8 GDPgrowth_{it-1} + \beta_9 Z-score_{it-1} + \beta_{10} HighDiversified_{it-1} + \beta_{11} HHI_{it-1} + \beta_{12} Sigma_{it-1} + Industry\ dummies + Year\ dummies)$ for Columns (1) to (2) and (5) to (6); and $h(t) = h_0(t)\exp(\beta_1 Treat_i * Post_t + \beta_2 Treat_i * Post_t * SOE_{it} + \beta_3 Size_{it-1} + \beta_4 Collateral_{it-1} + \beta_5 Solvency_{it-1} + \beta_6 Profitability_{it-1} + \beta_7 Age_{it-1} + \beta_8 GDPgrowth_{it-1} + \beta_9 Z-score_{it-1} + \beta_{10} HighDiversified_{it-1} + \beta_{11} HHI_{it-1} + \beta_{12} Sigma_{it-1} + Industry\ dummies + Year\ dummies)$ for columns (3) to (4) and (7) to (8). $Treat_i$ equals 1 for firms which CSR activities are greater than the sample median (Treatment-$High\_CSR_{it} = 1$), and 0 otherwise. $Post_t$ is an indicator variable that takes the value of 1 for the post-trade-war period (2018-2019), and 0 for the pre-trade-war period (2011-2017) in columns 1-4. $Post_t$ is also an indicator variable which assumes the value of 1 for the implementation of Rule no. 18 (2014-2019), and 0 for the pre-Rule no.18 (2011-2013) in columns 5-8. $Post_i$ and $Shock_t$ (SOE_{it}) are omitted due to collinearity with firm and year fixed effects. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table OA.7: Endogeneity – Propensity score matching approach (75%)

Panel A: High CSR

Dependent Variable	$High\_CSR_{it} = 1$
SOE_{it}	-0.121**
	(2.02)
$Size_{it-1}$	-0.366***
	(-13.14)
$Collateral_{it-1}$	-0.051***
	(-3.39)
$Solvency_{it-1}$	-0.070***
	(-4.10)
$Profitability_{it-1}$	-0.126*
	(-1.91)
Age_{it-1}	-0.028***
	(-3.53)
$GDPgrowth_{it-1}$	-0.522***
	(-3.05)
$Z-score_{it-1}$	0.013**
	(2.16)
$HighDiversified_{it-1}$	-0.093*
	(-1.65)
HHI_{it-1}	0.211***
	(8.57)
$Sigma_{it-1}$	0.072**
	(2.44)
Industry FE	Yes
Year FE	Yes
R-square	0.530
Observations	2,472

Panel B: Univariate Statistics

Full sample	Treatment	Control	Difference	t-Statistics	p-Value
SOE_{it}	0.647	0.602	0.050	2.05	0.040
$Size_{it-1}$	26.048	25.257	0.791	13.36	0.000
$Collateral_{it-1}$	9.840	10.223	-0.389	-3.56	0.000
$Solvency_{it-1}$	6.112	6.558	-0.446	-3.70	0.000
$Profitability_{it-1}$	0.498	0.470	0.028	1.39	0.163
Age_{it-1}	2.356	1.878	0.478	2.94	0.003
$GDPgrowth_{it-1}$	-0.417	-0.442	0.025	0.70	0.487
$Z-score_{it-1}$	3.954	4.959	-1.005	-3.74	0.000
$HighDiversified_{it-1}$	0.451	0.429	0.023	1.01	0.311
HHI_{it-1}	0.018	0.005	0.012	1.87	0.061
$Sigma_{it-1}$	4.213	4.352	-0.138	-1.69	0.090
Observations	1,306	1,082			
Matched sample					
SOE_{it}	0.695	0.645	0.046	1.41	0.079
$Size_{it-1}$	26.048	25.991	-0.057	-0.73	0.463
$Collateral_{it-1}$	9.840	9.694	0.147	0.89	0.283
$Solvency_{it-1}$	6.110	6.182	-0.070	-0.50	0.619
$Profitability_{it-1}$	0.450	0.451	0.054	1.94	0.053
Age_{it-1}	2.356	2.301	0.055	0.27	0.788
$GDPgrowth_{it-1}$	-0.416	-0.387	-0.029	-0.66	0.507
$Z-score_{it-1}$	3.953	3.783	0.171	0.53	0.599
$HighDiversified_{it-1}$	0.450	0.424	0.027	0.99	0.323
HHI_{it-1}	0.017	0.004	0.013	1.29	0.198
$Sigma_{it-1}$	4.214	4.084	-0.130	-1.36	0.175
Observations	1,082	1,082			

Panel C: Survival Sensitivities

	(1)	(2)	(3)	(4)
CSR_{it-1}	-0.038*	-0.042**	-0.041**	-0.053***
	(-1.83)	(-2.05)	(-2.03)	(-2.70)
SOE_{it}	-0.417***	-0.437***	-0.406***	-0.404***
	(-3.33)	(-3.52)	(-3.41)	(-3.40)
$CSR_{it-1} * SOE_{it}$		-0.067***		-0.079***
		(-3.50)		(-4.52)
$Size_{it-1}$	-0.302***	-0.272***	-0.319***	-0.277***
	(-4.99)	(-4.30)	(-5.49)	(-4.70)
$Collateral_{it-1}$	-0.127***	-0.118***	-0.113***	-0.107***
	(-4.45)	(-4.11)	(-4.16)	(-3.96)
$Solvency_{it-1}$	-0.155***	-0.144***	-0.169***	-0.158***
	(-4.22)	(-3.80)	(-4.62)	(-4.24)
$Profitability_{it-1}$	-0.250*	-0.254*	-0.281*	-0.254*
	(-1.65)	(-1.68)	(-1.81)	(-1.74)
Age_{it-1}	-0.098***	-0.097***	-0.104***	-0.099***
	(-3.35)	(-3.86)	(-3.97)	(-3.85)
$GDPgrowth_{it-1}$	-0.908***	-0.962***	-0.937***	-0.980***
	(-3.35)	(-3.49)	(-3.44)	(-3.54)
$Z-score_{it-1}$	0.039***	0.035***	0.033**	0.031**
	(3.01)	(2.63)	(2.64)	(2.42)
$HighDiversified_{it-1}$	-0.205*	-0.223*	-0.170	-0.201*
	(-1.79)	(-1.86)	(-1.45)	(-1.68)
HHI_{it-1}	0.173***	0.234***	0.167***	0.246***
	(4.68)	(4.28)	(4.68)	(4.55)
$Sigma_{it-1}$	0.156***	0.160***	0.157***	0.157***
	(5.19)	(5.15)	(5.37)	(5.17)
Industry FE	Yes	Yes	No	No
Firm FE	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
R-square	0.538	0.303	0.413	0.419
Observations	2,164	2,209	2,164	2,209

