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Contribution to poverty alleviation: A waste or benefit for corporate financing?

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ABSTRACT

We investigate whether Chinese firms' involvements in poverty alleviation affect their costs of financing. We find causal evidence that firms' contributions to poverty alleviation result in lower cost of equity and lower cost of debt, suggesting that poverty alleviation is appreciated by both equity investors and debt investors. This result is more pronounced for non-state-owned firms, financially healthy firms, firms receiving more subsidies from local governments, and firms with larger spending in advertisements. Our mediating analyses further reveal that enhanced reputation and trust among stakeholders are the mechanisms through which corporate alleviation of poverty reduces the costs of financing.

1. Introduction

Poverty has been a long-standing challenge faced by governments around the world. It triggers a series of problems, such as hunger, diseases, and social conflicts, which adversely affect the stability and development of human society. Therefore, alleviating poverty has always been an essential goal of the United Nations for sustainable development. In 2015, the United Nations made a universal call for actions to eradicate poverty worldwide, which becomes the first primary target of the United Nations 2030 Agenda for Sustainable Development. As one of the permanent members of the United Nations Security Council, China is the largest developing country and an upper-middle-income country but has an enormous population with incomes lower than the International Poverty Line (i.e., US$ 5.50

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per day per person as per the World Bank). China still has around 200 million people living below this poverty line in 2020.[5] In addition to the large poverty population, China has long been plagued by uneven development and income inequality, exacerbating the severity of social inequality. Reducing poverty is thus of high importance to China for achieving its sustainable development goal. To this end, China has continually made a great effort to combat poverty and facilitated the rich to help the poor.

As a response to the United Nations' call for actions to end poverty, on 24 December 2015, the Chinese government held the National Conference on Development-driven Poverty Alleviation, whereby highlighting the importance of corporate participation in poverty alleviation. Following the conference, the government issued policies to call for corporate involvement in reducing poverty. For instance, in 2016, the 13th Five-Year Plan was implemented, with an objective to eliminate extreme poverty nationwide. Later in the same year, the Shanghai and Shenzhen Stock Exchanges issued notices on "improving information disclosures of poverty alleviation by listed companies," which mandated all Chinese listed firms to disclose in their annual reports the information of their contributions to poverty alleviation. These policies pressure Chinese firms into engaging in poverty alleviation. However, participating in poverty alleviation requires considerable resources, plausibly increasing a firm's financing needs. The ease or difficulty of the financing is manifested in its costs charged by investors. The objective of our study is to investigate whether and how poverty alleviation by Chinese firms affects the costs of their financing.

A firm's cost of capital represents the required rate of return by capital providers, based on their perceptions of a firm's risk and future performance. If the perceived risk is high (low) and the expected future performance is low (high), investors would be less (more) willing to provide the firm with capital, which will result in a higher (lower) cost of capital for the firm. There are both economic costs and benefits to a firm for participating in poverty alleviation, so it could have varying influences on the investors' perceptions of corporate performance and risks, and accordingly, on the firm's costs of financing.

On the one hand, engaging in poverty alleviation requires substantial resources from the firm. Conventional wisdom and theory (e.g., Friedman, 1962; Friedman, 1970) pinpoint that the priority of firm management is to maximize shareholder value. To this end, managers should allocate resources to value-enhancing business activities and distribute more dividends to shareholders. Devoting to poverty alleviation represents a plausibly inefficient capital allocation and a transfer of wealth from shareholders to third parties, resulting in fewer valuable resources being deployable for profitable investments and operations. Such plausibly inefficient utilization of resources would be more prominent in cases where poverty alleviation is done based on managers' personal charity preferences. Existing studies provide evidence that managers use corporate resources to reap social benefits and pursue self-interests (Bartkus et al., 2002; Werbel and Carter, 2002), as charity donations could enhance their reputation and social network (Masulis and Reza, 2015; Galaskiewicz, 1997) and gain higher levels of prestige, salaries, and social recognition (Campbell et al., 1999; Haley, 1991). In this regard, the firm's contribution to poverty alleviation may increase (reduce) corporate risks (performance) perceived by investors, leading to a higher cost of capital for the firm.

On the other hand, poverty alleviation displays the empathy and compassion of a firm, thereby enhancing its reputation and winning the trust of its business stakeholders. Economic theory (Klein and Leffler, 1981) views reputation and trust as important intangible assets that help a firm achieve its competitive advantages (Awang and Jusoff, 2009). Good corporate reputation facilitates a firm to obtain business support from its stakeholders (Harrison and Wicks, 2013) and helps it create investment value in several aspects. First, participation in poverty alleviation generates a favorable corporate image among customers and increases their satisfaction with the firm's products and/or services, thereby promoting its sales in the long run (Kotha et al., 2001; Nguyen and Leblanc, 2001; Roberts and Dowling, 2002). Second, allocating resources to poverty alleviation that is not directly related to core business activities can signal that the firm has abundant resources and sound financial conditions, thereby improving its creditworthiness to suppliers. As a result, they are willing to provide more trade credits to the firm, reducing its business risks (Zhang et al., 2014; Xu et al., 2020). Third, engagement in poverty alleviation showcases a firm's active response to the government's appeals in combating poverty, and thereby helps a firm build a good and stable relationship with the government. This relationship facilitates a firm to gain more resources, such as lands, preferential tax treatments, loans, and financial subsidies, from the government (Li et al., 2008; Liu et al., 2017; Chang et al., 2021). The foregoing economic benefits from participating in poverty alleviation would potentially lower business risk and boost future firm performance.

Given the economic costs and benefits associated with partaking in poverty alleviation, its impact on the cost of capital would vary substantially, depending on the investors' perceptions of corporate risks and performance that result from poverty alleviation. Thus, how corporate alleviation of poverty shapes the cost of capital is an open, empirical issue worthy of exploring. As Chinese listed firms generally prefer equity financing over debt financing in the capital raising to meet their business needs (e.g., Huang and Zhang, 2001),

[5] On 25 February 2021, the National Poverty Eradication Summary and Commendation Conference was held in Beijing. At the congress, Chinese President Jinping Xi declared that as of 2020, China had lifted all its citizens out of poverty, the line of which was set by the government to be 2,300 Chinese Yuan (CNY) per person per year (equivalent to around US$ 0.92 per person per day) based on the constant price in 2010. China has achieved great success in eradicating extreme poverty defined by itself, but not the poverty defined by the World Bank for upper-middle-income countries to which China belongs. US$ 5.50 per person per day is the International Poverty Line for upper-middle-income countries, which is applied by the World Bank until August 2022 when the poverty data were still expressed in the 2011 Purchasing Power Parity (PPP) price. In September 2022, the World Bank updated its international poverty lines based on the 2017 PPP price. Under the new price, US$ 2.15, US$ 3.65, and US$ 6.85 are the poverty lines for the low-income, lower-middle-income, and upper-middle-income countries, respectively. Based on these three new poverty lines, China had around 1.41 million, 42.3 million, and 352.5 million people living in poverty in early 2020, which account for 0.1%, 3%, and 25%, respectively, of the Chinese population. This information was obtained from the World Bank Open Data (https://data.worldbank.org/) on 25 November 2022.

we first focus on analyzing the capital charge by equity investors for the firms that pursue poverty alleviation. Though establishing good reputation via poverty alleviation may take years and the associated benefits may be realized slowly, institutional investors are still likely to perceive and value these benefits, as these investors tend to have longer investment horizons than retail investors and are more able to acquire and analyze information for assessing future firm prospect (Jiambalvo et al., 2002; Dyck et al., 2019). Indeed, prior studies find that institutional investors in developed countries are keen on social resources and often attracted by firms that engage in charity donations (e.g., Graves and Waddock, 1994; Wang et al., 2008; Zhang et al., 2016). However, China differs from developed countries in terms of economic condition, culture, institutional background, etc., which may lead to the institutional investors' different senses and views on corporate participation in poverty alleviation. Furthermore, unlike the U.S. stock market in which institutional investors contribute to the majority of stock trades (Cai and Zheng, 2004), the Chinese stock market has an enormous number of retail investors that accounts for around 70 % of the trading volume per day; there is a substantially lower number of institutional stock investments in firms (Gui and Zhu, 2021). As retail investors tend to hold short-term investment horizons and have limited attention to the information of non-core business activities, the Chinese capital market, with the dominating presence of retail investors, may not realize or value the long-run benefits, relative to the costs, of corporate participation in poverty alleviation. As it is unclear regarding the general investors' perceptions about the benefits *vis-à-vis* costs of poverty alleviation to a firm, how the poverty alleviation affects the investors' willingness to provide capital to the firm (and hence its cost of equity) warrants empirical research. If investors expect the costs of poverty alleviation to be lower (higher) than the benefits for the firm, they would be willing (unwilling) to invest in its stocks, and consequently, its cost of equity financing will be lower (higher).

Debt is another vital source of external financing for listed firms. Unlike shareholders who are eager for high abnormal returns on their investments, debtholders earn a fixed income in the form of interest, and therefore care more about the downside risk of firms (D'Aveni and Ilinitch, 1992). Poverty alleviation may take up a large amount of cash and liquid assets, plausibly increasing the default risk of a firm in the short term. Yet, partaking in poverty alleviation might enhance corporate reputation and stakeholder trust, thereby bringing more stable earnings and cash inflows to the firm in the long run. As it is unclear whether the lenders and underwriters in China put more emphasis on the long-term stable cash inflows or the near-term cash outflows, the impact of poverty alleviation on the cost of debt for firms is another empirical issue worth exploring.

Based on a sample of Chinese listed firms for the period 2016–2020, we find strong evidence that firms' contributions to poverty alleviation result in lower levels of both the cost of equity and cost of debt, implying that equity investors and debt investors are willing to provide capital with a lower price for firms that are active in contributing to poverty alleviation. The finding is robust after rigorously applying a variety of approaches, including firm-fixed-effects regressions, Oster estimates, analysis of the impact threshold for a confounding variable, two-stage instrumental-variables regressions, and difference-in-differences regressions, to control for potential endogeneity and elicit causal inferences. Our baseline result is also amenable to using alternative measures of the cost of capital and corporate contributions to poverty alleviation. We further find that poverty alleviation has a stronger mitigating effect on the cost of capital for non-state-owned firms, financially healthy firms, firms receiving more financial subsidies from local governments, and firms with larger spending in advertisements. We also find evidence to suggest that enhanced reputation and trust among stakeholders are the mechanisms through which corporate contributions to poverty alleviation reduce financing costs.

Poverty alleviation is an emerging issue concerning a myriad of earthlings. Existing studies examine poverty-related issues mainly from the perspectives of agriculture, labor, policies, and macroeconomics (e.g., Besley and Kanbur, 1988; Kanbur et al., 1994; Irz et al., 2001; Loayza and Raddatz, 2010; Zhang et al., 2019). We contribute to this literature by documenting the economic consequences to a firm for engaging in poverty alleviation. To this end, we analyze both the costs and benefits associated with corporate alleviation of poverty, and show that it is not a waste for a firm, *inter alia*, from the perspectives of investors. Our main findings inform firms of an important benefit of helping the poor – a reduction in the costs of financing from both the equity market and debt market, thereby encouraging firms to make greater contributions to poverty alleviation for their countries. In addition, our mechanism analyses imply to the firm another potential benefit of poverty alleviation: improvements in the reputation and trust among business stakeholders.

Our study also contributes to the literature on the cost of capital. A vast literature explores various information-related factors that determine the cost of equity and the cost of debt of a firm (e.g., Anderson et al., 2004; Hail and Leuz, 2006; Ogneva et al., 2007; Francis et al., 2008; Chen et al., 2009; Dhaliwal et al., 2011; Fields et al., 2012; Valta, 2012; Chiao et al., 2015). Yet, fewer studies shed light on how business activities shape the costs of financing. We fill this gap in the literature by providing causal evidence that corporate contributions to poverty alleviation lower both the cost of equity and the cost of debt.[6]

[6] Yi et al. (2020) examine the impact of Chinese firms' participation in poverty alleviation on the cost of equity. Our paper is distinguished in several important aspects from this contemporaneous paper. First, we motivate the research and frame our story from the perspective of investors' perception of the costs *vis-à-vis* benefits associated with corporate contribution to poverty alleviation. Second, we explore a different channel through which corporate alleviation of poverty affects the cost of equity. In particular, while Yi et al. (2020) analyze the mediating role of institutional investors' shareholding, we show that the firms' reputation and trust among stakeholders are the underlying mechanisms for our study. Third, we mitigate endogeneity concerns and seek the establishment of causality by using a variety of identification strategies (e.g., two-stage instrumental-variables regressions and difference-in-differences regressions) not used by Yi et al. (2020). Fourth, our cross-sectional analyses differ from Yi et al. (2020) in that we test the moderating effects of financial health, governmental subsidies, and advertising expenditures. Fifth, we also investigate the association between corporate engagements in poverty alleviation and the cost of debt. Lastly, the value of our research to global practitioners is pitched in the context of the sustainable development goal of the United Nations calling for actions to eliminate poverty worldwide. Our findings highlight to firms the potential benefits of their involvement in poverty alleviation, thereby encouraging them to make greater contributions to poverty eradication for their countries.

The rest of this paper is organized as follows. Section 2 reviews related studies on corporate social responsibility. Section 3 describes the data, variable measurements, and univariate statistics. Section 4 (Section 5) provides the multivariate analyses of the cost of equity (cost of debt). Section 6 concludes this paper.

2. Related studies on corporate social responsibility

The existing literature has documented various economic consequences of corporate social responsibility (CSR), including its impact on the firms' cost of capital, but the findings are mixed. Some studies conclude that better CSR performance leads to lower costs of capital (e.g., Sharfman and Fernando, 2008; El Ghoul et al., 2011; Goss and Roberts, 2011; Chava, 2014; Oikonomou et al., 2014; Ge and Liu, 2015; Bae et al., 2019), whereas other research has disparate conclusions. For instance, Ye and Zhang (2011) show that high CSR investments would increase the cost of debt. Harjoto and Jo (2015) distinguish between legal and normative CSR practices, and demonstrate that the latter does not affect a firm's cost of equity. Ng and Rezaee (2015) find that better social performance of a firm has no migitaging effect on its cost of equity. Breuer et al. (2018) provide evidence that better CSR performance increases the cost of capital in countries with weak investor protection. The mixed evidence on the association between CSR and cost of capital makes it an open question that warrants further investigations from different perspectives.

Unlike previous studies that examine firms' overall CSR performance, we focus on corporate responsibility to stakeholders who have little influence (i.e., the poor) on firm performance. The poverty alleviation has little bearing on the firms' main business activities, compared to other CSR activities associated with the firm's employees, suppliers, and customers. Hence, corporate alleviation of poverty may involve little motivation for profit-seeking, and can better reflects a firm's empathy and compassion towards others. The existing studies on corporate alleviation of poverty focus on examining the determinants of such philanthropic deed (e.g., Chang et al., 2021; Zhang et al., 2022) and its impact on firm value (e.g., Huang et al., 2022) or stock returns (e.g., Qiao et al., 2021). Our study adds to the strand of literature by exploring how the firms' contributions to poverty alleviation shape the costs of their financing.

3. Data and variable measurements

3.1. Data sources and sample selection

Data used for our empirical tests come mainly from four databases – WIND, Easy Professional Superior (EPS), Chinese Research Data Services (CNRDS), and China Stock Market & Accounting Research (CSMAR). Data on the cost of capital are collected from WIND. Data on the provincial GDP per capita are collected from EPS. Data on the total number of positive media news about a firm are gathered from CNRDS. Other data are taken from CSMAR. In addition, we hand-collected data on the number of impoverished counties in a city or province, which are used to construct instrumental variables for our two-stage least squares (2SLS) regression analysis.

Our sample period used for the baseline regression analysis ranges from 2016 to 2020. We use 2016 as the start year of the sample period for two reasons. First, several government plans released in 2015 (e.g., "10,000 Enterprises Help 10,000 Villages") called for corporate participation in poverty alleviation. In response to this government call, more and more Chinese-listed firms have started contributing to poverty alleviation since 2016. Second, Chinese listed firms are required by the Shanghai and Shenzhen Stock Exchanges to disclose their contributions to poverty alleviation in the 'Important Issues' section of their annual reports since 2016. Yet, before this year, it was difficult to identify the specific amount of contribution that a firm made to poverty alleviation, as corporate donations to the poor are typically mixed and conflated with other expenditures on the accounting record of the firm.