Panel D: Rosenbaum bounds (Rb)

Rb: p-value of estimated difference at Γ	0.000
Rb: critical value of Γ(p≈0.05)	1.840
Rb: critical value of Γ(p≈0.10)	1.963

Note: This table explores the treatment effect of CSR usage on firms' probability of survival. Panel A reports the results of the following probit regression: $Pr(High\_CSR_{it} = 1) = \beta_0 + \beta_1 Size_{it-1} + \beta_2 Leverage_{it-1} + \beta_3 Collateral_{it-1} + \beta_4 Solvency_{t-1} + \beta_5 Profitability_{it-1} + \beta_6 Age_{t-1} + \beta_7 GDPgrowth_{it-1} + \beta_8 Z-score_{it-1} + HighDiversified_{it-1} + HHI_{it-1} + Sigma_{it-1} + Industry\ Fixed\ effects + Year\ fixed\ effects + \varepsilon$, where the dependent variable is $High\_CSR_{it}$. $High\_CSR_{it} = 1$ if a firm is above the 75th percentile of the distribution level of CSR activities in our sample and zero otherwise. Panel B compares mean statistics for our full and propensity score matching samples between High CSR firms (Treatment-$High\_CSR_{it} = 1$) and low CSR firms (Control-$High\_CSR_{it} = 0$). In Panel C, the dependent variable is a dummy variable equal to one if the firm fails and zero otherwise. Robust standard errors adjusted for heteroskedasticity are reported in parentheses. Panel D reports the cut-off values of Γ levels from the sensitivity test developed by Rosenbaum (2002). The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table OA.8: Entropy balancing diagnostic test and balanced sample regression (75%)

Panel A: Entropy balancing diagnostic test

Before Balancing

	Treatment ($High\_CSR_{it} = 1$)			Control ($High\_CSR_{it} = 0$)		
Variables	Mean	Variance	Skewness	Mean	Variance	Skewness
SOE_{it}	0.647	0.229	-0.617	0.602	0.240	-0.418
$Size_{it-1}$	26.065	2.109	-0.017	25.260	1.576	0.278
$Collateral_{it-1}$	9.841	5.529	-0.840	10.230	5.969	-1.019
$Solvency_{it-1}$	6.112	6.013	0.579	6.558	7.500	0.413
$Profitability_{it-1}$	0.498	0.200	0.822	0.470	0.198	0.712
Age_{it-1}	2.356	13.930	1.378	1.878	12.550	1.689
$GDPgrowth_{it-1}$	-0.417	0.584	0.249	-0.442	0.663	0.234
$Z-score_{it-1}$	3.954	37.56	0.498	4.959	34.720	0.145
$HighDiversified_{it-1}$	0.451	0.248	0.197	0.428	0.245	0.290
HHI_{it-1}	0.017	0.070	24.360	0.005	0.009	19.420
$Sigma_{it-1}$	-4.214	3.331	-1.036	-4.352	3.238	-1.008

After Balancing

	Treatment ($High\_CSR_{it} = 1$)			Control ($High\_CSR_{it} = 0$)		
SOE_{it}	0.647	0.229	-0.617	0.647	0.228	-0.617
$Size_{it-1}$	26.065	2.109	-0.017	26.050	1.744	-0.004
$Collateral_{it-1}$	9.841	5.529	-0.840	9.841	8.348	-1.290
$Solvency_{it-1}$	6.112	6.013	0.579	6.112	7.030	0.538
$Profitability_{it-1}$	0.498	0.200	0.822	0.498	0.207	0.793
Age_{it-1}	2.356	13.930	1.378	2.356	14.880	1.323
$GDPgrowth_{it-1}$	-0.417	0.584	0.249	-0.417	0.635	-0.408
$Z-score_{it-1}$	3.954	37.56	0.498	3.954	35.67	0.270
$HighDiversified_{it-1}$	0.451	0.248	0.197	-0.451	0.248	0.197
HHI_{it-1}	0.017	0.070	24.360	0.017	0.009	7.879
$Sigma_{it-1}$	-4.214	3.331	-1.036	-4.214	2.980	-1.021

Note: This Table reports the results using the entropy balanced method. The dependent variable is $High\_CSR_{it}$. $High\_CSR_{it} = 1$ if a firm is above median level of CSR activities in our sample and zero otherwise. This table compares mean statistics between the treatment group ($High\_CSR_{it} = 1$) and control group ($High\_CSR_{it} = 0$). This table also reports the diagnostic test to show that convergence is achieved in all three dimensions (i.e., mean, variance and skewness) following the work of Hainmueller (2012).

Table OA.9: CSR and financial constraints

	KZ index						WW index					
	Dummy= Financial constraints			*Dummy= (1-Financial constraints)*			*Dummy= Financial constraints*			*Dummy= (1-Financial constraints)*		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
	High	*Medium*	*Low*	*High*	*Medium*	*Low*	*High*	*Medium*	*Low*	*High*	*Medium*	*Low*
CSR^{H}_{it-1}	-0.027***	-0.052	-0.003	-0.013*	-0.016	-0.013	-0.029***	-0.089	-0.017	-0.003***	-0.063	-0.018
	(-5.14)	(-1.31)	(-0.18)	(-1.81)	(0.87)	(-1.60)	(-10.21)	(-0.45)	(-1.60)	(-7.32)	(-0.32)	(-1.44)
SOE_{it}	-0.423**	-0.130	-0.159	-0.442**	-0.015	-0.087	-0.216*	-0.036	-0.016	-0.205*	-0.044	-0.013
	(2.11)	(-1.16)	(-1.41)	(-2.10)	(-1.44)	(-0.31)	(-1.91)	(-0.18)	(-1.50)	(-1.80)	(-0.21)	(-0.96)
$CSR^{H}_{it-1} * SOE_{it}$				-0.029***	-0.015	-0.010				-0.026***	-0.000	-0.002
				(-0.787)	(-1.09)	(-0.20)				(-4.09)	(-0.08)	(-0.53)
$Size_{it-1}$	-0.242***	-0.251**	-0.254**	-0.233**	-0.239***	-0.445**	-0.360***	-0.312***	-0.627***	-0.305***	-0.358***	-0.667**
	(-4.94)	(-2.30)	(-5.32)	(-2.15)	(-4.65)	(-1.99)	(-2.67)	(-6.50)	(-2.15)	(-6.24)	(-2.64)	(-2.35)
$Collateral_{it-1}$	-0.078***	-0.073***	-0.099**	-0.063**	-0.052**	-0.088*	-0.118***	-0.101***	-0.103	-0.111***	0.025	-0.111
	(-.347)	(-2.91)	(-2.01)	(-2.54)	(-2.18)	(-1.77)	(-4.96)	(-3.98)	(-1.02)	(-4.81)	(-0.68)	(-1.06)
$Solvency_{it-1}$	-0.103***	-0.205***	-0.341**	-0.328**	-0.203***	-0.106***	-0.154***	0.074	0.088	-0.157***	-0.078	-0.251**
	(-3.59)	(-2.74)	(-2.51)	(-2.36)	(-2.72)	(-3.58)	(-5.09)	(1.46)	(0.75)	(-5.06)	(-1.50)	(-2.25)
$Profitability_{it-1}$	-0.286***	-0.280**	-0.274*	-0.269*	-0.242*	-0.238*	-0.244*	-0.235**	-0.135*	-0.164*	-0.162*	-0.047*
	(-2.02)	(-1.97)	(-1.94)	(-1.88)	(-1.76)	(-1.67)	(-1.77)	(-2.44)	(-1.69)	(-1.71)	(-1.78)	(-1.72)
Age_{it-1}	-0.143***	-0.149***	-0.158*	-0.142***	-0.126***	-0.124***	-0.173*	-0.102***	-0.101***	-0.102***	-0.096***	-0.170*
	(-4.33)	(-4.45)	(-4.67)	(-4.30)	(-3.88)	(-3.87)	(-1.80)	(-3.79)	(-3.90)	(-3.94)	(-3.71)	(-1.70)
$GDPgrowth_{it-1}$	-0.744**	-0.771**	-0.823**	-0.688**	0.693**	-0.737**	-0.269*	-0.242*	-0.163	-0.358**	-0.186	-0.748***
	(-2.28)	(-2.36)	(-2.58)	(-2.08)	(-2.12)	(-2.12)	(-1.88)	(-1.76)	(-0.46)	(-2.24)	(-1.08)	(-2.16)
$Z-score_{it-1}$	0.068***	0.080***	0.018*	0.069***	0.010	-0.018	0.053*	0.009	0.030***	0.054*	-0.009	0.035***
	(3.48)	(3.28)	(1.65)	(3.49)	(0.94)	(-1.55)	(1.72)	(0.53)	(2.61)	(1.65)	(-0.50)	(2.91)
$HighDiversified_{it-1}$	-0.746*	-0.200***	-0.313*	-0.194*	-0.186*	-0.337*	-0.697*	-0.080	0.060	-0.186*	-0.093	0.272
	(-1.89)	(-1.80)	(-1.65)	(-1.75)	(-1.66)	(-1.77)	(-1.86)	(-0.41)	(0.77)	(-1.67)	(-0.47)	(0.10)
HHI_{it-1}	0.247***	0.258***	0.266***	0.160***	0.258***	0.267***	0.229***	-0.148	-0.085	0.235***	-0.093	0.061
	(7.93)	(7.75)	(8.52)	(5.39)	(7.93)	(8.09)	(7.11)	(-1.34)	(-1.02)	(7.40)	(-0.47)	(0.72)
$Sigma_{it-1}$	0.186***	0.224***	0.189***	0.159***	0.192***	0.225***	0.205***	0.132***	0.099	0.205***	0.135***	0.092
	(7.00)	(5.05)	(7.14)	(5.34)	(7.06)	(5.07)	(7.65)	(2.87)	(1.34)	(7.60)	(2.93)	(1.17)
Observations	926	611	643	754	592	640	926	611	643	754	592	640
Log likelihood	-550.14	-127.12	-58.08	-544.4	-123.70	-88.27	-1,954.16	-529.06	-138.84	-1,891.39	-523.68	-130.40
Wald (chi-square)	169.90	89.95	56.13	167.62	76.06	64.94	650.63	158.06	406.50	661.71	158.00	520.44
Pr> Wald (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: All specifications are estimated using the discrete Cox proportional hazards model of probability of failure. The dependent variable is a dummy equal to one if the firm fails and zero otherwise. CSR^{H}_{it-1} denotes the CSR score using the Hexun database. The variable *Dummy* indicates in turn financially constrained firms. Columns (1) to (6) present the results using the modified Kaplan-Zingales index of Lamont *et al.* (2001) while columns (7) to (12) show the results for the Whited and Wu (2006) index for financial constraints, respectively. Firms are classified as those facing relatively high ($High$), medium ($Medium$) and low (Low) levels of financial constraints, as in Almeida *et al.* (2004). Robust z-statistics are presented in parentheses. Industry and year fixed effects are included in the models. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table OA.10: Firm survival and Chinese provinces (Hexun score)