Our sample selection starts with the entire population of firms listed on the Shenzhen and Shanghai Stock Exchanges for the period 2016–2020. The initial sample consists of 18,009 firm-year observations, corresponding with 4,016 firms, and is selected in the following way for our multivariate tests. Observations of firms labeled with Special Treatment (ST or *ST) and Particular Transfer (PT) are excluded from the sample, as these firms are typically suffering from abnormal financial (or other business) conditions and faced with high delisting risk. Considering the distinct financial characteristics and business models of firms in the financial industries, we remove observations of these firms from our sample. We further eliminate observations of firms cross-listed overseas, because the cost of capital for these firms is also shaped by investors from foreign stock markets. We also tease out observations of firms with negative income and those headquartered in the autonomous prefectures of China. Finally, we exclude firm-year observations that do not have the necessary data to construct the variables of interest for our regression analysis. We ended up with 7,883 firm-year observations for 2,622 listed companies. Appendix 1 expounds the sample selection procedure. The sample period of 2016–2020 is used for all our main empirical tests, except for the difference-in-differences regression analysis which covers the period 2013–2018.

3.2. Main variables and statistics

Following previous research (e.g., Hail and Leuz, 2006; Dhaliwal et al., 2006; El Ghoul et al., 2011; Dhaliwal et al., 2016; El Ghoul et al., 2018), we measure a firm's cost of equity (namely, *r_equity_avg*) as the mean value of four proxies for the cost of equity – r_{gls}, r_{ct}, r_{oj}, and r_{mpeg}. These four variables are estimated from the models developed by Gebhardt et al. (2001), Claus and Thomas (2001), Ohlson and Juettner-Nauroth (2005), and Easton (2004), respectively. Detailed explications of these four models are provided in Appendix 2. As with prior studies (e.g., Francis et al., 2005; Jung et al., 2018; Gong et al., 2020), the cost of debt (*r_debt*) is calculated as

Table 1
Univariate statistics Panel A: Summary statistics of variables **Table B:** Correlation matrix.

Variables	N	Mean	Min.	10 %	25 %	Median	75 %	90 %	Max.	Std. dev
r_equity_avg	7,883	8.756	0.022	3.113	7.272	8.579	10.016	11.587	17.197	0.854
r_{gls}	7,883	5.126	0.000	2.261	4.033	5.262	6.471	7.470	12.397	2.052
r_{ct}	7,883	5.850	0.036	4.241	4.717	5.705	6.734	7.618	10.752	1.995
r_{oj}	7,883	13.349	0.019	5.566	10.568	12.907	15.480	18.606	32.224	4.162
r_{mpeg}	7,883	10.712	0.028	4.250	8.152	10.343	12.744	15.481	27.356	3.805
r_equity_comp	7,883	0.058	−2.045	−1.110	−0.623	−0.041	0.587	1.323	4.415	0.996
TPA	7,883	4.109	0.000	0.000	0.000	1.630	11.939	14.931	18.516	6.505
TPA_dummy	7,883	0.291	0.000	0.000	0.000	1.000	1.000	1.000	1.000	0.455
TPA_monetary	7,883	3.957	0.000	0.000	0.000	1.030	11.513	14.684	25.486	6.429
TPA_nonmonetary	7,883	1.652	0.000	0.000	0.000	0.000	0.000	10.486	21.656	4.214
Boardchair_Poverty1	2,386	0.116	0.000	0.000	0.000	0.000	0.000	0.693	2.485	0.376
Boardchair_Poverty2	2,386	0.855	0.000	0.000	0.000	0.000	2.197	3.611	4.304	1.484
Boardchair_Poverty3	2,386	6.136	4.562	5.238	5.559	6.001	6.542	7.290	9.858	0.392
Headquarter_Poverty1	7,883	0.060	0.000	0.000	0.000	0.000	0.000	0.789	2.485	0.293
Headquarter_Poverty2	7,883	0.734	0.000	0.000	0.000	0.000	1.386	2.890	4.304	1.221
Headquarter_Poverty3	7,883	10.702	7.067	9.907	10.337	10.690	11.256	11.512	11.615	0.681
reputation_news	7,883	4.279	0.693	3.135	3.611	4.143	4.828	5.656	8.989	1.047
reputation_reward	7,883	3.467	0.000	0.000	0.000	0.692	2.562	3.059	3.962	0.154
reputation_comp	7,883	0.352	−2.477	−0.759	−0.290	0.237	0.882	1.636	4.564	0.958
trade_credit	7,883	20.141	12.312	18.182	19.014	20.022	21.166	22.277	26.943	1.675
sales	7,883	22.098	16.353	20.402	21.074	21.919	22.962	24.033	28.693	1.451
subsidies	7,883	0.008	0.000	0.001	0.002	0.005	0.009	0.018	0.167	0.010
advertising	7,883	0.013	−0.003	0.000	0.000	0.002	0.007	0.031	0.594	0.035
size	7,883	22.407	19.885	21.277	21.812	22.556	23.137	23.246	26.262	0.780
soe	7,883	0.296	0.000	0.000	0.000	0.000	1.000	1.000	1.000	0.457
age	7,883	2.954	2.197	2.565	2.773	2.996	3.178	3.296	3.584	0.281
ROA	7,883	0.057	−0.373	0.009	0.025	0.050	0.083	0.120	0.231	0.053
leverage	7,883	0.428	0.057	0.176	0.281	0.423	0.568	0.681	0.918	0.189
salesgrowth	7,883	0.380	−0.678	−0.135	0.004	0.158	0.440	0.983	9.631	0.903
duality	7,883	0.276	0.000	0.000	0.000	0.000	1.000	1.000	1.000	0.447
board_indp	7883	0.376	0.111	0.127	0.296	0.364	0.429	0.429	0.571	0.054
top1_shares	7,883	0.203	0.002	0.030	0.080	0.168	0.289	0.430	0.715	0.157
operating_cash	7,883	0.059	−0.168	−0.016	0.020	0.057	0.097	0.140	0.254	0.065
cash_volatility	7,883	0.039	0.002	0.010	0.018	0.030	0.051	0.077	0.234	0.032
salaries	7,883	14.717	12.789	13.899	14.268	14.663	15.118	15.604	16.708	0.679
admin_expense	7,883	0.078	0.008	0.024	0.038	0.063	0.099	0.143	0.502	0.059
ROA_volatility	7,883	0.032	0.001	0.006	0.011	0.019	0.033	0.063	0.408	0.044
ab_accrual	7,883	−0.001	−1.945	−0.084	−0.033	0.009	0.050	0.101	0.277	0.153

Variables	*TPA*	*size*	*soe*	*age*	*ROA*	*leverage*	*salesgrowth*	*duality*	*board_indp*	*top1_shares*	*operating_cash*	*cash_volatility*	*salaries*	*admin_expense*	*ROA_volatility*	*ab_accrual*
TPA	1															
size	0.281***	1														
soe	0.059***	0.035***	1													
age	0.112***	0.126***	−0.017*	1												
ROA	0.046	0.036***	0.020**	−0.051***	1											
leverage	0.141***	0.474***	−0.008	0.135***	−0.300***	1										
salesgrowth	−0.041***	0.023***	0.013	0.032***	−0.044***	0.094***	1									
duality	−0.099***	−0.178***	−0.056***	−0.114***	0.044***	−0.102***	−0.021**	1								
board_indp	−0.004	−0.060***	−0.008	−0.034***	−0.006	−0.007	0.006	0.129***	1							
top1_shares	0.162***	0.072***	−0.007	0.033***	−0.054***	0.036***	−0.191***	−0.080***	−0.044***	1						
operating_cash	0.090***	0.049***	0.005	−0.004	0.275***	−0.172***	−0.109***	0.002	−0.004	0.236***	1					
cash_volatility	−0.079***	−0.084***	−0.030***	0.030***	−0.019**	0.078***	0.126***	0.017*	0.038***	−0.146***	−0.030***	1				
salaries	0.132***	0.398***	0.009	0.095***	0.163***	0.138***	0.003	−0.001	−0.015*	−0.109***	0.169***	−0.024***	1			
admin_expense	−0.132***	−0.330***	0.007	−0.080***	−0.125***	−0.254***	0.069***	0.062***	0.042***	−0.084***	−0.142***	−0.054***	−0.132***	1		
ROA_volatility	−0.056***	−0.104***	−0.049***	0.007	−0.275***	0.060***	−0.016*	0.019**	0.029***	−0.083***	−0.067***	0.144***	−0.020**	0.113***	1	
ab_accrual	0.048***	0.076***	0.019**	0.031***	0.132***	−0.035***	0.015*	−0.019**	0.003	−0.020**	−0.241***	0.003	0.046***	−0.086***	−0.105***	1

Notes: Panel A of Table 1 reports the descriptive statistics for all variables used in the multivariate tests of the association between poverty alleviation and the cost of equity. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. The sample period ranges from 2016 to 2020. Observations that have missing values in any of the regressors are excluded from the samples used for the multivariate tests.

Notes: Panel B of Table 1 provides the Spearman correlation coefficients for all variables involved in the baseline regression regarding the relationship between firms' contributions to poverty alleviation and the cost of equity. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

interest expenses of a firm, divided by the average of the opening balance and closing balance of the total debt, for a fiscal year. The key advantage of this measure is that it captures the overall costs of debt financing from various lenders that require different interest rates. A firm's contribution to poverty alleviation (*TPA*) is computed as the natural logarithm of the total contribution, including both monetary donations (i.e., cash donations) and non-monetary donations (i.e., in-kind donations), of the firm to the government-initiated poverty-alleviation program during a fiscal year.

Panel A of Table 1 reports the descriptive statistics of variables used in our baseline regression analysis. The mean value of *TPA*, a log-transformed variable, is 4.109, suggesting that the average amount of corporate contributions to poverty alleviation is 23,123,230 Chinese Yuan (CNY), equivalent to around US$ 3.4 million. The average cost of equity (*r_equity_avg*) amounts to 8.756 and is higher than that reported by prior research for U.S. listed companies (e.g., Rjiba et al., 2021). The average of *TPA_monetary* (*TPA_nonmonetary*) that is in the logarithmic form is 3.957 (1.652), indicating that the monetary (non-monetary) contributions of our sample firms to poverty alleviation average CNY 22,254,621 (CNY 83,187), equivalent to around US$ 3.2 million (US$ 12 thousand). Panel B of Table 1 displays the correlation metrics for the variables. The values of all the correlation coefficients are below 0.5, mitigating the concern about multicollinearity.

Table 2
Multivariate test of the association between firms' contributions to poverty alleviation and the cost of equity.

Variables	Dependent variable = $r\_equity\_avg_t$
TPA_t	−0.016***
	(−3.486)
$size_t$	0.026
	(0.530)
soe_t	0.178***
	(2.912)
age_t	−0.118
	(−1.091)
ROA_t	0.133
	(0.239)
$leverage_t$	3.183***
	(15.045)
$salesgrowth_t$	−0.138***
	(−4.380)
$duality_t$	0.215***
	(3.535)
$board\_indp_t$	0.505
	(0.995)
$top1\_shares_t$	1.229***
	(5.732)
$operating\_cash_t$	−2.729***
	(−5.717)
$cash\_volatility_t$	2.690***
	(2.940)
$salaries_t$	0.037
	(0.755)
$admin\_expense_t$	−1.898***
	(−3.673)
$ROA\_volatility_t$	0.312
	(0.480)
$ab\_accrual_t$	−0.161
	(−1.071)
intercept	6.375***
	(5.821)
Year-fixed effects	included
Industry-fixed effects	included
No. of obs.	7,883
Adj. R^2	0.229

Notes: Table 2 reports the OLS regression results for the association between firms' contributions to poverty alleviation (*TPA*) and the cost of equity (*r_equity_avg*). The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in the regression, but their results are not reported for brevity. The values of variance inflation factor (VIF) for all the independent variables are below 5. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

4. Empirical analysis of the impact of poverty alleviation on cost of equity

4.1. Baseline regression analyses

To test whether the cost of equity of a firm is positively or negatively associated with its contributions to poverty alleviation, we estimate the following ordinary least squares (OLS) regression model:

$$\begin{aligned} r\_equity\_avg_t = {} & \alpha_0 + \alpha_1 TPA_t + \alpha_2 size_t + \alpha_3 soe_t + \alpha_4 age_t + \alpha_5 ROA_t + \alpha_6 leverage_t + \alpha_7 salesgrowth_t + \alpha_8 duality_t \\ & + \alpha_9 board\_indp_t + \alpha_{10} top1\_shares_t + \alpha_{11} operating\_cash_t + \alpha_{12} cash\_volatility_t + \alpha_{13} salaries_t \\ & + \alpha_{14} admin\_expense_t + \alpha_{15} ROA\_volatility_t + \alpha_{16} ab\_accrual_t + year\_dummies + industry\_dummies + \varepsilon_t \end{aligned} \quad (1)$$

where the dependent variable is the cost of equity (*r_equity_avg*); the key independent variable is corporate contributions to poverty alleviation (*TPA*). If contributions to poverty alleviation result in a lower (higher) cost of equity for firms, the coefficient on *TPA* should be negative (positive) and statistically significant at a conventional level. Following previous studies (Eisenberg et al., 1998; Minton and Schrand, 1999; Chen et al., 2011a, 2011b; Bhattacharya et al., 2012; Cao et al., 2015; Goh et al., 2016), we control for the following variables in the regression: firm size (*size*), state-owned property (*soe*), firm age (*age*), return on assets (*ROA*), financial leverage (*leverage*), sales growth (*salesgrowth*), CEO-chairman/chairwoman duality (*duality*), board independence (*board_indp*), the largest shareholder's stock holdings (*top1_shares*), financial health (*operating_cash*), cash flow volatility (*cash_volatility*), senior executives' compensation (*salaries*), administrative expenses (*admin_expense*), the volatility of returns on assets (*ROA_volatility*), and abnormal accruals (*ab_accrual*), all of which are defined in Appendix 3. Year and industry dummies are also included in the regression, as per prior studies (e.g., Gebhardt et al., 2001; Dhaliwal et al., 2006; Chen et al., 2011a, 2011b; Guindy, 2021).

Table 2 displays the OLS regression results. The coefficient on *TPA* is negative and statistically significant at the 1 % level, suggesting that firms with greater contributions to poverty alleviation enjoy the lower cost of equity. The point estimate on *TPA* is −0.016, indicating that a one-standard-deviation increase in *TPA* is associated with a decrease of 0.104 in *r_equity_avg*, which accounts for 12.19 % of the one-standard-deviation of *r_equity_avg* for the full sample and is economically significant. The values of variance inflation factors for all regressors are below 5, so our regression results should be free from multicollinearity issues.

4.2. Control for Correlated-Omitted-Variable(s) bias

Although we control for a broad set of variables alongside industry- and year-fixed effects in our regression, it is still plausible that our baseline results are biased by potentially correlated omitted variable(s). To assuage this concern, we do a firm-fixed-effects regression analysis, analyze the impact threshold for a confounding variable, and perform the Oster (2019) test for coefficient stability, respectively, in the following three subsections.

4.2.1. Control for Firm-Fixed effects

We apply firm-fixed-effects regression to Model (1) and report the results in Table WA1 in Web Appendix A. The coefficient on *TPA* is negative and statistically significant at the 5 % level for the univariate (multivariate) regression where the control variables are excluded (included). A one-standard-deviation increase in *TPA* is associated with a decrease of 0.059 (0.052) in *r_equity_avg*, which accounts for 6.86 % (6.09 %) of the one-standard-deviation of *r_equity_avg* for the full sample in the univariate (multivariate) regression and is economically significant. From these results, we may infer that the higher degree to which a firm contributes to poverty alleviation, the lower the cost of equity capital would be for the firm.