	Guangdong (1)	East Coast Provinces (2)	Shanghai (3)	Beijing &Tianjin (4)	North Provinces (5)	Central & Western Provinces (6)
CSR^{H}_{it-1}	-0.024***	-0.028***	-0.043***	-0.037***	-0.025	-0.012
	(-4.76)	(-6.11)	(-5.61)	(-5.12)	(-1.11)	(-0.81)
SOE_{it}	-0.743***	-0.686**	-0.711**	-0.707**	-0.077	0.283
	(-2.33)	(-2.23)	(-2.22)	(-2.17)	(-0.24)	(0.33)
$Size_{it-1}$	-0.456***	-0.145	-0.409***	-0.370**	-0.292***	-0.513*
	(-4.06)	(-0.78)	(-2.92)	(-2.47)	(-2.77)	(-1.85)
$Collateral_{it-1}$	-0.142*	-0.165*	-0.097**	-0.323**	-0.088	-0.292
	(-1.76)	(-1.83)	(-2.21)	(-2.30)	(-1.31)	(-1.28)
$Solvency_{it-1}$	-0.244***	-0.171**	-0.103**	-0.147*	-0.212***	-0.572***
	(-3.54)	(-2.06)	(-2.24)	(-1.94)	(-3.34)	(-2.62)
$Profitability_{it-1}$	-0.574**	-0.570**	-0.486*	-0.672**	-0.676**	-0.551*
	(-2.14)	(-2.05)	(-1.77)	(-2.49)	(-2.53)	(-1.91)
Age_{it-1}	-0.146***	-0.142***	-0.133***	-0.143***	-0.046	-0.066
	(-2.97)	(-3.03)	(-3.02)	(-3.05)	(-1.19)	(-1.61)
$GDPgrowth_{it-1}$	-0.136***	-0.132	-0.165	-0.529	0.341	-0.175***
	(-2.89)	(-0.78)	(-0.57)	(-1.10)	(0.92)	(-3.03)
$Z-score_{it-1}$	0.041***	-0.009	0.045***	0.040**	-0.022	0.191
	(2.78)	(-0.25)	(2.81)	(2.48)	(-0.73)	(0.25)
$HighDiversified_{it-1}$	-0.353*	-0.017	-0.219***	-0.249***	-0.092	0.271
	(-1.73)	(-0.05)	(-4.13)	(-3.45)	(0.34)	(0.47)
HHI_{it-1}	0.217***	0.128	0.146***	0.305***	0.172***	0.435***
	(2.76)	(0.40)	(2.92)	(4.12)	(3.69)	(2.82)
$Sigma_{it-1}$	0.170***	0.204***	0.190***	0.162***	0.184***	0.460***
	(3.64)	(2.81)	(4.73)	(3.29)	(2.83)	(2.85)
Observations	617	323	550	303	350	179
Log pseudolikelihood	-605.02	-193.23	-774.92	-252.54	-275.72	-39.39
Wald (chi-square)	496.59	162.83	162.77	155.46	329.83	112.59
Pr> Wald (p-value)	0.000	0.000	0.000	0.000	0.000	0.000

Note: All specifications are estimated using the discrete Cox proportional hazard model of probability of failure. The dependent variable is a dummy equal to one if the firm fails and zero otherwise. Robust z-statistics are presented in parentheses. CSR^{H}_{it-1} denotes the CSR score using the Hexun database. Firms are split into six groups based on the classification of Park *et al.* (2006). Industry and year fixed effects are included in the models. The definitions of all the variables are provided in Table A.1 of the main manuscript. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table OA.11: Firm survival, state ownership and Chinese provinces (Hexun score)

	Guangdong (1)	East Coast Provinces (2)	Shanghai (3)	Beijing & Tianjin (4)	North Provinces (5)	Central & Western Provinces (6)
CSR^{H}_{it-1}	-0.027***	-0.017***	-0.038***	-0.037***	-0.048***	-0.002
	(-4.86)	(-2.83)	(-4.08)	(-4.47)	(-3.84)	(-0.13)
SOE_{it}	-0.020***	-0.216	-0.036***	-0.023***	-0.118	-0.003
	(-2.98)	(-1.15)	(-3.62)	(-3.16)	(-0.38)	(-0.01)
$CSR^{H}_{it-1} * SOE_{it}$	-0.040***	-0.026***	-0.045***	-0.048***	0.003	-0.004
	(-3.48)	(-5.04)	(-2.77)	(3.84)	(1.45)	(-1.32)
$Size_{it-1}$	-0.463***	-0.145	-0.271*	-0.536***	-0.314***	-0.482
	(-4.11)	(-0.84)	(-1.66)	(-5.24)	(-2.97)	(-1.56)
$Collateral_{it-1}$	-0.105**	-0.014	-0.123***	-0.081**	-0.231***	-0.307*
	(-2.43)	(-2.70)	(-1.41)	(-2.16)	(-3.78)	(-1.75)
$Solvency_{it-1}$	-0.262***	-0.126***	-0.102**	-0.309***	-0.113*	-0.483**
	(-3.55)	(-2.96)	(-2.21)	(-5.18)	(-1.74)	(-2.09)
$Profitability_{it-1}$	-0.387*	-0.389*	-0.418**	-0.365*	-0.650**	-0.379*
	(-1.94)	(-1.95)	(-2.08)	(-2.98)	(-2.51)	(-1.85)
Age_{it-1}	-0.160*	-0.147***	-0.098**	-0.053	-0.024	0.017
	(-1.75)	(-3.00)	(-2.30)	(-1.31)	(-1.33)	(0.66)
$GDPgrowth_{it-1}$	-0.050**	-0.530***	-0.133**	-0.576**	0.470	0.053
	(-3.05)	(-2.62)	(-3.00)	(-2.13)	(1.22)	(0.06)
$Z-score_{it-1}$	-0.206***	-0.006	0.016	0.025	0.032	0.039**
	(-2.93)	(-0.18)	(1.26)	(0.63)	(1.11)	(2.37)
$HighDiversified_{it-1}$	-0.377*	-0.056	-0.183***	-0.087	0.064	0.403
	(-1.82)	(-0.16)	(-4.18)	(-0.26)	(0.23)	(0.61)
HHI_{it-1}	0.253***	-0.506	0.431**	0.376*	0.097	-0.134***
	(3.15)	(-1.43)	(2.20)	(1.91)	(1.29)	(3.05)
$Sigma_{it-1}$	0.169***	0.151***	0.190***	0.431**	0.159**	0.150***
	(3.64)	(3.48)	(4.73)	(2.38)	(2.34)	(3.49)
Observations	603	289	521	228	230	115
Log pseudolikelihood	-577.03	-171.38	-774.45	-246.84	-274.22	-33.55
Wald (chi-square)	458.15	847.26	163.30	156.12	170.77	27.59
Pr> Wald (p-value)	0.000	0.000	0.000	0.000	0.000	0.000

Note: All specifications are estimated using the discrete Cox proportional hazards model of probability of failure. The dependent variable is a dummy equal to one if the firm fails and zero otherwise. Robust z-statistics are presented in parentheses. CSR^{H}_{it-1} denotes the CSR score using the Hexun database. Firms are split into six groups based on the classification of Park *et al.* (2006). Industry and year fixed effects are included in the models. The definitions of all the variables are provided in Table A.3 of the main manuscript. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table OA.12:Placebo Tests

Panel E: PSM-DiD								
	Trade war				Rule no.18			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Treat_i \times Post_t$	0.137	0.101	0.189	0.162	0.020	0.119	0.113	-0.129
	(1.30)	(0.95)	(1.18)	(0.159)	(0.07)	(0.42)	(0.25)	(-0.94)
$Treat_i \times Post_t \times SOE_{it}$			-0.214	-0.248			-0.108	-0.119
			(-1.42)	(-1.63)			(-8.11)	(-0.28)
SOE_{it}	-0.215**	-0.230**			-0.242***	-0.232**		
	(-2.41)	(-2.53)			(-2.61)	(-2.55)		
$Size_{it-1}$	-0.245***	-0.212***	-0.251***	-0.218***	-0.239***	-0.267***	-0.243***	-0.271***
	(-5.93)	(-5.08)	(-6.11)	(-5.25)	(-5.79)	(-6.51)	(-5.90)	(-6.62)
$Collateral_{it-1}$	-0.058***	-0.063***	-0.058***	-0.063***	-0.021	-0.097***	-0.020	-0.042***
	(-3.19)	(-3.44)	(-3.17)	(-3.35)	(-1.12)	(-4.23)	(-1.07)	(-2.63)
$Solvency_{it-1}$	-0.130***	-0.107***	-0.134***	-0.110***	-0.097***	-0.116***	-0.100***	-0.119***
	(-5.34)	(-4.41)	(-5.45)	(-4.49)	(-4.23)	(-4.99)	(-4.30)	(-5.08)
$Profitability_{it-1}$	-0.168*	-0.169*	-0.172*	-0.170*	-0.175*	-0.183*	-0.192*	-0.181*
	(-1.67)	(-1.67)	(-1.69)	(-1.67)	(-1.65)	(-1.75)	(-1.82)	(-1.69)
Age_{it-1}	-0.091***	-0.094***	-0.093***	-0.095***	-0.089***	-0.086***	-0.090***	-0.087***
	(-4.62)	(-4.79)	(-4.69)	(-4.84)	(-4.45)	(-4.30)	(-4.47)	(-4.33)
$GDPgrowth_{it-1}$	-0.111	-0.184*	-0.117	-0.199*	-0.269***	-0.262***	-0.278***	-0.271***
	(-0.97)	(-1.66)	(-1.02)	(-1.85)	(-2.80)	(-2.79)	(-2.85)	(-2.83)
$Z-score_{it-1}$	0.023***	0.022***	0.023***	0.022**	0.019**	0.019**	0.019**	0.019**
	(2.62)	(2.57)	(2.66)	(2.54)	(2.34)	(2.28)	(2.27)	(2.24)
$HighDiversified_{it-1}$	-0.127	-0.144*	-0.137	-0.150*	-0.160*	-0.186**	-0.153*	-0.180**
	(-1.44)	(-1.65)	(-1.58)	(-1.72)	(-1.74)	(-2.05)	(-1.65)	(-1.98)
HHI_{it-1}	0.181***	0.170***	0.181***	0.169***	0.283***	0.290***	0.271***	0.279***
	(6.41)	(5.94)	(6.00)	(5.51)	(9.67)	(10.19)	(9.08)	(9.62)
$Sigma_{it-1}$	0.222***	0.223***	0.223***	0.223***	0.143***	0.145***	0.142***	0.144***
	(10.83)	(10.95)	(11.00)	(11.09)	(5.75)	(5.90)	(5.77)	(5.92)
Industry FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.702	0.758	0.709	0.764	0.506	0.452	0.510	0.455
Observations	2,164	2,164	2,209	2,209	2,164	2,164	2,209	2,209