4.2.2. The impact threshold for a confounding variable

To further diminish the concern over potentially correlated omitted variable(s), we follow previous research (Frank, 2000; Larcker and Rusticus, 2010) to analyze the impact threshold for a confounding variable (ITCV) for our baseline regression results. The ITCV analysis identifies a cut-off point for the impact of omitted variable(s), beyond which the regression results would be biased if the omitted variable(s) were included in the regression. Provided that the ITCV value is larger than the impact factors of a range of determinant variables included in the regression, the regression results are unlikely to be biased by correlated omitted variable(s), even if they exist. Table WA2 in Web Appendix A shows the results of the ITCV tests. The estimated absolute value of ITCV is 0.0176 and is higher than any absolute value of the impact factor (*impact*) of variables that are included in Model (1). Therefore, we may rest assured that our baseline regression results are reasonably immune from potential correlated-omitted-variable(s) bias.

4.2.3. Oster identifiable sets

We also use the Oster (2019) identifiable sets to check the robustness of our baseline results to the potential omitted variable(s). Oster (2019) constructs the identifiable sets using the coefficients of the key independent variable and R-squares from the regressions with and without control variables. If zero is not present in the identifiable sets, the baseline regression results would be free from the omitted-variable(s) bias. Table WA3 in Web Appendix A presents the results of the Oster-identified sets under five conditions, in which five R_{max} derived from five different hypothetical regressions are used respectively, along with δ set as one, to estimate the bounds of

the identified sets.[7] None of our identified sets, which cover the ranges [−0.0519, −0.0460], [−0.0659, −0.0460], [−0.0859, −0.0460], [−0.1069, −0.0460], and [−0.1169, −0.0460], includes zero. Therefore, it is unlikely that the inferences drawn from our baseline regression would be altered by accounting for potential omitted variable(s).

4.3. Establishment of causality

Reverse causality is another endogeneity that plausibly plagues our baseline regression analysis. Firms with a higher cost of equity might have the incentive to contribute more to poverty alleviation, with an aim to gain investor recognition for their active engagement in the national campaign and thereby lower their cost of equity. As such, the cost of equity would have a reverse, positive correlation with firms' contributions to poverty alleviation. However, our baseline results indicate an opposite, negative relationship and thus are unlikely to be explained alternatively by this reverse causality. That said, it is also possible that firms with a higher cost of equity contribute less to poverty alleviation, as they may have fewer resources to partake in such a non-core business activity. To account for this possibility and rigorously establish the causality, we identify instrumental variables to do a two-stage least squares regression analysis and a two-stage treatment effect regression analysis; we also utilize an exogenous event to perform a difference-in-differences regression analysis. The following subsections discuss each of these regression analyses and the associated results.

4.3.1. Two-Stage least squares regression

Whether and to what extent a firm gets involved in poverty alleviation is endogenous to the cost of equity financing. To address this endogeneity issue, we adopt a two-stage least squares (2SLS) regression, in which instruments not subject to the influences of firms are utilized to create exogenous variation in the key independent variable (*TPA*). In particular, the first-stage regression includes exogenous instrumental variables to estimate the predicted value of *TPA*, which thereby incorporates the exogenous variation triggered by the instruments. As such, the predicted *TPA* is presumably exogenous to the cost of equity. On top of the exogeneity, a valid instrumental variable should further meet two criteria to enable the 2SLS regression results to elicit causal inferences. First is the relevance criterion, which requires the instrument to have a direct impact on the endogenous independent variable (i.e., *TPA*). The second criterion is exclusion restriction, requiring the instrument to have no direct impact on the outcome variable (i.e., *r_equity_avg*) and thus be excluded from the second-stage regression estimation.

We employ two instruments for the analysis: (i) the extent of poverty in the region where the firm's board chairman/chairwoman was born; and (ii) the degree of poverty in the region where a firm is headquartered. Previous studies (Chang et al., 2021; Han et al., 2022; Xu and Ma, 2022) document that executives who had lived in poverty during their early life (i.e., at the ages of 0–18) have stronger compassion towards others, which drives their altruistic behaviors such as donations. Hence, the executives' experience of early-life poverty is likely to have an impact on poverty alleviation by their firms, satisfying the "relevance" criterion required of an instrumental variable. Meanwhile, the executives' early life experience should not be correlated with their firm's financing costs charged by investors, thus meeting the "exclusion restriction" assumption for an instrument variable. Considering that board chairmen/chairwomen are generally the most powerful in influencing the major decision-making by Chinese listed firms (e.g., Wang et al., 2021), we use the chairmen's/chairwomen's early-life poverty experience as the instrument for our 2SLS regression analyses. The tenure of chairmen/chairwomen is generally long among Chinese listed companies, and averages around eight years in our sample firms. So it is unlikely that the incentives for lower cost of capital would induce the appointment or dismissal of a chairman/chairwoman, not least for our sample that spans only five years (2016–2020).

Chinese firms generally do not change their headquarters since they got listed on the stock exchanges, and none of our sample firms does so. The greater extent of poverty in a firm's headquartered region, the more likely the firm would contribute more to poverty alleviation. But the local poverty is unlikely to be *directly* related to an individual firm's financing from the Shanghai and Shenzhen Stock Exchanges. Furthermore, Chinese listed firms tend to provide their products or services in different provinces and/or overseas countries. As such, their performance is unlikely to be systematically associated with local poverty. In sum, regional poverty should meet both the "relevance" criterion and "exclusion restriction" criterion as well and hence be another valid instrument.

We employ the number of impoverished counties and per capita gross domestic product (GDP) to measure (i) the extent of poverty in the chairman's/chairwoman's birthplace and thereby his/her early-life poverty experience and (ii) the degree of poverty in the firm's headquartered region, respectively. Since the data on the per capita GDP for cities were not publicly available until 2001, we use the provincial GDP per capita, while employing both the province-level and city-level numbers of impoverished counties, to construct our instrumental variables. Accordingly, two sets of instrumental variables, (i) *Boardchair_Poverty1*, *Boardchair_Poverty2*, *Boardchair_Poverty3*; (ii) *Headquarter_Poverty1*, *Headquarter_Poverty2*, and *Headquarter_Poverty3*, are used in two 2SLS regressions,

[7] δ is a coefficient of proportionality that measures the importance of unobservable variable(s) relative to that of observed variables in the regression. R_{max} is the R-square derived from a hypothetical regression of the dependent variable on the key independent variable alongside both observed and unobserved control variables. The upper bound of the identified set is set as equal to $\tilde{\beta}$ which is the coefficient on the key independent variable, *TPA*, of the regression model (1). The lower bound of the identified set is β^* which is derived by using the formula provided by Oster (2019): $\beta^* = \tilde{\beta} - \delta[\dot{\beta} - \tilde{\beta}]\frac{R_{max} - \tilde{R}}{\tilde{R} - \dot{R}}$, where $\tilde{R}$ is the R-square value of the regression model (1); $\dot{\beta}$ is the coefficient on *TPA*; and $\dot{R}$ is the R-square of the univariate regression without any control variable.

respectively.[8] *Boardchair_Poverty1* (*Boardchair_Poverty2*) is calculated as the natural logarithm of the number of impoverished counties in the city (in the province), where the chairman/chairwoman was born, for a fiscal year. *Boardchair_Poverty3* is measured by the natural logarithm of the year-level average annual GDP per capita of the province, in which the chairman/chairwoman was born, for the period from his/her birth year to the age of eighteen.[9] *Headquarter_Poverty1* (*Headquarter_Poverty2*) is computed as the natural logarithm of the number of impoverished counties in the city (in the province), where a firm is headquartered, for a fiscal year. *Headquarter_Poverty3* is measured by the natural logarithm of the annual GDP per capita of the province, in which a firm is headquartered, for a fiscal year. The higher value of *Boardchair_Poverty1*, *Boardchair_Poverty2*, *Headquarter_Poverty1* or *Headquarter_Poverty2* (*Boardchair_Poverty3 or Headquarter_Poverty3*), the higher (lower) degree of poverty in the chairman's/chairwoman's birthplace or the firm's headquartered region.

Table 3 reports the 2SLS regression results. The coefficients on the instrumental variables, *Boardchair_Poverty1*, *Boardchair_Poverty2*, and *Boardchair_Poverty3* (*Headquarter_Poverty1*, *Headquarter_Poverty2*, and *Headquarter_Poverty3*) in Column (1) (Column (3)) are all statistically significant at conventional levels. One-standard-deviation increases in *Boardchair_Poverty1*, *Boardchair_Poverty2*, and *Boardchair_Poverty3* (*Headquarter_Poverty1*, *Headquarter_Poverty2*, and *Headquarter_Poverty3*) are associated with changes of *TPA* by 0.577, 1.022, and −1.851 (0.310, 0.349, and −0.965), respectively, which account for 14.05 %, 24.88 %, and 45.04 % (7.56 %, 8.50 %, and 23.48 %) of the full-sample mean of *TPA* and are therefore economically significant. The *Cragg-Donald* F-statistic for the first (second) set of instruments is 79.192 (85.840), which is significantly higher than the critical value of 9.08, beyond which the instrumental variables are considered to be strong (Stock and Yogo, 2005). The Sargan-Hansen J-statistic of the over-identifying restriction test for the first (second) set of instruments is 3.539 (4.100), with a p-value of 0.170 (0.129), thus consistent with the null hypothesis that the instruments are exogenous. We further verify the exclusion restriction assumption for the instrument variables by including them as additional controls in the baseline regression. We run this augmented regression and find statistically nonsignificant coefficients on the instrumental variables, suggesting that they are not correlated with the cost of equity. For the second-stage regression, the coefficients on *TPA* in Columns (2) and (4) are negative and statistically significant at the 1 % level. A one-standard-deviation increase in *TPA* in Column (2) (Column (4)) leads to a decrease of *r_equity_avg* by 0.566 (0.637), which is equivalent to 6.46 % (7.28 %) of the full-sample mean of *r_equity_avg* and is economically significant. Collectively, the 2SLS regression results suggest that corporate contributions to poverty alleviation have a causal impact on the cost of equity.

4.3.2. Two-stage treatment effect regression

Firms with low cost of capital may choose to continue partaking in poverty alleviation. To alleviate the endogeneity issue attributed to the firm's endogenous choice on whether to contribute to poverty alleviation, we conduct a two-stage treatment effect regression analysis. We replace the independent variable in Model (1) with a dummy variable, *TPA_dummy*, to estimate the two-stage treatment effect regression. Table 4 reports the results. In Column (1) (Column (3)) that reports the first-stage regression results, the coefficients on *Boardchair_Poverty1*, *Boardchair_Poverty2*, and *Boardchair_Poverty3* (*Headquarter_Poverty1*, *Headquarter_Poverty2*, and *Headquarter_Poverty3*) are all statistically significant at conventional levels. One-standard-deviation increases in *Boardchair_Poverty1*, *Boardchair_Poverty2*, and *Boardchair_Poverty3* (*Headquarter_Poverty1*, *Headquarter_Poverty2*, and *Headquarter_Poverty3*) lead to changes of *TPA_dummy* by 0.109, 0.215, and −0.093 (0.054, 0.048, and −0.196), respectively, which account for 37.34 %, 73.95 %, and 31.79 % (18.43 %, 16.36 %, and 67.40 %) of the full-sample mean of *TPA_dummy* and are economically significant. Column (2) (Column (4)) reports the second-stage regression results. The coefficient on *TPA_dummy* is negative and statistically significant at the conventional level. A change in *TPA_dummy* causes a decrease of *r_equity_avg* by 1.249 (2.154), which is equivalent to 14.26 % (24.60 %) of the full-sample mean of *r_equity_avg* and is economically significant. These results strengthen our causal inference that poverty alleviation by firms leads to lower costs of their equity financing.

4.3.3. Difference-in-differences regression

To further enhance our causal inference, we perform a difference-in-differences regression analysis. After the National Conference on Development-driven Poverty Alleviation held in December 2015, several policies, such as the "Notice on the Thirteenth Five-year Plan for Poverty Alleviation", were issued in 2016 to call for more corporate participation in reducing poverty. In implementing the policies, the government takes responsibility for determining the impoverished areas to which the corporate donations are deployed, whereas firms have little influence over this process. While the government appeals for donations from firms, the Shanghai and Shenzhen Stock Exchanges have further required Chinese listed firms to disclose in their annual reports the quantitative information of their contributions to poverty alleviation since 2016. These regulatory events in 2016 would cause an exogenous increase in firms' contributions to poverty alleviation, as firms would be pressured into participating in this government-initiated campaign. Yet, these policies are aimed at stimulating corporate participation in poverty alleviation and should therefore have no direct impact on firms' financing costs. For this reason, the enforcement of the poverty-alleviation policies in 2016 should be an exogenous event suited for use in a quasi-natural experiment to establish a causal relationship between firms' poverty alleviation and their cost of equity.

Difference-in-differences (DID) research design also requires the identification of a treatment (control) group, of which firms are (not) subject to the regulatory events in 2016. Accordingly, firms involved in poverty alleviation for at least one year for the period

[8] The Spearman correlation between the instrumental variables is below 0.5 and not statistically significant at conventional 5% levels, suggesting that they are not multicollinear with each other.

[9] There are a number of missing data on the birthplaces of chairmen/chairwomen and thus on the first set of instrumental variables (i.e., *Boardchair_Poverty1*, *Boardchair_Poverty2*, and *Boardchair_Poverty3*), leading to a reduction of sample used in the associated 2SLS regression analysis.

Table 3
Control for endogeneity via two-stage instrumental-variables regression.

Variables	(1) First-stage Dependent variable = TPA_t	(2) Second-stage Dependent variable = $r\_equity\_avg_t$	(3) First-stage Dependent variable = TPA_t	(4) Second-stage Dependent variable = $r\_equity\_avg_t$
$Boardchair\_Poverty1_t$	1.535***			
	(2.637)			
$Boardchair\_Poverty2_t$	0.689***			
	(5.286)			
$Boardchair\_Poverty3_t$	−4.721***			
	(−6.597)			
$Headquarter\_Poverty1_t$			1.059**	
			(2.349)	
$Headquarter\_Poverty2_t$			0.286***	
			(3.207)	
$Headquarter\_Poverty3_t$			−1.417***	
			(−9.106)	
TPA_t		−0.087***		−0.098***
		(−3.264)		(−3.339)
$size_t$	−0.013	0.226**	1.311***	0.179**
	(−0.040)	(2.073)	(10.656)	(2.394)
soe_t	0.636*	0.166	0.554***	0.234***
	(1.913)	(1.594)	(2.814)	(3.503)
age_t	0.278	−0.083	0.933***	−0.024
	(0.452)	(−0.475)	(2.780)	(−0.213)
ROA_t	3.043	−0.453	4.171***	0.315
	(1.335)	(−0.418)	(4.017)	(0.550)
$leverage_t$	7.312***	3.383***	0.791	3.319***
	(5.105)	(9.046)	(1.524)	(14.858)
$salesgrowth_t$	−0.222	−0.020	−0.172**	−0.155***
	(−1.469)	(−0.313)	(−2.500)	(−4.696)
$duality_t$	0.039	0.060	−0.413**	0.165**
	(0.109)	(0.521)	(−2.463)	(2.555)
$board\_indp_t$	1.557	−0.291	2.571	0.791
	(0.534)	(−0.306)	(1.626)	(1.442)
$top1\_shares_t$	2.311*	1.184***	4.905***	1.681***
	(1.898)	(3.107)	(7.068)	(6.042)
$operating\_cash_t$	7.318***	−2.519***	3.879***	−2.361***
	(3.511)	(−2.746)	(3.797)	(−4.588)
$cash\_volatility_t$	−9.379**	3.333*	−7.744***	1.879*
	(−2.345)	(1.899)	(−3.769)	(1.913)
$salaries_t$	−0.232	0.156*	0.371**	0.045
	(−0.843)	(1.718)	(2.412)	(0.879)
$admin\_expense_t$	1.430	−1.594*	−1.003	−1.680***
	(0.587)	(−1.839)	(−0.807)	(−3.136)
$ROA\_volatility_t$	−1.955	0.038	−1.872	0.631
	(−0.702)	(0.032)	(−1.485)	(0.946)
$ab\_accrual_t$	1.217***	−0.213	0.912***	−0.073
	(2.942)	(−0.880)	(3.426)	(−0.477)
intercept	−13.687***	−6.688***	−12.495***	−2.416***
	(−5.682)	(−7.563)	(−5.670)	(−3.890)
Year-fixed effects	included	included	included	included
Industry-fixed effects	included	included	included	included
No. of obs.	2,386	2,386	7,883	7,883
Adj. R^2	0.179	0.064	0.153	0.059
Sargan-Hansen J-statistic (p-value)	3.539 (0.170)		4.100 (0.129)	
Cragg-Donald F-statistic	79.192		85.840	

Notes: Table 3 presents the results of two-stage least squares regression for the association between firms' contributions to poverty alleviation (*TPA*) and the cost of equity (*r_equity_avg*). Columns (1) and (2) (Columns (3) and (4)) report the results from using *Boardchair_Poverty1*, *Boardchair_Poverty2,* and *Boardchair_Poverty3* (*Headquarter_Poverty1*, *Headquarter_Poverty2*, and *Headquarter_Poverty3*) as the instrumental variables. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in all regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 4
Two-stage treatment effect regression.