Note: This Table reports the results from the placebo analyses using the PSM-DiD regressions as per the following specifications: $h(t) = h_0(t)\exp(\beta_1 Treat_i * Post_t + \beta_2 SOE_{it} + \beta_3 Size_{it-1} + \beta_4 Collateral_{it-1} + \beta_5 Solvency_{it-1} + \beta_6 Profitability_{it-1} + \beta_7 Age_{it-1} + \beta_8 GDPgrowth_{it-1} + \beta_9 Z-score_{it-1} + \beta_{10} HighDiversified_{it-1} + \beta_{11} HHI_{it-1} + \beta_{12} Sigma_{it-1} + Industry\ dummies + Year\ dummies)$ for columns (1) to (2) and (5) to (6); and $h(t) = h_0(t)\exp(\beta_1 Treat_i * Post_t + \beta_2 Treat_i * Post_t * SOE_{it} + \beta_3 Size_{it-1} + \beta_4 Collateral_{it-1} + \beta_5 Solvency_{it-1} + \beta_6 Profitability_{it-1} + \beta_7 Age_{it-1} + \beta_8 GDPgrowth_{it-1} + \beta_9 Z-score_{it-1} + \beta_{10} HighDiversified_{it-1} + \beta_{11} HHI_{it-1} + \beta_{12} Sigma_{it-1} + Industry\ dummies + Year\ dummies)$ for columns (3) to (4) and (7) to (8). $Treat_i$ is defined as in Table OA.6, and $Post_t$ is an indicator variable that takes the value of 1 for the post-false shock period (2017-2019), and 0 for the pre-false period (2011-2016) in columns (1) to (4). In columns (5) to (8), the post-false shock period (2014-2019), and 0 for the pre-false period (2011-2013). $Treat_i$ and $Post_t$ (SOE_{it}) are omitted due to collinearity with firm and year fixed effects. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table OA.13: Difference-in-Differences regression on PSM sample (Covid-19)

PSM- DiD: $High\_CSR_{it}^{H1} = 1$				
	(1)	(2)	(3)	(4)
$Treat_i \times Post_t$	-0.374**	-0.373***	-0.220*	-0.199*
	(-3.20)	(-3.19)	(-1.80)	(-1.65)
$Treat_i \times Post_t \times SOE_{it}$			-0.410***	-0.411***
			(-3.13)	(-3.13)
SOE_{it}	-0.406***	-0.218**		
	(-3.43)	(-2.29)		
$Size_{it-1}$	-0.335***	-0.311***	-0.340***	-0.341***
	(-5.82)	(-7.33)	(-8.13)	(-8.13)
$Collateral_{it-1}$	-0.115***	-0.053***	-0.053***	-0.053***
	(-4.29)	(-2.67)	(-2.74)	(-2.74)
$Solvency_{it-1}$	-0.174***	-0.137***	-0.159***	-0.158***
	(-4.77)	(-5.69)	(-6.60)	(-6.59)
$Profitability_{it-1}$	-0.187*	-0.195*	-0.191*	-0.201*
	(-1.82)	(-1.88)	(-1.87)	(-1.94)
Age_{it-1}	-0.105***	-0.085***	-0.083***	-0.082***
	(-4.04)	(-4.28)	(-4.20)	(-4.20)
$GDPgrowth_{it-1}$	-0.942***	-0.235**	-0.938***	-0.227*
	(-3.52)	(-2.07)	(-3.51)	(-2.05)
$Z-score_{it-1}$	0.034***	0.025***	0.022***	0.025***
	(2.73)	(2.91)	(2.87)	(2.87)
$HighDiversified_{it-1}$	-0.200*	-0.170*	-0.193*	-0.193**
	(-1.69)	(-1.82)	(-2.10)	(-2.10)
HHI_{it-1}	0.189***	0.273***	0.266***	0.266***
	(5.53)	(9.35)	(9.13)	(9.11)
$Sigma_{it-1}$	0.160***	0.152***	0.155***	0.154***
	(5.44)	(6.39)	(6.57)	(6.56)
Industry FE	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
R-square	0.418	0.291	0.243	0.244
Observations	2,134	2,134	1,944	1,944

This Table reports the results from the Propensity Matched Difference-in-Difference (PSM-DiD) regressions as per the following specifications: $h(t) = h_0(t)\exp(\beta_1 Treat_i * Shock_t + \beta_2 SOE_{it} + \beta_3 Size_{it-1} + \beta_4 Collateral_{it-1} + \beta_5 Solvency_{it-1} + \beta_6 Profitability_{it-1} + \beta_7 Age_{it-1} + \beta_8 GDPgrowth_{it-1} + \beta_9 Z - score_{it-1} + \beta_{10} HighDiversified_{it-1} + \beta_{11} HHI_{it-1} + \beta_{12} Sigma_{it-1} + Industry\ dummies + Year\ dummies)$ for columns (1) to (2) and $h(t) = h_0(t)\exp(\beta_1 Treat_i * Shock_t + \beta_2 Treat_i * Shock_t * SOE_{it} + \beta_3 Size_{it-1} + \beta_4 Collateral_{it-1} + \beta_5 Solvency_{it-1} + \beta_6 Profitability_{it-1} + \beta_7 Age_{it-1} + \beta_8 GDPgrowth_{it-1} + \beta_9 Z - score_{it-1} + \beta_{10} HighDiversified_{it-1} + \beta_{11} HHI_{it-1} + \beta_{12} Sigma_{it-1} + Industry\ dummies + Year\ dummies)$ for columns (1) (3) to (4). CSR_{it}^{H} denotes the CSR score using the Hexun database. $Treat_i$ takes the value of one 1 for firms which CSR activities are greater than the sample median (Treatment-$High\_CSR_{it}^{H1} = 1$), and 0 otherwise. $Post_t$ is an indicator variable that takes the value of 1 for the post-covid-19 period (2019-2020), and 0 for the pre-covid-19 period (2011-2017). $Treat_i$ and $Post_t$ (SOE_{it}) are omitted due to collinearity with firm and year fixed effects. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table OA.14: Difference-in-Differences regression on PSM sample (SOEs' regulatory shock)