Variables	(1) Dependent variable = TPA_dummy_t	(2) Dependent variable = $r\_equity\_avg_t$	(3) Dependent variable = TPA_dummy_t	(4) Dependent variable = $r\_equity\_avg_t$
$Boardchair\_Poverty1_t$	0.289***			
	(3.909)			
$Boardchair\_Poverty2_t$	0.145***			
	(7.285)			
$Boardchair\_Poverty3_t$	−0.236***			
	(−3.160)			
$Headquarter\_Poverty1_t$			0.183***	
			(3.004)	
$Headquarter\_Poverty2_t$			0.039***	
			(2.681)	
$Headquarter\_Poverty3_t$			−0.288***	
			(−11.804)	
TPA_dummy_t		−1.249***		−2.154***
		(−3.379)		(−7.194)
$size_t$	0.358***	0.207**	0.350***	0.205***
	(5.104)	(2.098)	(12.370)	(3.791)
soe_t	0.118**	0.175**	0.133***	0.269***
	(2.018)	(1.980)	(3.856)	(4.858)
age_t	0.189*	0.074	0.400***	0.273***
	(1.767)	(0.469)	(6.775)	(2.809)
ROA_t	−0.700	0.383	0.337	1.175**
	(−0.960)	(0.363)	(0.928)	(2.132)
$leverage_t$	0.702***	3.502***	0.311***	3.606***
	(3.116)	(11.070)	(2.755)	(20.357)
$salesgrowth_t$	−0.035	0.014	−0.048**	−0.151***
	(−0.891)	(0.255)	(−2.531)	(−5.307)
$duality_t$	−0.076	0.053	−0.103***	0.169***
	(−1.065)	(0.511)	(−2.711)	(2.918)
$board\_indp_t$	0.627	−0.014	0.579**	1.155**
	(1.168)	(−0.017)	(1.962)	(2.483)
$top1\_shares_t$	0.221	1.000***	0.725***	1.627***
	(1.098)	(3.231)	(6.578)	(8.245)
$operating\_cash_t$	3.279***	−2.207**	1.418***	−2.139***
	(5.141)	(−2.470)	(4.347)	(−4.391)
$cash\_volatility_t$	−4.003***	2.438*	−2.444***	0.913
	(−3.910)	(1.676)	(−4.596)	(1.113)
$salaries_t$	0.053	0.320***	0.088***	0.167***
	(1.119)	(4.607)	(3.367)	(4.097)
$admin\_expense_t$	−1.053*	−5.207***	−0.968***	−4.682***
	(−1.677)	(−6.212)	(−2.900)	(−9.921)
$ROA\_volatility_t$	1.667**	3.304***	1.280***	2.959***
	(2.247)	(2.939)	(3.624)	(5.130)
$ab\_accrual_t$	0.967***	0.087	0.555***	0.420**
	(3.191)	(0.333)	(3.606)	(2.406)
intercept	−9.122***	−1.901	−8.385***	−0.571
	(−4.960)	(−0.882)	(−12.279)	(−0.437)
Year-fixed effects	included	included	included	included
Industry-fixed effects	included	included	included	included
No. of obs.	2,386	2,386	7,883	7,883
Wald χ^2 (p-value)	777.97 (0.000)		1992.95 (0.000)	

Notes: Table 4 presents the results of the two-stage treatment effect regression for the association between firms' contributions to poverty alleviation (*TPA_dummy*) and the cost of equity capital (*r_equity_avg*). Columns (1) and (2) (Columns (3) and (4)) report the results from using *Boardchair_Poverty1*, *Boardchair_Poverty2*, and *Boardchair_Poverty3* (*Headquarter_Poverty1*, *Headquarter_Poverty2*, and *Headquarter_Poverty3*) as the instrumental variables. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in all the regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. The p-values for Wald χ^2 are close to zero. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

2016–2018 are classified as treatment firms, while those that do not contribute to poverty alleviation in any year during the period are categorized as control firms. There might exist systematic differences in firm characteristics between the treatment firms and control firms. To rectify this issue, we do a nearest-neighborhood propensity-score matching to obtain a sample composed of treatment firms and matched control firms. Specifically, we match each treatment firm, with replacement, with a control firm by using the closest propensity score within a caliper of 1 %. The propensity score is estimated from a logit regression where the binary variable

(*Treat_TPA*) is regressed on a vector of matching covariates, including firm size (*size*), return on assets (*ROA*), sales growth (*salesgrowth*), financial leverage (*leverage*), board independence (*board_indp*), financial health (*operating_cash*), the volatility of returns on assets (*ROA_volatility*) as well as the year and industry dummies.[10] All the matching covariates are defined in Appendix 3.

After the matching, we obtain a sample comprising 8,762 firm-year observations. Panel A of Table 5 reports the results from testing the covariate balance between the treatment firms and matched control firms. All the mean differences in the covariates are not statistically significant, with p-values above 10 %. The standardized bias is less than 10 % for all the covariates. These results indicate that our post-matched sample achieves a covariate balance and that our matching substantially reduces differences between the treatment firms and control firms. We then use the post-matched sample to run the following difference-in-differences OLS regression:

$$\begin{aligned} r\_equity\_avg_t = {} & \alpha_0 + \alpha_1 Post{*}Treat\_TPA_t + \alpha_2 Treat\_TPA_t + \alpha_3 size_t + \alpha_4 soe_t + \alpha_5 age_t + \alpha_6 ROA_t + \alpha_7 leverage_t \\ & + \alpha_8 salesgrowth_t + \alpha_9 duality_t + \alpha_{10} board\_indp_t + \alpha_{11} top1\_shares_t + \alpha_{12} operating\_cash_t + \alpha_{13} cash\_volatility_t \\ & + \alpha_{14} salaries_t + \alpha_{15} admin\_expense_t + \alpha_{16} ROA\_volatility_t + \alpha_{17} ab\_accrual_t + year\_dummies + industry\_dummies + \varepsilon_t \end{aligned} \quad (2)$$

where *Post* is the time indicator variable equal to 1 (0) if the firm is in the period 2016–2018 (2013–2015). *Treat_TPA* equals 1 (0) if a firm is in the treatment (control) group. The interaction term, *Post*Treat_TPA*, captures changes in the cost of equity of the treatment firms, relative to those of control firms, from the pre-event period (i.e., 2013–2015) to the post-event period (i.e., 2016–2018). *Post* is not included in the regression as this variable is potentially multicollinear with the year dummies.

The parallel trends assumption behind the difference-in-differences regression estimation requires that, absent the treatment event, the difference in the outcome variable between the treatment group and control group is relatively constant over time. To test this assumption, we utilize two multivariate methods. First, we re-run Model (2) by using 2012 and 2013 (2013 and 2014 as well as 2014 and 2015) as alternative pre- and post-event periods, respectively. As shown in Panel B of Table 5, the coefficients on *Post*Treat_TPA* are all statistically nonsignificant, indicating that there is no substantive change in the cost of equity for the treatment firms relative to the control firms during these years. Second, we modify Model (2) by substituting *Post*Treat_TPA* for the interaction terms between year dummies and *Treat_TPA*, and run this modified regression model. Panel C of Table 5 presents the regression results. The interaction terms, *Pre3*Treat_TPA*, *Pre2*Treat_TPA*, and *Pre1*Treat_TPA*, all take on a coefficient that is statistically nonsignificant, suggesting that the parallel trends assumption holds for our DID research design. Fig. 1 provides graphical representations of the results. It is evident that the estimated coefficients in the pre-event period are close to 0 without a noticeable variation over the years; by contrast, those in the post-event period are not only significantly negative but also become greater in magnitude over the years.

The results from estimating the regression model (2) are reported in Column (1) under Panel D of Table 5. The coefficient on *Post*Treat_TPA* is negative and statistically significant at the 1 % level. The point estimate on the DID estimator is −0.242, which accounts for 28.34 % of one standard deviation of *r_equity_avg* for the sample and is economically significant. Column (2) reports the results of the DID model that includes *Treat_TPA*, *Post*, and industry dummies, among others, but excludes year dummies. They are qualitatively similar to those in Column (2), indicating that the firms which contribute to poverty alleviation in response to the campaign launched by the government experience a significantly greater reduction in the cost of equity, relative to the firms without contribution to poverty alleviation. The poverty-alleviation policies promulgated in 2016 might also cause exogenous changes in some unobserved firm-specific factors that affect corporate financing. To ease this concern, we also run firm-fixed-effects regression for Model (2). Industry dummies and *Treat_TPA* are multicollinear with firm-fixed effects and are thus substituted for the interacted industry-year dummies in the regression estimation. The results are displayed in Column (3) under Panel D. The coefficient on *Post*Treat_TPA* is both statistically and economically significant, reinforcing our causal inference that contributions to poverty alleviation lower the cost of equity for firms.

4.4. Alternative measures of firms' contributions to poverty alleviation and those of the cost of equity

We generate three variables, *TPA_dummy*, *TPA_monetary*, and *TPA_nonmonetary*, which alternatively measure firms' contributions to poverty alleviation. *TPA_dummy* equals one if a firm contributes to poverty alleviation in a fiscal year, and zero otherwise. *TPA_monetary* (*TPA_nonmonetary*) is calculated as the natural logarithm of the monetary (non-monetary) contribution of a firm to poverty alleviation during a fiscal year. We use these variables, respectively, as the alternative key independent variable to re-run the baseline regression, and report the results in Panel A of Table 6. The coefficient on *TPA_dummy* is negative with a statistical significance level of 1 %, indicating that the firms which opt to participate in poverty alleviation enjoy a lower cost of equity financing. The negative and statistically significant coefficients on *TPA_monetary* and *TPA_nonmonetary* imply that both the monetary and non-monetary contributions to poverty alleviation result in reduced cost of equity for firms. Panel B of Table 6 reports the results for the regressions that employ alternative measures of the cost of equity - r_{gls}, r_{ct}, r_{oj}, r_{mpeg}, and their composite measure derived from the principal component analysis (*r_equity_comp*). The coefficients on *TPA* are negative and statistically significant at conventional levels for all these regressions.

[10] To elicit a causal inference, the DID regression analysis requires a random assignment of observations into the treatment group and the control group. We concede that our propensity-score matching (PSM) might not help fulfil this requirement, which remains a limitation of our PSM-DID analysis. Yet, we keep this analysis as with the prevailing literature (e.g., Ge and Lennox, 2011; Chan et al., 2012; Gallemore et al., 2014; Haw et al., 2014). Besides, we also do a DID regression analysis without using the PSM, and obtain qualitatively the same results.

Table 5

Control for endogeneity via difference-in-differences regression. Panel A: Tests of covariate balance between the treatment and control firms **Panel B:** Tests of the parallel trends assumption by using alternative pre- and post-event years for DID tests. **Panel C:** Test of the parallel trends assumption by interacting year dummies with the treatment variable **Panel D:** Difference-in-differences regression of the cost of equity.

Variables	Matching statuses	No. of observations	No. of firms	Mean for treatment firms	Mean for control firms	Standardize bias (%)	t-stat
$size_t$	Unmatched	9,813	2,513	22.4110	21.9360	67.0	35.45***
	Matched	8,762	2,389	22.4121	22.4080	0.2	0.08
ROA_t	Unmatched	9,813	2,513	0.0570	0.0639	−2.9	−1.48
	Matched	8,762	2,389	0.0570	0.0578	−2.0	−0.96
$salesgrowth_t$	Unmatched	9,813	2,513	0.3552	0.4241	1.5	0.87
	Matched	8,762	2,389	0.3552	0.3698	−1.3	−0.73
$leverage_t$	Unmatched	9,813	2,513	0.4711	0.3855	42.1	21.77***
	Matched	8,762	2,389	0.4711	0.4746	−3.3	−1.48
$board\_indp_t$	Unmatched	9,813	2,513	0.3757	0.3738	26.8	14.04***
	Matched	8,762	2,389	0.3757	0.3752	3.3	1.54
$operating\_cash_t$	Unmatched	9,813	2,513	0.0567	0.0482	12.4	6.36***
	Matched	8,762	2,389	0.0567	0.0566	−0.6	−0.26
$ROA\_volatility_t$	Unmatched	9,813	2,513	0.0374	0.0425	−2.5	−1.18
	Matched	8,762	2,389	0.0374	0.0375	−0.1	−0.37

Variables	Dependent variable = $r\_equity\_avg_t$		
	(1) 2012 vs. 2013	(2) 2013 vs. 2014	(3) 2014 vs. 2015
*Post*Treat_TPA*	−0.296	−0.163	−0.256
	(−1.373)	(−1.419)	(−0.325)
$size_t$	0.175	0.415***	0.180*
	(1.382)	(4.132)	(1.828)
soe_t	0.200	−0.051	0.198*
	(1.646)	(−0.494)	(1.953)
age_t	0.054	0.120	−0.184
	(0.353)	(0.836)	(−1.232)
ROA_t	2.052	0.191	0.806
	(1.255)	(0.122)	(0.560)
$leverage_t$	3.828***	3.175***	2.915***
	(7.831)	(7.010)	(7.314)
$salesgrowth_t$	−0.164***	0.011	0.142***
	(−2.820)	(0.195)	(2.619)
$duality_t$	0.287*	0.012	0.266**
	(1.937)	(0.096)	(2.259)
$board\_indp_t$	−0.878**	−0.310	−0.550*
	(−2.435)	(−1.061)	(−1.914)
$top1\_shares_t$	2.602***	2.772***	1.745***
	(6.139)	(7.044)	(4.399)
$operating\_cash_t$	−1.618	−5.497***	−0.345
	(−1.111)	(−4.085)	(−0.262)
$cash\_volatility_t$	0.110	3.832**	2.153
	(0.053)	(2.235)	(1.361)
$salaries_t$	0.115	0.038	0.087
	(1.019)	(0.392)	(0.977)
$admin\_expense_t$	0.511	−1.458*	−1.539**
	(0.436)	(−1.869)	(−2.180)
$ROA\_volatility_t$	1.514	0.434	0.436
	(1.242)	(0.791)	(0.767)
$ab\_accrual_t$	−0.134	−2.082**	1.328
	(−0.115)	(−1.987)	(1.337)
intercept	3.442	−1.756	3.332*
	(1.298)	(−0.853)	(1.666)
Industry-fixed effects	included	included	included
Adj. R^2	0.223	0.364	0.202
No. of obs.	1,125	1,240	1,362

Variables	Dependent variable = $r\_equity\_avg_t$
*Pre3*Treat_TPA*	−0.027
	(−0.245)
*Pre2*Treat_TPA*	−0.104
	(−1.227)
*Pre1*Treat_TPA*	−0.013
	(−0.133)
*Post1*Treat_TPA*	−0.338***
	(−3.746)

(*continued on next page*)

Table 5 (*continued*)

Variables	Dependent variable = *r_equity_avg*$_t$
*Post2*Treat_TPA*	−0.418***
	(−4.023)
*Post3*Treat_TPA*	−0.472***
	(−3.933)
size$_t$	0.305***
	(6.406)
soe$_t$	0.078
	(1.525)
age$_t$	−0.065
	(−0.722)
ROA$_t$	0.980*
	(1.672)
leverage$_t$	2.885***
	(14.917)
salesgrowth$_t$	−0.053**
	(−1.965)
duality$_t$	0.191***
	(3.455)
board_indp$_t$	0.475
	(0.992)
top1_shares$_t$	1.557***
	(8.206)
operating_cash$_t$	−2.586***
	(−6.152)
cash_volatility$_t$	3.494***
	(4.302)
salaries$_t$	0.077*
	(1.699)
admin_expense$_t$	−1.424***
	(−3.460)
ROA_volatility$_t$	0.028
	(0.087)
ab_accrual$_t$	−0.106
	(−0.730)
intercept	−0.687
	(−0.670)
Year-fixed effects	included
Industry-fixed effects	included
No. of obs.	8,762
Adj. R^2	0.286

Variables	Dependent variable = *r_equity_avg*$_t$	Dependent variable = *r_equity_avg*$_t$	Dependent variable = *r_equity_avg*$_t$
*Post*Treat_TPA*	−0.242***	−0.251***	−0.125**
	(−3.076)	(−3.157)	(−2.068)
Treat_TPA	−0.063	−0.041	
	(−0.863)	(−0.562)	
Post		0.218***	
		(3.739)	
size$_t$	0.297***	0.202***	0.670***
	(6.252)	(4.215)	(6.829)
soe$_t$	0.078	0.124**	−0.014
	(1.505)	(2.347)	(−0.203)
age$_t$	−0.070	−0.114	0.827
	(−0.772)	(−1.263)	(1.399)
ROA$_t$	0.968*	2.258***	0.393
	(1.652)	(3.721)	(0.549)
leverage$_t$	2.896***	3.106***	2.645***
	(14.975)	(15.704)	(8.674)
salesgrowth$_t$	−0.051*	−0.072***	−0.031
	(−1.898)	(−2.580)	(−1.229)
duality$_t$	0.191***	0.203***	−0.061
	(3.442)	(3.566)	(−0.693)
board_indp$_t$	0.455	0.385	0.159
	(0.952)	(0.781)	(0.243)
top1_shares$_t$	1.543***	1.543***	1.201***
	(8.097)	(7.840)	(2.791)
operating_cash$_t$	−2.584***	−2.710***	−0.600
	(−6.138)	(−6.035)	(−1.224)

(*continued on next page*)

Table 5 (*continued*)

Variables	Dependent variable = $r\_equity\_avg_t$	Dependent variable = $r\_equity\_avg_t$	Dependent variable = $r\_equity\_avg_t$
$cash\_volatility_t$	3.470***	3.096***	0.348
	(4.263)	(3.621)	(0.366)
$salaries_t$	0.076*	0.165***	0.080
	(1.669)	(3.598)	(1.029)
$admin\_expense_t$	−1.424***	−3.243***	−1.526**
	(−3.462)	(−7.737)	(−2.063)
$ROA\_volatility_t$	0.040	0.682**	0.666*
	(0.121)	(1.998)	(1.702)
$ab\_accrual_t$	−0.092	0.267*	−0.096
	(−0.628)	(1.756)	(−0.700)
intercept	−0.495	0.347	−11.032***
	(−0.484)	(0.339)	(−4.144)
Year-fixed effects	included	excluded	excluded
Industry-fixed effects	included	included	excluded
Year × industry-fixed effects	excluded	excluded	included
Firm-fixed effects	excluded	excluded	included
No. of obs.	8,762	8,762	8,368
Adj. R^2	0.284	0.201	0.626

Notes: Panel C of Table 5 presents the results of the multivariate test of the parallel trends assumption for the difference-in-differences regression estimation. The multivariate test is done based on the difference-in-differences regression model that substitutes *Post*Treat_TPA* for the interaction terms between year dummies and the treatment indicator variable (*Treat_TPA*). *Treat_TPA* equals 1 if a firm contributes to poverty alleviation for at least one year for the period 2016–2018, and 0 otherwise. *Pre3*, *Pre2*, *Pre1*, *Post1*, *Post2*, and *Post3* are year dummies for the years 2013, 2014, 2015, 2016, 2017, and 2018, respectively. For instance, *Pre3* equals 1 if the observation is for the year 2013, and 0 otherwise. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in the regression, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Notes: Panel A of Table 5 reports the results from testing the covariate balance between the treatment firms and control firms. The sample period ranges from 2013 to 2018. The regression run for the propensity-score matching involves 9,813 firm-year observations. We use seven covariates - *size*, *ROA*, *salesgrowth*, *leverage*, *board_indp*, *operating_cash*, and *ROA_volatility*. The definitions of all variables are provided in Appendix 3. The treatment indicator variable, *Treat_TPA*, equals 1 if a firm contributes to poverty alleviation for at least one year for the period 2016–2018, and 0 otherwise. We match each treatment firm (i.e., the firm involved in the poverty alleviation for at least one year) with a control firm (i.e., the firm that does not participate at all in poverty alleviation), with replacement, by using the closest propensity score within a caliper of 1 %. For both the unmatched and matched samples, the t-statistics from the two-sample tests of mean and the standardized bias are calculated to check the covariate balance between the treatment group (*Treat_TPA* = 1) and control group (*Treat_TPA* = 0). Year and industry dummies are included in all the regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors. *, **, and *** indicate the two-tailed statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

Notes: Panel B of Table 5 reports the multivariate tests of parallel trends assumption by using alternative pre- and post-event years before the year 2016 for the DID tests. The treatment indicator variable, *Treat_TPA*, equals 1 if a firm contributes to poverty alleviation for at least one year during the period 2016–2018 and 0 otherwise. *Post* is the time indicator variable that equals 1 (0) if the firm is in the alternative post-event year (pre-event year) before 2016. The interaction term, *Post*Treat_TPA*, captures the impact of poverty alleviation on the cost of equity. Columns (1), (2), and (3) present the results from using 2012 and 2013, 2013 and 2014, or 2014 and 2015 as the alternative pre- and post-event periods, respectively, for the DID estimation. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Industry dummies are included in the regression, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Notes: Panel D of Table 5 illustrates the OLS (firm-fixed effect) difference-in-differences (DID) regression results of the cost of equity. The sample period ranges from 2013 to 2018. The treatment indicator variable, *Treat_TPA*, equals 1 if a firm contributes to poverty alleviation for at least one year during the period 2016–2018, and 0 otherwise. *Post* is the time indicator variable that equals 1 (0) if the firm is in the period 2016–2018 (2013–2015). The interaction term, *Post*Treat_TPA*, captures the impact of poverty alleviation on the cost of equity. Column (1) reports the OLS regression results of the DID model that includes *Treat_TPA*, year dummies, and industry dummies, among others. Column (2) reports the OLS regression results of the DID model that includes *Treat_TPA*, *Post*, and industry dummies, among others. Column (3) reports the firm-fixed-effects regression results of the DID model that includes the year × industry dummies, firm dummies, among others, and excludes *Treat_*TPA and *Post*. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

4.5. Mechanism tests for the association between firms' contributions to poverty alleviation and the cost of equity

The poverty alleviation by a firm helps strengthen its reputation among, and its relationship with, various business stakeholders, thereby improving its future performance and reducing its business risk. As such, investors are likely to charge lower costs for providing the firm with equity capital. On this basis, we posit that the enhanced corporate reputation is the channel through which the contributions to poverty alleviation by a firm reduce its cost of equity financing. We measure the firm's reputation by (i) the awards it received for contributing to poverty alleviation (*reputation_reward*) and (ii) the positive media news on the firm (*reputation_news*). In China, various awards are set up by different levels of governments or social groups to recognize the firms' contributions to poverty

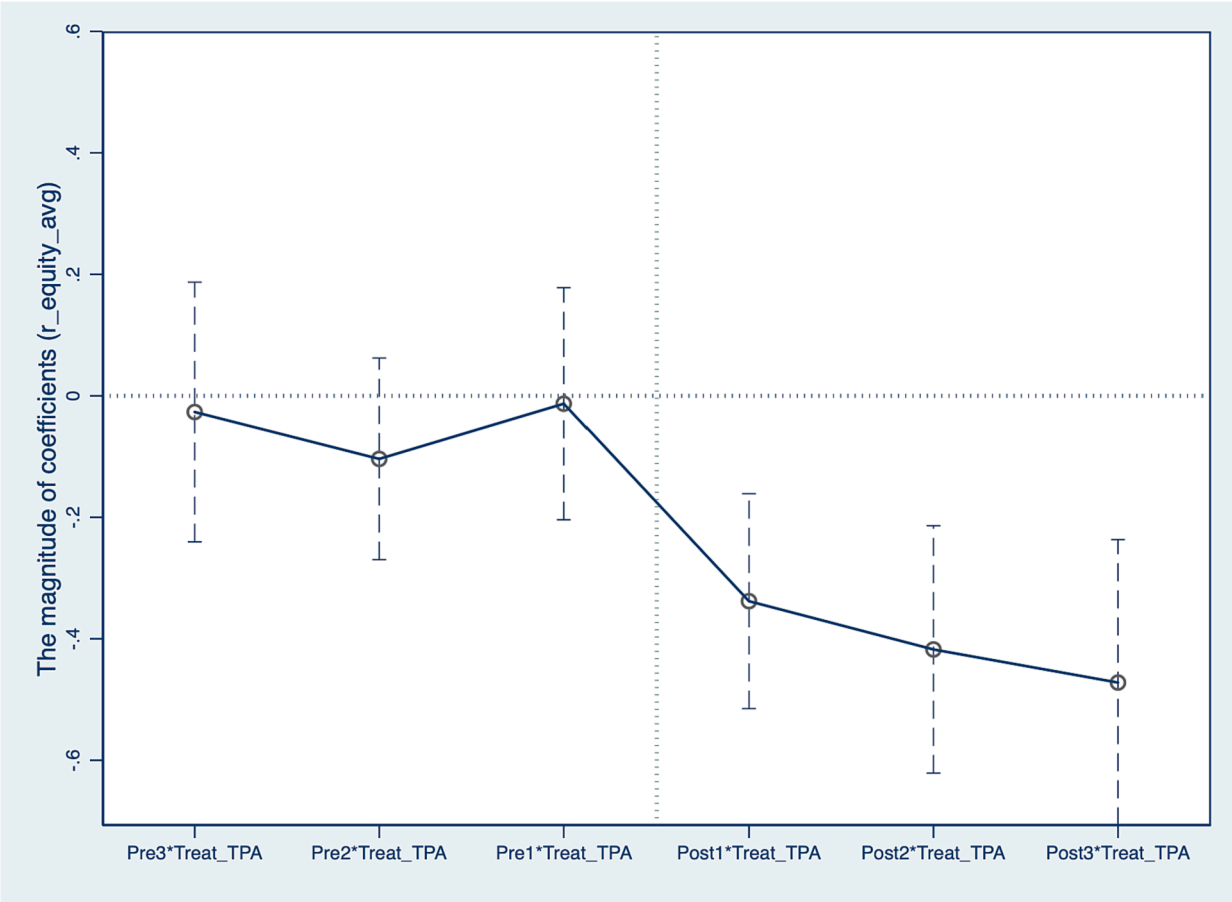

Fig. 1. Grapical presentation of the multivariate test of parallel trend assumption for the DID regression of cost of equity. Notes: Fig. 1 provides a graphical presentation of the results reported in Panel C of Table 5, which pertain to the coefficient test of the parallel trends assumption for the difference-in-differences regression estimation on the association between firms' contributions to poverty alleviation and the cost of equity (*r_equity_avg*). The horizontal axis represents the interaction terms between *Pre** (*Post**) and *Treat_TPA*; the vertical axis represents the magnitude of the coefficient of interaction terms between *Pre** (*Post**) and *Treat_TPA* and the corresponding 95% confidence interval. *Treat_TPA* equals 1 if a firm contributes to poverty alleviation for at least one year for the period 2016–2018, and 0 otherwise. *Pre3*, *Pre2*, *Pre1*, *Post1*, *Post2*, and *Post3* are year dummies for the years 2013, 2014, 2015, 2016, 2017, and 2018, respectively. For instance, *Pre3* equals 1 if the observation is for the year 2013, and 0 otherwise. All the continuous variables used in the multivariate tests are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in the regression, but their results are not reported for brevity.

alleviation. To the extent that the media covers the positive news about firms and actively propagates their good deeds to the public, the firms would enjoy high reputation and trust among their business stakeholders. *Reputation_reward* is computed as the natural logarithm of the sum of the scores for the poverty alleviation awards won by a firm in a fiscal year. Specifically, *reputation_reward* equals 5 if a firm won a national award; 4 for a provincial award; 3 for a municipal award; 2 for a district or county award; and 1 for a non-governmental award which is often conferred by social groups. *reputation_reward* equals 0 if a firm does not win any award for its poverty alleviation activities in a fiscal year. *reputation_news* is calculated as the natural logarithm of the total number of positive media news about a firm in a fiscal year. The principal component analysis is then used to create a composite measure (*reputation_comp*) of the two proxies for a firm's reputation (*reputation_reward* and *reputation_news*). From another perspective, the media and government are two critical indirect stakeholders, so *reputation_comp* is not only a measure of corporate reputation but also reflects the recognition by these indirect stakeholders for a firm's contribution to poverty alleviation.

Suppliers and customers are two key direct stakeholders for a firm, so their relationship with, and trust in, the firm would shape the investors' perceptions of corporate risks and prospects, and thus impact its cost of equity. Large trade credits granted by suppliers reflect their recognition of the firm's reputation and creditworthiness, while high sales of products and services are indicative of the firm's reputation and trustworthiness among its customers. Therefore, we use trade credits (*trade_credit*) and sales (*sales*) as another two measures of the firm's reputation and trust with its external stakeholders, which are expected to mediate the association between corporate contributions to poverty alleviation and the cost of equity. We do the mediation analysis by running the following regressions:

Table 6
Robustness tests using alternative variable measurements. Panel A: Alternative measures of firms' contributions to poverty alleviation **Panel B:** Alternative measures of the cost of equity.