PSM-DiD: $SOE_{it} = 1$		
	(1)	(2)
$Treat_i \times Post_t$	-0.341**	-0.326***
	(-2.56)	(-2.50)
$Size_{it-1}$	-0.124***	-0.163***
	(-2.80)	(-3.73)
$Collateral_{it-1}$	-0.035*	-0.036*
	(-1.87)	(-1.92)
$Solvency_{it-1}$	-0.064***	-0.086***
	(-2.68)	(-3.61)
$Profitability_{it-1}$	-0.150*	-0.153*
	(-1.67)	(-1.71)
Age_{it-1}	-0.090***	-0.087***
	(-4.58)	(-4.44)
$GDPgrowth_{it-1}$	-0.203*	-0.241**
	(-1.81)	(-2.38)
$Z-score_{it-1}$	0.016*	0.016*
	(1.83)	(1.84)
$HighDiversified_{it-1}$	-0.175**	-0.200**
	(-1.96)	(-2.26)
HHI_{it-1}	0.168***	0.183***
	(5.74)	(6.42)
$Sigma_{it-1}$	0.268***	0.152***
	(7.03)	(6.39)
Industry FE	No	Yes
Firm FE	Yes	Yes
Year FE	Yes	Yes
R-square	0.786	0.730
Observations	2,426	2,426

Note: This Table reports the results from the following specifications: $h(t) = h_0(t)\exp(\beta_1 Treat_i * Shock_t + \beta_2 SOE_{it} + \beta_3 Size_{it-1} + \beta_4 Collateral_{it-1} + \beta_5 Solvency_{it-1} + \beta_6 Profitability_{it-1} + \beta_7 Age_{it-1} + \beta_8 GDPgrowth_{it-1} + \beta_9 Z-score_{it-1} + \beta_{10} HighDiversified_{it-1} + \beta_{11} HHI_{it-1} + \beta_{12} Sigma_{it-1} + Industry\ dummies + Year\ dummies)$. that $Treat_i$ is a dummy variable if the firm is a SOE, and 0 otherwise. $Post_t$ takes the value of 1 for the post-policy implementation (2016-2019) and 0 for the pre-policy period (2011-2015). $Treat_i$ and $Post_t$ (SOE_{it}) are omitted due to collinearity with firm and year fixed effects. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

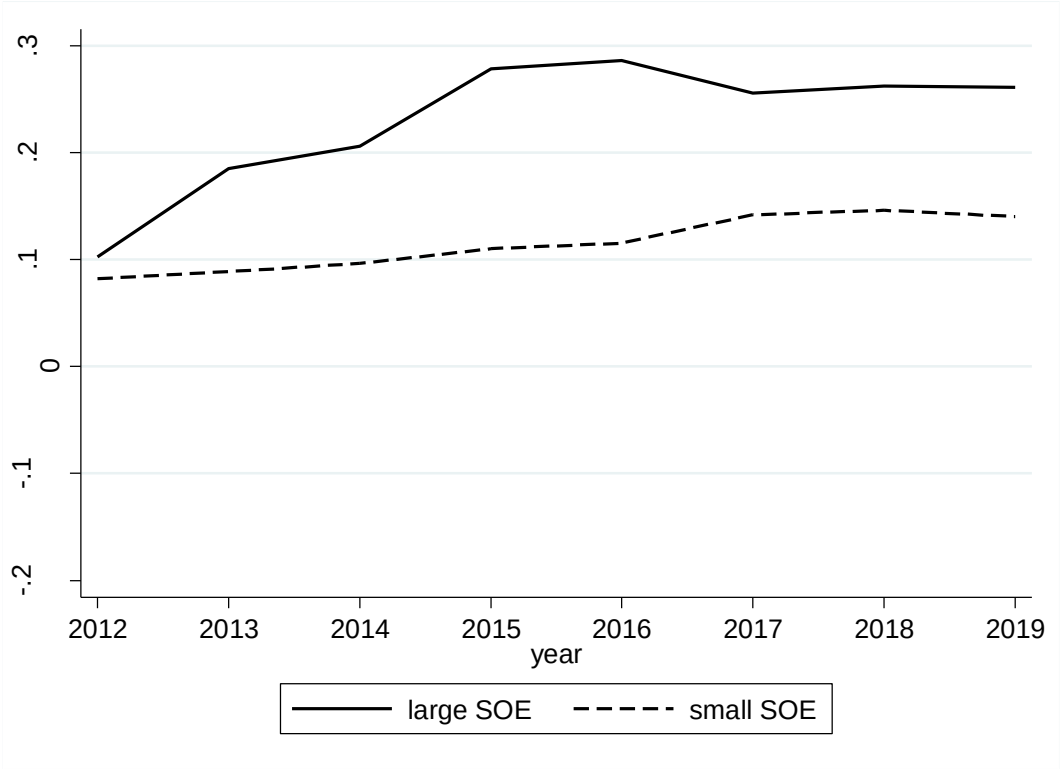
Table OA.15: Switching regression analysis