Variables	Dependent variable = $r\_equity\_avg_t$	Dependent variable = $r\_equity\_avg_t$	Dependent variable = $r\_equity\_avg_t$
TPA_dummy_t	−0.226***		
	(−3.502)		
$TPA\_monetary_t$		−0.016***	
		(−3.355)	
$TPA\_nonmonetary_t$			−0.023***
			(−3.360)
$size_t$	0.023	0.024	0.019
	(0.476)	(0.498)	(0.400)
soe_t	0.177***	0.178***	0.166***
	(2.898)	(2.915)	(2.728)
age_t	−0.116	−0.119	−0.132
	(−1.066)	(−1.103)	(−1.221)
ROA_t	0.116	0.139	0.106
	(0.208)	(0.250)	(0.190)
$leverage_t$	3.176***	3.181***	3.181***
	(15.021)	(15.033)	(15.055)
$salesgrowth_t$	−0.138***	−0.138***	−0.139***
	(−4.378)	(−4.367)	(−4.413)
$duality_t$	0.214***	0.215***	0.216***
	(3.531)	(3.547)	(3.547)
$board\_indp_t$	0.491	0.504	0.514
	(0.968)	(0.992)	(1.010)
$top1\_shares_t$	1.221***	1.226***	1.184***
	(5.702)	(5.721)	(5.532)
$operating\_cash_t$	−2.731***	−2.737***	−2.752***
	(−5.723)	(−5.737)	(−5.771)
$cash\_volatility_t$	2.706***	2.702***	2.739***
	(2.957)	(2.955)	(2.984)
$salaries_t$	0.034	0.037	0.035
	(0.696)	(0.755)	(0.720)
$admin\_expense_t$	−1.897***	−1.904***	−1.855***
	(−3.670)	(−3.677)	(−3.607)
$ROA\_volatility_t$	0.310	0.306	0.365
	(0.477)	(0.470)	(0.561)
$ab\_accrual_t$	−0.159	−0.163	−0.169
	(−1.062)	(−1.085)	(−1.121)
intercept	6.481***	6.411***	6.564***
	(5.941)	(5.842)	(6.037)
Year-fixed effects	included	included	included
Industry-fixed effects	included	included	included
No. of obs.	7,883	7,883	7,883
Adj. R^2	0.229	0.229	0.229

Variables	(1)Dependent variable = $(r_{gls})_t$	(2)Dependent variable = $(r_{ct})_t$	(3)Dependent variable = $(r_{oj})_t$	(4) Dependentvariable = $(r_{mpeg})_t$	(5) Dependentvariable= $(r\_equity\_comp)_t$
TPA_t	−0.021***	−0.011***	−0.019**	−0.023***	−0.004**
	(−5.666)	(−3.991)	(−1.978)	(−2.698)	(−2.140)
$size_t$	0.159***	0.242***	−0.189**	−0.181**	−0.039*
	(4.201)	(8.402)	(−1.993)	(−2.117)	(−1.856)
soe_t	0.061	0.018	0.409***	0.318***	0.087***
	(1.204)	(0.470)	(3.344)	(2.965)	(3.267)
age_t	−0.153*	0.044	−0.293	−0.122	−0.050
	(−1.666)	(0.615)	(−1.398)	(−0.648)	(−1.092)
ROA_t	−3.626***	−3.510***	3.524***	4.883***	1.203***
	(−9.468)	(−12.979)	(3.200)	(4.893)	(4.871)
$leverage_t$	4.561***	1.854***	3.188***	4.184***	0.844***
	(25.506)	(14.508)	(7.885)	(11.376)	(9.445)
$salesgrowth_t$	−0.132***	−0.129***	−0.158**	−0.143***	−0.037***
	(−5.839)	(−7.767)	(−2.514)	(−2.642)	(−2.813)
$duality_t$	0.117**	0.084**	0.393***	0.329***	0.085***
	(2.331)	(2.218)	(3.255)	(3.063)	(3.217)
$board\_indp_t$	0.246	0.252	1.043	1.190	0.235
	(0.589)	(0.801)	(1.016)	(1.346)	(1.056)
$top1\_shares_t$	2.755***	1.903***	−0.087	−0.158	−0.063
	(16.108)	(14.038)	(−0.206)	(−0.420)	(−0.687)

(*continued on next page*)

Table 6 (*continued*)

Variables	(1)Dependent variable = $(r_{gls})_t$	(2)Dependent variable = $(r_{ct})_t$	(3)Dependent variable = $(r_{oj})_t$	(4) Dependentvariable = $(r_{mpeg})_t$	(5) Dependentvariable= $(r\_equity\_comp)_t$
operating_cash$_t$	−0.696*	−0.542**	−3.135***	−4.201***	−0.919***
	(−1.891)	(−2.051)	(−3.379)	(−4.917)	(−4.441)
cash_volatility$_t$	1.630**	1.416***	5.130***	3.360**	1.000**
	(2.414)	(2.761)	(2.726)	(2.066)	(2.442)
salaries$_t$	−0.180***	−0.145***	0.278***	0.236***	0.052**
	(−4.442)	(−4.781)	(2.802)	(2.687)	(2.426)
admin_expense$_t$	0.518	1.201***	−4.057***	−3.824***	−0.921***
	(1.049)	(3.205)	(−4.152)	(−4.442)	(−4.279)
ROA_volatility$_t$	1.270***	1.553***	−1.398	0.149	−0.084
	(2.895)	(4.871)	(−1.023)	(0.127)	(−0.282)
ab_accrual$_t$	−0.218*	−0.141*	−0.412	−0.281	−0.073
	(−1.919)	(−1.651)	(−1.442)	(−1.198)	(−1.202)
intercept	2.289***	1.327**	12.678***	9.424***	−0.190
	(2.616)	(2.037)	(5.924)	(4.923)	(−0.403)
Year-fixed effects	included	included	included	included	included
Industry-fixed effects	included	included	included	included	included
No. of obs.	7,883	7,883	7,883	7,883	7,883
Adj. R^2	0.295	0.239	0.165	0.185	0.186

Notes: Panel A of Table 6 reports the results of the baseline regression that uses alternative measures of firms' contributions to poverty alleviation. Columns (1), (2), and (3) report the results from using *TPA_dummy*, *TPA_monetary*, and *TPA_nonmonetary*, respectively, as the proxies for firms' contributions to poverty alleviation. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in all regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Notes: Panel B of Table 6 reports the results of the baseline regression that uses alternative measures of the cost of equity. Columns (1), (2), (3), (4) and (5) reports the results from using r_{gls}, r_{ct}, r_{oj}, r_{mpeg}, and *r_equity_comp*, respectively, as the proxies for the cost of equity capital. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in all regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

$$\begin{aligned} reputation\_comp, trade\_credit, orsales_t = {} & \alpha_0 + \alpha_1 TPA_t + \alpha_2 size_t + \alpha_3 soe_t + \alpha_4 age_t + \alpha_5 ROA_t + \alpha_6 leverage_t + \alpha_7 salesgrowth_t \\ & + \alpha_8 duality_t + \alpha_9 board\_indp_t + \alpha_{10} top1\_shares_t + \alpha_{11} operating\_cash_t + \alpha_{12} cash\_volatility_t \\ & + \alpha_{13} salaries_t + \alpha_{14} admin\_expense_t + \alpha_{15} ROA\_volatility_t + \alpha_{16} ab\_accrual_t + year\_dummies \\ & + industry\_dummies + \varepsilon_t \end{aligned} \tag{3}$$

$$\begin{aligned} r\_equity\_avg_t = {} & \alpha_0 + \alpha_1 reputation\_comp, trade\_credit, orsales_t + \alpha_2 size_t + \alpha_3 soe_t + \alpha_4 age_t + \alpha_5 ROA_t + \alpha_6 leverage_t \\ & + \alpha_7 salesgrowth_t + \alpha_8 duality_t + \alpha_9 board\_indp_t + \alpha_{10} top1\_shares_t + \alpha_{11} operating\_cash_t + \alpha_{12} cash\_volatility_t \\ & + \alpha_{13} salaries_t + \alpha_{14} admin\_expense_t + \alpha_{15} ROA\_volatility_t + \alpha_{16} ab\_accrual_t + year\_dummies + industry\_dummies + \varepsilon_t \end{aligned} \tag{4}$$

where the mediator variables are *reputation_comp*, *trade_credit*, and *sales*, which are defined in Appendix 3.[11] If the mediating effect exists, the coefficient on *TPA* in Equation (3) should be positive and statistically significant at a conventional level, while the coefficient of the mediator in Equation (4) should be significantly negative. Table 7 shows the results of the mechanism tests. The coefficients of *TPA* for the first-stage regressions and those of the mediators (*reputation_comp*, *trade_credit*, and *sales*) for the second-stage regressions are statistically significant at conventional levels with the predicted signs. Besides, we conduct an alternative two-step approach to test the mediation effects. The first-step regressions remain the same. In the second step, we regress *r_equity_avg* on the predicted values of mediators, which are estimated from the first-stage regressions. The results, not tabulated for brevity, are qualitatively the same as those in Table 7.[12] Collectively, our findings corroborate that the increased corporate reputation and trust are the underlying channels through which the firms' contributions to poverty alleviation reduce the cost of equity.

4.6. Cross-sectional analyses for the association between firms' contributions to poverty alleviation and the cost of equity

We further explore how our baseline results vary under different circumstances. State-owned firms play a significant role in

[11] Using *reputation_news* and *reputation_reward*, respectively, as the mediating variables for the mechanism tests, we obtain qualitatively the same results to support the notion that poverty alleviation reduces the cost of equity for a firm through enhancing its reputation.

[12] To ensure the robustness of results for the mediation effect, we also perform a Sobel-Goodman mediation test. The un-tabulated results indicate that the Sobel z statistics amount to −6.268, −7.182, and −5.055 for *reputation_comp*, *trade_credit*, and *sales*, respectively, and have p-values all lower than 0.01.

Table 7
Tests of the mechanisms through which corporate alleviation of poverty reduces the cost of equity.

Variables	(1) Dependent variable = *reputation_comp*$_t$	(2) Dependent variable = *r_equity_avg*$_t$	(3) Dependent vaiable = *trade_credit*$_t$	(4) Dependent variable = *r_equity_avg*$_t$	(5) Dependent variable = *sales*$_t$	(6) Depeenent variable = *r_equity_avg*$_t$
TPA$_t$	0.017***		0.014***		0.022***	
	(8.902)		(5.295)		(10.512)	
reputation_comp$_t$		−0.255***				
		(−4.989)				
trade_credit$_t$				−0.188***		
				(−5.397)		
sales$_t$						−0.151***
						(−3.315)
size$_t$	0.494***	0.004	0.998***	0.194***	0.931***	0.152**
	(33.153)	(0.069)	(46.085)	(3.174)	(63.276)	(2.206)
soe$_t$	0.033	0.211***	−0.041	0.160***	−0.051**	0.161***
	(1.459)	(3.030)	(−1.324)	(2.615)	(−2.269)	(2.638)
age$_t$	−0.128***	−0.137	−0.220***	−0.159	−0.066	−0.142
	(−3.012)	(−1.130)	(−3.872)	(−1.488)	(−1.461)	(−1.330)
ROA$_t$	0.634***	0.491	0.065	0.095	0.494***	0.179
	(5.298)	(0.747)	(0.397)	(0.170)	(4.156)	(0.320)
leverage$_t$	0.613***	3.396***	2.476***	3.702***	1.023***	3.368***
	(8.768)	(13.716)	(24.711)	(16.148)	(15.151)	(15.435)
salesgrowth$_t$	−0.037***	−0.218***	0.038***	−0.127***	−0.049***	−0.143***
	(−3.387)	(−5.208)	(3.071)	(−4.047)	(−5.232)	(−4.499)
duality$_t$	0.024	0.215***	−0.083***	0.207***	−0.080***	0.211***
	(1.152)	(3.130)	(−2.966)	(3.405)	(−3.906)	(3.470)
board_indp$_t$	0.624***	0.794	0.892***	0.621	0.905***	0.589
	(3.174)	(1.381)	(3.456)	(1.216)	(4.198)	(1.154)
top1_shares$_t$	0.147*	1.294***	−0.342***	1.089***	0.016	1.164***
	(1.738)	(5.311)	(−2.937)	(5.135)	(0.174)	(5.487)
operating_cash$_t$	1.428***	−3.668***	0.058	−2.745***	1.070***	−2.578***
	(8.734)	(−5.332)	(0.310)	(−5.763)	(8.141)	(−5.395)
cash_volatility$_t$	−1.185***	3.120***	−2.806***	2.134**	−0.018	2.683***
	(−4.053)	(3.041)	(−6.927)	(2.322)	(−0.062)	(2.952)
salaries$_t$	0.245***	0.111**	0.213***	0.075	0.336***	0.086*
	(12.209)	(1.992)	(8.194)	(1.516)	(16.768)	(1.720)
admin_expense$_t$	−0.063	−2.262***	−3.194***	−2.496***	−5.992***	−2.743***
	(−0.331)	(−3.345)	(−12.969)	(−4.761)	(−31.165)	(−4.951)
ROA_volatility$_t$	0.583***	−0.339	0.049	0.341	0.742***	0.366
	(3.211)	(−0.455)	(0.221)	(0.518)	(4.145)	(0.562)
ab_accrual$_t$	0.514***	−1.465***	−0.279***	−0.220	0.022	−0.167
	(5.193)	(−3.116)	(−6.210)	(−1.474)	(0.706)	(−1.113)
intercept	−14.895***	5.917***	−5.803***	5.706***	−4.064***	6.130***
	(−39.312)	(3.935)	(−11.274)	(5.114)	(−11.135)	(5.479)
Year-fixed effects	included	included	included	included	included	included
Industry-fixed effects	included	included	included	included	included	included
No. of obs.	7,883	7,883	7,883	7,883	7,883	7,883
Adj. R^2	0.486	0.207	0.703	0.236	0.788	0.233

Notes: Table 7 reports the results of using the conventional two-step mediation analysis to test the mechanisms through which firms' contributions to poverty alleviation reduce the equity capital. Columns (1) reports the results of the regression of corporate reputation (*reputation_comp*) on corporate alleviation of poverty (*TPA*). *reputation_comp* is a composite measure of the two proxies for reputation (i.e., *reputation_news* and *reputation_reward*), which is derived by using the principal component analysis. Column (2) reports the results of the baseline regression where the independent variable is replaced by *reputation_comp*. Column (3) reports the results of the regression of trade credits (*trade_credit*) on firms' contributions to poverty alleviation (*TPA*). Column (4) reports the results of the baseline regression that is augmented by *trade_credit* and excludes *TPA*. Column (5) reports the results of the regression of sales performance (*sales*) on corporate alleviation of poverty (*TPA*). Column (6) reports the results of the baseline regression that is augmented by *sales* and excludes *TPA*. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in all regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 8
Cross-sectional analysis of the association between corporate alleviation of poverty and the cost of equity.

Variables	Dependent variable = $r\_equity\_avg_t$							
	(1) Non-state owned	(2) State owned	(3) High financial health	(4) Low financial health	(5) High government subsidies	(6) Low government subsidies	(7) High advertising expense	Low-advertising expense
TPA_t	−0.018***	−0.012	−0.024***	−0.011	−0.014**	−0.011	−0.028***	−0.006
	(−3.169)	(−1.588)	(−3.784)	(−1.619)	(−2.546)	(−1.250)	(−4.074)	(−1.073)
$size_t$	0.008	0.059	0.064	−0.004	−0.255**	0.446***	0.151**	−0.107
	(0.142)	(0.682)	(1.131)	(−0.053)	(−2.457)	(5.972)	(2.352)	(−1.595)
soe_t	–	–	0.025	0.317***	0.240***	0.021	0.007	0.332***
	–	–	(0.339)	(3.356)	(3.009)	(0.236)	(0.082)	(3.967)
age_t	−0.042	−0.232	−0.100	−0.108	−0.068	−0.175	−0.071	−0.126
	(−0.327)	(−1.256)	(−0.767)	(−0.637)	(−0.488)	(−1.107)	(−0.509)	(−0.850)
ROA_t	0.551	−1.087	0.881	−1.219	−0.197	0.903	0.351	−0.084
	(0.838)	(−1.082)	(1.353)	(−1.194)	(−0.248)	(1.177)	(0.444)	(−0.111)
$leverage_t$	2.973***	3.590***	3.904***	2.358***	3.185***	3.244***	3.418***	2.872***
	(11.920)	(9.880)	(10.681)	(4.807)	(10.871)	(10.713)	(11.572)	(9.806)
$salesgrowth_t$	−0.130***	−0.174***	−0.152***	−0.135***	−0.152***	−0.132***	−0.122***	−0.140***
	(−3.526)	(−3.004)	(−3.213)	(−3.252)	(−3.515)	(−2.725)	(−2.922)	(−3.242)
$duality_t$	0.207***	0.171	0.189**	0.211**	0.175**	0.212**	0.223***	0.204**
	(2.949)	(1.439)	(2.557)	(2.134)	(2.071)	(2.571)	(2.758)	(2.450)
$board\_indp_t$	0.868	−0.290	−0.002	0.747	0.360	1.179	−0.065	0.784
	(1.517)	(−0.291)	(−0.004)	(1.015)	(0.559)	(1.535)	(−0.089)	(1.183)
$top1\_shares_t$	1.726***	0.177	1.101***	1.453***	1.506***	1.064***	0.861***	1.626***
	(6.856)	(0.500)	(4.126)	(4.643)	(5.689)	(3.109)	(2.592)	(5.843)
$operating\_cash_t$	−2.579***	−2.936***	−2.214***	−3.463***	−3.080***	−1.898***	−2.880***	−2.384***
	(−4.605)	(−3.281)	(−3.631)	(−4.597)	(−4.807)	(−2.690)	(−4.089)	(−3.725)
$cash\_volatility_t$	3.089***	1.146	1.665	3.159**	2.838***	2.993*	2.495*	2.191*
	(2.955)	(0.643)	(1.427)	(2.348)	(2.592)	(1.956)	(1.805)	(1.885)
$salaries_t$	0.024	0.030	−0.146**	0.167**	0.121**	−0.085	−0.050	0.061
	(0.417)	(0.352)	(−2.401)	(2.326)	(2.009)	(−1.112)	(−0.745)	(0.947)
$admin\_expense_t$	−1.554***	−2.715***	−1.459**	−2.412**	−3.312***	−1.157*	−1.211*	−6.467***
	(−2.654)	(−2.678)	(−2.457)	(−2.484)	(−3.731)	(−1.770)	(−1.870)	(−4.203)
$ROA\_volatility_t$	0.927	−1.583	3.015***	−1.304	−1.033	2.626**	3.074***	−1.303*
	(1.210)	(−1.272)	(3.116)	(−1.643)	(−1.287)	(2.562)	(2.875)	(−1.720)
$ab\_accrual_t$	−0.243	0.020	−0.085	−0.291	−0.233	−0.165	−0.207	−0.063
	(−1.256)	(0.087)	(−0.464)	(−1.114)	(−0.930)	(−0.893)	(−1.164)	(−0.251)
intercept	6.493***	6.846***	8.020***	5.595***	11.545***	−1.298	4.731***	9.293***
	(5.017)	(3.460)	(6.101)	(2.937)	(5.019)	(−0.691)	(3.122)	(6.198)
Year-fixed effects	included	included	included	included	included	included	included	included
Industry-fixed effects	included	included	included	included	included	included	included	included
No. of obs.	5,549	2,334	3,941	3,941	3,941	3,941	3,941	3,941
Adj. R^2	0.216	0.273	0.182	0.161	0.223	0.234	0.229	0.220