Panel A	***Pr (Failure)*** **(1)**	***Pr (Failure)*** ***(2)***
Equation	$High\_CSR_{it}$	Low_CSR_{it}
SOE_{it}	-0.202***	-0.081
	(-3.19)	(-1.47)
$Size_{it-1}$	-0.235***	-0.236***
	(-10.77)	(-10.78)
$Collateral_{it-1}$	-0.045***	-0.042***
	(-3.89)	(-3.60)
$Solvency_{it-1}$	-0.036***	-0.018
	(-2.27)	(-1.39)
$Profitability_{it-1}$	-0.094	-0.017
	(-1.54)	(-0.23)
Age_{it-1}	-0.059***	-0.030***
	(-5.40)	(-4.08)
$GDPgrowth_{it-1}$	-0.011	-0.004
	(-0.35)	(-0.11)
$Z-score_{it-1}$	0.011**	0.011***
	(1.94)	(1.85)
$HighDiversified_{it-1}$	-0.097*	-0.099*
	(-1.86)	(-1.90)
HHI_{it-1}	0.247	0.455*
	(1.13)	(1.85)
$Sigma_{it-1}$	0.032**	0.015
	(2.22)	(0.89)
Industry FE	Yes	Yes
Firm FE	Yes	Yes
Year FE	Yes	Yes
Observations	1,452	1,020
Panel B		
σ_1	0.547***	
	(0.02)	
σ_2		0.042
		(1.10)
$\rho 1_\epsilon$	0.661***	
	(0.066))	
$\rho 2_\epsilon$		-0.650
		(-0.34)

This table shows the panels of endogenous switching model of the impact of CSR activities on firms' probability of survival, complementing Table 5 (Probit selection model in which our treatment variable $High\_CSR_{it} = 1$ if a firm is above the median level of CSR activities in our sample and zero otherwise). In Panel A, Column 2 and 3 provide the variation on the probability of default for firms with higher CSR activities ($High\_CSR_{it}$) and the variation on the probability of default for firms with low CSR activities (Low_CSR_{it}), respectively. In Panel B, we report the estimates and standard errors of the Rhos and Sigmas to evaluate the impact of selection bias on our conclusion. Robust standard errors adjusted for heteroskedasticity are reported in parentheses. The definitions of all the variables are provided in Table A.1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

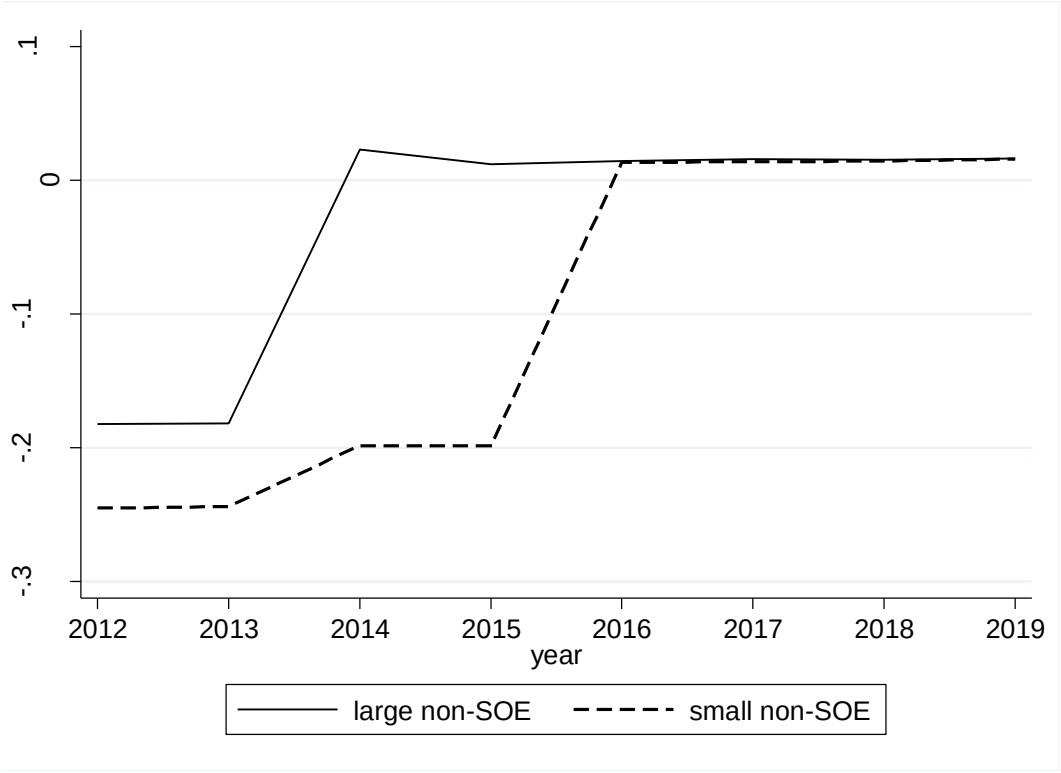
Figures

Figure OA.1: Average CSR score growth (large and small SOEs)



Note: This figure shows the yearly average CSR growth rates for large and small SOEs. Firms are considered large based on the common notation in the literature that they fall in the top 50% of the distribution of total assets. The test of equality of means between the sample of large SOEs and small SOEs is statistically significant at 5%.

Figure OA.2: Average CSR score growth (large and small non-SOEs)



Note: This figure shows the yearly average CSR growth rates for large and small non-SOEs. Firms are considered large based on the common notation in the literature that they fall in the top 50% of the distribution of total assets. The test of equality of means between the sample of large non-SOEs and small non- SOEs is statistically significant at 5%.