Note: Table 8 reports the results for the moderating effects of state ownership (*soe*), financial health (*operating_cash*), government subsidies (*subsidies*), and advertising spending (*advertising*) on the association between firms' contributions to poverty alleviation and the cost of equity. The baseline regression model is run based on the subsample comprising firms with low (high) values of moderating variables for enterprise ownership nature, financial health, government subsidies, and advertisement expenditures, respectively. Column (1) and Column (2) report the moderating effects of state ownership. Column (3) and Column (4) report the moderating effect of financial health. Column (5) and Column (6) report the moderating effect of government subsidies. Column (7) and Column (8) report the moderating effect of advertising spending. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in all regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

promoting the Chinese economy, bringing around 12 % of urban employment and 25 % of industrial income to the country.[13] These firms are considered not only as business companies earning economic profits but also as a vehicle to help the Chinese government increase social welfare (Lin et al., 1998; Wang et al., 2015; Chen et al., 2017; Chen et al., 2018). As investors believe that participating in poverty alleviation is a responsibility for state-owned firms and might not deserve substantive credits, the benefits for state-owned firms to engage in poverty alleviation might be lower than those for non-state-owned firms. In this regard, the negative association between corporate contribution to poverty alleviation and the cost of equity should be less pronounced for state-owned firms than non-state-owned firms.

[13] The information was obtained from the "2021 China Statistical Yearbook" (https://www.stats.gov.cn/tjsj/ ndsj/%202021/indexch.htm) on 6th December 2022.

Table 9
Multivariate test of the association between firms' contributions to poverty alleviation and the cost of debt.

Variables	Dependent variable = r_debt_t
TPA_t	−0.012***
	(−4.039)
$size_t$	0.050*
	(1.801)
soe_t	0.096**
	(2.478)
age_t	−0.098
	(−1.419)
ROA_t	−1.085***
	(−3.129)
$leverage_t$	2.231***
	(16.537)
$salesgrowth_t$	−0.102***
	(−4.956)
$board\_indp_t$	0.295
	(0.921)
$top1\_shares_t$	20.117
	(1.599)
$operating\_cash_t$	−1.512***
	(−5.227)
$cash\_volatility_t$	2.001***
	(3.548)
fixed_assets	−18.858
	(−1.501)
$ROA\_volatility_t$	0.066
	(0.172)
$ab\_accrual_t$	−0.081
	(−0.858)
intercept	4.044***
	(6.431)
Year-fixed effects	included
Industry-fixed effects	included
No. of obs.	8,004
Adj. R^2	0.240

Notes: Table 9 reports the OLS regression results for the association between firms' contributions to poverty alleviation (*TPA*) and the cost of debt (*r_debt*). The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in the regression, but their results are not reported for brevity. The values of variance inflation factor (VIF) for all the independent variables are below 5. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Firms that are financially healthy or granted financial subsidies by their local governments might bear lower financial risks for doing poverty alleviation, since these firms have abundant resources to invest in both poverty alleviation and value-adding investments or operations (Chan et al., 2017). Therefore, financial health and government subsidies are expected to strengthen the negative relationship between firms' contributions to poverty alleviation and the cost of equity.

Corporate advertising could raise customers' awareness of a firm and prompt the public to learn more about the firm's engagement in poverty alleviation (Servaes and Tamayo, 2013). As the degree of economic benefits from the contributions to poverty alleviation depends on how well this corporate deed is known to widespread stakeholders, firms with higher advertising expenses are likely to enjoy these benefits more. Thus, we expect that the contributions to poverty alleviation reduce the cost of equity more prominently for firms that incur higher advertising expenditures.

To test the foregoing moderating effects, we split our full sample into two subsamples based on whether the firm is state-owned (*soe*) and on the medians of financial health (*operating_cash*), government subsidies (*subsidies*), and advertising expenses (*advertising*), respectively. Then we run the baseline OLS regression (i.e., Model (1)) for each subsample. The definitions of the moderator variables are provided in Appendix 3. Table 8 shows the results of the moderation analysis. The coefficients on *TPA* are significantly negative for the subsamples of non-state-owned firms, firms with healthy financial conditions, firms receiving more government subsidies, and firms incurring high advertising expenses, whereas the coefficients on *TPA* for the other subsamples are not statistically significant. These results are thus consistent with our predictions.

Table 10
Tests of the mechanisms through which firms' contributions to poverty alleviation reduces the cost of debt.

Variables	(1) Dependent variable = $reputation\_comp_t$	(2) Dependent variable = r_debt_t	(3) Dependent vaiable = $trade\_credit_t$	(4) Dependent variable = r_debt_t	(5) Dependent variable = $sales_t$	(6) Dependent variable = r_debt_t
TPA_t	0.017***		0.014***		0.022***	
	(8.744)		(5.382)		(9.423)	
$reputation\_comp_t$		−0.166***				
		(−5.392)				
$trade\_credit_t$				−0.186***		
				(−8.721)		
$sales_t$						−0.097***
						(−3.766)
$size_t$	0.554***	0.080**	1.110***	0.266***	1.125***	0.164***
	(39.527)	(2.197)	(52.961)	(7.095)	(69.234)	(3.949)
soe_t	0.027	0.118***	−0.041	0.085**	−0.054**	0.088**
	(1.142)	(2.737)	(−1.280)	(2.240)	(−2.046)	(2.304)
age_t	−0.138***	−0.109	−0.237***	−0.115*	−0.092*	−0.095
	(−3.157)	(−1.433)	(−4.027)	(−1.722)	(−1.801)	(−1.398)
ROA_t	0.869***	−0.745*	0.638***	−1.015***	1.501***	−0.983***
	(7.203)	(−1.869)	(3.820)	(−2.908)	(10.120)	(−2.822)
$leverage_t$	0.626***	2.364***	2.653***	2.804***	1.374***	2.398***
	(8.833)	(15.278)	(25.923)	(19.060)	(16.897)	(17.130)
$salesgrowth_t$	−0.041***	−0.158***	0.021*	−0.093***	−0.079***	−0.106***
	(−3.660)	(−6.130)	(1.706)	(−4.561)	(−7.809)	(−5.089)
$board\_indp_t$	0.144**	−0.429***	0.221***	−0.357***	0.191***	−0.388***
	(2.565)	(−3.932)	(2.804)	(−3.706)	(2.901)	(−3.986)
$top1\_shares_t$	13.994	18.689	18.911	20.026	21.675	20.327
	(1.137)	(1.518)	(1.144)	(1.545)	(1.619)	(1.586)
$operating\_cash_t$	1.906***	−1.856***	0.768***	−1.385***	2.316***	−1.299***
	(11.965)	(−4.567)	(4.140)	(−4.809)	(15.100)	(−4.465)
$cash\_volatility_t$	−1.156***	1.944***	−2.280***	1.323**	0.892**	1.918***
	(−3.894)	(3.155)	(−5.469)	(2.356)	(2.556)	(3.425)
$fixed\_assets_t$	−14.000	−17.390	−19.327	−18.838	−21.765	−19.069
	(−1.138)	(−1.415)	(−1.169)	(−1.456)	(−1.625)	(−1.490)
$ROA\_volatility_t$	0.694***	−0.370	−0.115	0.045	0.309	0.018
	(3.753)	(−0.838)	(−0.504)	(0.115)	(1.437)	(0.047)
$ab\_accrual_t$	0.635***	−0.839***	−0.134***	−0.119	0.272***	−0.069
	(6.563)	(−3.052)	(−3.023)	(−1.272)	(7.026)	(−0.731)
intercept	−12.694***	4.520***	−5.664***	3.629***	−4.205***	4.427***
	(−39.835)	(5.578)	(−12.362)	(5.839)	(−11.422)	(7.054)
Year-fixed effects	included	included	included	included	included	included
Industry-fixed effects	included	included	included	included	included	included
No. of obs.	8,004	8,004	8,004	8,004	8,004	8,004
Adj. R^2	0.466	0.219	0.704	0.255	0.733	0.243

Notes: Table 10 reports the results of using the conventional two-step mediation analysis to test the mechanisms through which firms' contributions to poverty alleviation reduce the debt capital. Columns (1) reports the results of the regression of corporate reputation (*reputation_comp*) on corporate alleviation of poverty (*TPA*). *reputation_comp* is a composite measure of the two proxies for reputation (i.e., *reputation_news* and *reputation_reward*), which is derived by using the principal component analysis. Column (2) reports the results of the baseline regression where the independent variable is replaced by *reputation_comp*. Column (3) reports the results of the regression of trade credits (*trade_credit*) on firms' contributions to poverty alleviation (*TPA*). Column (4) reports the results of the baseline regression that is augmented by *trade_credit* and excludes *TPA*. Column (5) reports the results of the regression of sales performance (*sales*) on corporate alleviation of poverty (*TPA*). Column (6) reports the results of the baseline regression that is augmented by *sales* and excludes *TPA*. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in all regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

5. Research design and results for the tests of cost of debt

5.1. Baseline regression analyses and robustness check

We perform the following OLS regression to test whether the cost of debt of a firm is also affected by its contributions to poverty alleviation:

Table 11
Cross-sectional analysis of the association between corporate alleviation of poverty and the cost of debt.

Variables	Dependent variable = r_debt_t							
	(1) Non-state owned	(2) State owned	(3) High financial health	(4) Low financial health	(5) High government subsidies	(6) Low government subsidies	(7) High advertising expense	(8) Low advertising expense
TPA_t	−0.014***	−0.005	−0.018***	−0.003	−0.009**	−0.007	−0.018***	−0.004
	(−3.254)	(−0.902)	(−3.746)	(−0.600)	(−2.149)	(−1.069)	(−3.686)	(−0.888)
$size_t$	0.204***	0.204***	0.207***	0.145***	0.176***	0.409***	0.206***	0.214***
	(5.919)	(4.481)	(6.084)	(3.030)	(3.682)	(9.485)	(5.741)	(4.748)
soe_t	–	–	0.008	0.078	0.060	0.007	0.020	0.079
	–	–	(0.183)	(1.577)	(1.395)	(0.136)	(0.456)	(1.612)
age_t	0.032	−0.067	−0.009	0.002	0.071	−0.103	−0.042	0.025
	(0.423)	(−0.773)	(−0.120)	(0.022)	(0.931)	(−1.163)	(−0.537)	(0.292)
ROA_t	−0.981**	−1.013	−0.513	−2.019***	−0.948*	−0.788	−1.180**	−0.522
	(−2.062)	(−1.638)	(−1.058)	(−3.045)	(−1.767)	(−1.479)	(−2.232)	(−0.925)
$leverage_t$	2.038***	2.499***	3.537***	1.099***	2.161***	2.474***	2.545***	1.834***
	(13.424)	(12.318)	(15.895)	(3.939)	(12.181)	(14.257)	(15.576)	(9.818)
$salesgrowth_t$	−0.072***	−0.010	−0.082***	−0.035*	−0.048**	−0.062**	−0.054**	−0.043*
	(−3.198)	(−0.397)	(−2.787)	(−1.742)	(−2.160)	(−2.386)	(−2.142)	(−1.661)
$board\_indp_t$	0.222	0.218	0.334	0.185	0.006	0.740	0.027	0.450
	(0.611)	(0.401)	(0.824)	(0.418)	(0.016)	(1.546)	(0.064)	(1.031)
$top1\_shares_t$	4.879	75.823***	14.733	18.116	13.570	127.399**	57.320	16.153
	(0.594)	(4.363)	(0.750)	(1.349)	(1.217)	(2.299)	(1.469)	(1.378)
$operating\_cash_t$	−1.133***	−1.861***	−1.475***	−1.387***	−1.118***	−1.531***	−1.751***	−0.843**
	(−3.407)	(−4.216)	(−4.028)	(−3.471)	(−3.054)	(−3.789)	(−4.440)	(−2.257)
$cash\_volatility_t$	2.681***	2.595***	2.068***	2.973***	3.209***	2.219***	2.290***	3.110***
	(4.387)	(3.049)	(2.980)	(4.182)	(5.122)	(2.698)	(3.272)	(4.537)
$fixed\_assets_t$	−3.239	−74.437***	−13.196	−16.716	−11.974	−125.862**	−55.794	−14.636
	(−0.395)	(−4.294)	(−0.672)	(−1.247)	(−1.075)	(−2.272)	(−1.432)	(−1.250)
$ROA\_volatility_t$	−0.209	−0.062	0.178	−0.723**	−0.357	0.145	0.212	−0.617**
	(−0.789)	(−0.174)	(0.638)	(−2.249)	(−1.339)	(0.438)	(0.735)	(−1.995)
$ab\_accrual_t$	−0.050	−0.020	−0.017	−0.046	−0.005	−0.078	−0.113	0.154
	(−0.404)	(−0.135)	(−0.141)	(−0.281)	(−0.028)	(−0.690)	(−1.011)	(0.930)
intercept	0.165	0.349	−0.211	2.243**	0.682	−4.214***	0.252	−0.064
	(0.225)	(0.339)	(−0.285)	(2.105)	(0.650)	(−4.317)	(0.320)	(−0.066)
Year-fixed effects	included	included	included	included	included	included	included	included
Industry-fixed effects	included	included	included	included	included	included	included	included
No. of obs.	5,642	2,362	4,002	4,002	4,002	4,002	4,002	4,002
Adj. R^2	0.287	0.319	0.255	0.175	0.255	0.292	0.315	0.254

Note: Table 11 reports the results for the moderating effects of state ownership (*soe*), financial health (*operating_cash*), government subsidies (*subsidies*), and advertising spending (*advertising*), respectively, on the association between firms' contributions to poverty alleviation and the cost of debt. The baseline regression model is run based on the subsample comprising firms with low (high) values of moderating variables for enterprise ownership nature, financial health, government subsidies, and advertisement expenditures, respectively. Column (1) and Column (2) report the moderating effects of state ownership. Column (3) and Column (4) report the moderating effect of financial health. Column (5) and Column (6) report the moderating effect of government subsidies. Column (7) and Column (8) report the moderating effect of advertising spending. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in all regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

$$\begin{aligned} r\_debt_t = {} & \alpha_0 + \alpha_1 TPA_t + \alpha_2 size_t + \alpha_3 soe_t + \alpha_4 age_t + \alpha_5 ROA_t + \alpha_6 leverage_t + \alpha_7 salesgrowth_t + \alpha_8 board\_indp_t \\ & + \alpha_9 top1\_shares_t + \alpha_{10} operating\_cash_t + \alpha_{11} cash\_volatility_t + \alpha_{12} fixed\_assets_t + \alpha_{13} ROA\_volatility_t + \alpha_{14} ab\_accrual_t \\ & + year\_dummies + industry\_dummies + \varepsilon_t \end{aligned} \tag{5}$$

where the cost of debt (*r_debt*) is the dependent variable, and the firm's contribution to poverty alleviation (*TPA*) is the key independent variable. In line with previous research (Minton and Schrand, 1999; Anderson et al., 2004; Pittman and Fortin, 2004; Bharath et al., 2008; Schneider, 2011; Borisova et al., 2012; Chen and Gao, 2012; Valta, 2012; Gong et al., 2020), we include an array of control variables in the regression: firm size (*size*), state-owned property (*soe*), firm age (*age*), return on assets (*ROA*), financial leverage (*leverage*), sales growth (*salesgrowth*), board size (*board_indp*), the largest shareholder's stock holdings (*top1_shares*), financial health (*operating_cash*), cash flow volatility (*cash_volatility*), fixed assets (*fixed_assets*), the volatility of returns on assets (*ROA_volatility*), and abnormal accruals (*ab_accrual*). Year and industry dummies are also included in the regression. The summary statistics and correlation matrics for the variables used in Model (5) are reported in Web Appendix B - Table WB1.

Table 9 reports the regression results. The coefficient on *TPA* is negative and statistically significant at the 1 % level. A one-standard-deviation increase in *TPA* is associated with a decrease of 0.079 in *r_debt*, which accounts for 7.62 % of the one-standard-

deviation of *r_debt* for the full sample. These economically and statistically significant results suggest that the greater the firms contribute to poverty alleviation, the lower the cost of debt is. To facilitate causal inferences, we executive the same identification strategies as in Section 2, including the firm-fixed-effects regression, ITCV test, Oster test for coefficient stability, 2SLS regression analysis, two-stage treatment effect regression analysis, and difference-in-differences regression analysis. The results are reported in Web Appendix B - Tables WB2-WB7 and Figure WB1. They are both statistically and economically significant in supporting the negative causal impact of poverty alleviation on the cost of debt for firms. We also check the robustness of our results to alternative measurements on corporate contributions to poverty alleviation and on the cost of debt, and report the results in Web Appendix B - Table WB8. They are qualitatively the same as our baseline results.

5.2. Mechanism tests for the association between firms' contributions to poverty alleviation and the cost of debt

We further explore whether the firms' reputation and trust with their stakeholders mediate the association between firms' contributions to poverty alleviation and the cost of debt. To this end, we employ the following regressions:

$$\begin{aligned} reputation\_comp, trade\_credit, orsales_t = {} & \alpha_0 + \alpha_1 TPA_t + \alpha_2 size_t + \alpha_3 soe_t + \alpha_4 age_t + \alpha_5 ROA_t + \alpha_6 leverage_t + \alpha_7 salesgrowth_t \\ & + \alpha_8 board\_indp_t + \alpha_9 top1\_shares_t + \alpha_{10} operating\_cash_t \alpha_{11} cash\_volatility_t + \alpha_{12} fixed\_assets_t \\ & + \alpha_{13} ROA\_volatility_t + \alpha_{14} ab\_accrual_t + year\_dummies + industry\_dummies + \varepsilon_t \end{aligned} \tag{6}$$

$$\begin{aligned} r\_debt_t = {} & \alpha_0 + \alpha_1 reputation\_comp, trade\_credit, orsales_t + \alpha_2 size_t + \alpha_3 soe_t + \alpha_4 age_t + \alpha_5 ROA_t + \alpha_6 leverage_t + \alpha_7 salesgrowth_t \\ & + \alpha_8 board\_indp_t + \alpha_9 top1\_shares_t + \alpha_{10} operating\_cash_t + \alpha_{11} cash\_volatility_t + \alpha_{12} fixed\_assets_t + \alpha_{13} ROA\_volatility_t \\ & + \alpha_{14} ab\_accrual_t + year\_dummies + industry\_dummies + \varepsilon_t \end{aligned} \tag{7}$$

where the mediators are the composite measure of corporate reputation (*reputation_comp*), trade credits (*credit*), and sales (*sales*).[14] If the mediating effect exists, we will find a statistically significant and positive coefficient on *TPA* for Equation (6) and a significantly negative coefficient on the mediator variables for Equation (7). Table 10 reports the results. The coefficients on *TPA* and the mediators (*reputation_comp*, *trade_credit*, and *sales*) are statistically significant at conventional levels with the predicted signs. We also conduct an alternative mediation test, where the key independent variables in the second-stage regressions are replaced with the predicted values of mediators. The results from this test elicit the same inferences as do the results in Table 10, substantiating our supposition that the improved reputation and trust among stakeholders form the channel through which corporate contributions to poverty alleviation reduce the cost of debt.[15]

5.3. Cross-sectional analyses of the association between firms' contributions to poverty alleviation and the cost of debt

We also conduct cross-sectional analyses for the impact of firms' contributions to poverty alleviation on the cost of debt. We divide our full sample into two subsamples based on whether a firm is state-owned (*soe*) and on the medians of financial health (*operating_cash*), government subsidies (*subsidies*), and advertising expenses (*advertising*), respectively. We then run Model (5) for each subsample, and report the subsample regression results in Table 11. As with our results and inferences for the moderating effects on the cost of equity, the impact of corporate alleviation of poverty on the cost of debt is evident only for non-state-owned firms, firms with healthy financial conditions, firms receiving more government subsidies, and firms with high advertising expenses.

6. Conclusion

Eradicating poverty is the priority on the sustainable development agenda of the United Nations, World Bank as well as many governments around the globe. Listed firms play an essential role in contributing to the poverty alleviation campaign worldwide. The objective of our study is to examine whether the poverty alleviation by firms shapes the costs of their financing. Based on the data on Chinese listed companies and using a variety of rigorous identification strategies, we offer causal evidence that the contributions to poverty alleviation reduce both the cost of equity and the cost of debt for firms. We also find evidence to suggest that state-owned property, worse financial conditions, fewer subsidies from local governments, and less spending on advertisement weaken the effect of poverty alleviation on the cost of capital. Our mediating analyses further reveal that the poverty alleviation activities improve corporate reputation and stakeholder trust and thereby lower the cost of capital for firms.

Our findings have two important practical implications. Firstly, the implied benefits to a firm for participating in poverty alleviation rest largely on whether stakeholders would appreciate, recognize or support corporate involvement in reducing poverty. If stakeholders do so, firms with contributions to poverty alleviation will enjoy the benefits of reduced cost of capital as well as increased sales and trade credits, as suggested by our findings. Therefore, to encourage more contributions from firms to poverty alleviation,

[14] We utilize *reputation_news* and *reputation_reward*, respectively, as the mediator variables for separate mechanism tests, and get qualitatively the same results.

[15] We also conduct a Sobel-Goodman test for further robustness check. The Sobel Z statistics amount to −5.909, −5.506, and −4.578 for *reputation_comp*, *trade_credit*, and *sales*, respectively, with p-values all lower than 0.01. The results again corroborate the existence of the mediation effect.

governments and the media should actively promote the importance of poverty alleviation to a wide range of stakeholders and seek their understanding and support in the poverty alleviation campaign. Secondly, for an emerging market in China, investors are generally of lower sophistication, not least compared to Western investors, and tend to hold short-term investment horizons (e.g., Cheng et al., 2020). Yet, the Chinese investors still recognize and appreciate the firms' contributions to poverty alleviation, as evidenced by the lower cost of capital for these firms. In this regard, firms are encouraged to make greater contributions to poverty eradication for their countries to attain the sustainable development of economics and societies.

CRediT authorship contribution statement

Guanming He: Conceptualization, Methodology, Writing – review & editing, Supervision. **Zhichao Li:** Formal analysis, Investigation, Writing – original draft, Visualization. **Ling Yu:** Software, Validation, Formal analysis, Investigation, Data curation, Visualization. **Zhanqiang Zhou:** Conceptualization, Methodology, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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Appendix 1. Sample selection procedure

	No. of observations	No. of firms
Observations of the entire population of companies listed on the Shenzhen or Shanghai Stock Exchange for the period 2016–2020	18,009	4,016
Less: observations of firms labeled with ST, ST *, or PT	(838)	(192)
Less: observations of firms in the financial industry	(496)	(116)
Less: observations of firms cross-listed overseas	(46)	(11)
Less: observations of firms headquartered in the autonomous prefectures of the People's Republic of China	(83)	(18)
Less: observations of loss firms	(52)	(6)
Less: observations with missing values in regressors	(8,627)	(1,062)
Final sample	7,883	2,622

Appendix 2. Models used to estimate the cost of equity

Model 1. Gebhardt et al. (2001) model (GLS model)

Based on the clean surplus assumption (Ohlson, 1995), the GLS model assumes that the share price of a firm in a fiscal year t can be expressed by the forecasted returns on equity (*FROE*) and book values of equity as follows:

$$P_t = B_t + \sum_{i=1}^{11} \frac{FROE_{t+i} - r_{gls}}{(1+r_{gls})^i} B_{t+i-1} + \frac{FROE_{t+12} - r_{gls}}{r_{gls}(1+r_{gls})^i} B_{t+11} B_{t+i} = B_{t+i+1} + FEPS_{t+i}(1 - DPR_{t+i})$$

where r_{gls} is the cost of equity capital; P_t is the share price of a firm at the end of year t; B_{t+i} is the net assets, divided by the number of common shares outstanding at the end of year $t+i$; $FROE_{t+i}$ is the return on equity forecasted by analysts for year $t+i$; $FEPS_{t+i}$ is the earnings per share forecasted by analysts for year $t+i$; DPR_{t+i} is the dividend payout ratio forecasted by analysts for year $t+i$. The forecast period for the GLS model is 12 years, in which the data for the first three years are based on the analyst forecast data. After year $t+3$, *FROE* declines linearly to the industry-level return on earnings (*ROE*), which is estimated as a five-

(*continued on next page*)

(*continued*)

Model 1. Gebhardt et al. (2001) model (GLS model)

year moving average of the annual industry-median of *ROE*, till the 12th year. The dividend payout rate is fixed and is calculated based on the historical data of the last year.

Considering the availability of data on analyst forecasts in China, we follow Chen et al. (2009) to make the following adjustments to the model: (i) earnings in the third year are estimated based on the average earnings growth of the previous two years forecasted by analysts; (ii) the dividend per share forecasted by analysts is used for calculating the expected dividend payout ratio. If the data on analysts' dividend forecasts are missing, the dividend payout ratio of the previous year is utilized.

Model 2. Claus and Thomas (2001) model (CT model)

Under the clean surplus assumption, the CT model assumes that the share price of a firm in a fiscal year t can be expressed by the forecasted residual earnings and book values of equity as follows:

$$P_t = B_t + \sum_{i=1}^{5} \frac{AE_{t+i}}{(1+r_{ct})^i} + \frac{AE_{t+5}(1+g)}{(r_{ct}-g)(1+r_{ct})^5} AE_{t+i} = FEPS_{t+i} - r_{ct}B_{t+i-1} B_{t+i} = B_{t+i+1} + FEPS_{t+i}(1 - DPR_{t+i})$$

where r_{ct} is the cost of equity capital; P_t is the share price of a firm at the end of year t; B_{t+i} is the net assets, divided by the number of common shares outstanding at the end of year $t+i$; AE_{t+i} is the abnormal earnings per share for year $t+i$; $FEPS_{t+i}$ is the earnings per share forecasted by analysts for year $t+i$; DPR_{t+i} is the dividend payout ratio forecasted by analysts for year $t+i$; g is the growth rate of abnormal earnings. The forecast period for the CT model is 5 years. The earnings per share for the forecast period are computed based on the earnings growth rate and earnings of the previous year if the data on analyst earnings forecasts are missing. Beyond the forecast period, excess earnings are assumed to increase steadily at the sustainable growth rate g, which is estimated by using the inflation growth rate. Consistent with Claus and Thomas (2001), the dividend payout ratio is set to be 50 %.

Considering the availability of data on analyst forecasts, we make the same adjustment to the CT model as we do for the GLS model, and set the sustainable growth rate to be 3 %, based on the recent inflation rate in China and consistent with the related literature (Claus and Thomas, 2001; Hou et al., 2011).

Model 3. Ohlson and Juettner-Nauroth (2005) model (OJ model)

The OJ model assumes that the short-term growth rate of earnings will converge to the sustainable growth rate in the future. Under this assumption, the cost of equity is calculated as follows:

$$r_{oj} = A + \sqrt{A^2 + FEPS_{t+1}(g_2 - (\gamma - 1))/P_t}A = \frac{1}{2}((\gamma - 1) + \frac{DPS_{t+1}}{P_t})g_2 = \frac{FEPS_{t+2} - FEPS_{t+1}}{FEPS_{t+1}}$$

where r_{oj} is the cost of equity capital; P_t is the share price of a firm at the end of year t; $FEPS_{t+1}$ and $FEPS_{t+2}$ are the earnings per share which are forecasted by analysts for year $t+1$ and year $t+2$, respectively; DPS_{t+1} is the dividends per share which are forecasted by analysts for year $t+1$. If the data on analysts' dividends forecasts are missing, the dividends per share are calculated based on the dividend payout ratio for the previous year; γ is a constant term that equals one plus the long-term growth rate; and g_2 is the short-term growth rate of earnings per share. The sustainable growth rate is set at 3 %, according to the recent inflation growth rate in China and consistent with the related literature (Claus and Thomas, 2001; Hou et al., 2011).

Model 4. Easton model (2004)

The Easton model is a generalization of the Price-Earnings-Growth (PEG) model and is developed based on the OJ model (Ohlson and Juettner-Nauroth, 2005). Under the Easton model, the share price of a firm in a fiscal year can be expressed as a function of one-year ahead dividends per share, one-year-ahead earnings per share, and two-year-ahead earnings per share. The short-term forecast horizon is set to span a two-year period, beyond which the abnormal earnings will grow in perpetuity at a constant rate. The Easton model requires positive one-year-ahead earnings, positive two-year-ahead earnings, and positive growth in earnings, and estimates the cost of equity as follows:

$$r_{mpeg} = \sqrt{(EPS_{t+2} + r_{mpeg}DPS_{t+1} - EPS_{t+1})/P_t}$$

where r_{mpeg} is the cost of equity capital, P_t is the share price of a firm at the end of year t; EPS_{t+1} and EPS_{t+2} are earnings per share at the end of year $t+1$ and year $t+2$, respectively; DPS_{t+1} is dividends per share at the end of year $t+1$.

Appendix 3. Summary of variable definitions

Variables	Definitions
r_equity_avg	The average of four variables for the cost of equity, namely, r_{gls}, r_{ct}, r_{oj}, and r_{mpeg}, estimated from the models developed by Gebhardt et al. (2001), Claus and Thomas (2001), Ohlson and Juettner-Nauroth (2005), and Easton (2004), respectively.
r_{gls}	The cost of equity derived from the Gebhardt et al. (2001) model and multiplied by 100. This variable is defined in detail in Appendix 2.
r_{ct}	The cost of equity derived from the Claus and Thomas (2001) model and multiplied by 100. This variable is defined in detail in Appendix 2.
r_{oj}	The cost of equity derived from the Ohlson and Juettner-Nauroth (2005) model and multiplied by 100. This variable is defined in detail in Appendix 2.
r_{mpeg}	The cost of equity derived from the Easton (2004) model and multiplied by 100. This variable is defined in detail in Appendix 2.

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Variables	Definitions
r_equity_comp	A composite measure of the four proxies for the cost of equity (i.e., r_{gls}, r_{ct}, r_{oj}, and r_{mpeg}), which is derived by using the principal component analysis.
r_debt	The cost of debt which is calculated as the interest expenses for the year divided by the average of the opening balance and closing balance of the total debt in a fiscal year.
r_debt1	The cost of debt which is calculated as financial expenses for the year divided by the average of the opening balance and closing balance of the total debt in a fiscal year. Financial expenses include not only interest expenses but also related processing fees as well as any other expenditures incurred for debt financing.
TPA	The natural logarithm of the contributions, including both monetary and non-monetary donations, of a firm to poverty alleviation during a fiscal year.
TPA_dummy	1 if a firm contributes to poverty alleviation in a fiscal year, and 0 otherwise.
TPA_monetary	The natural logarithm of the monetary contributions of a firm to poverty alleviation during a fiscal year.
TPA_nonmonetary	The natural logarithm of the non-monetary contributions of a firm to poverty alleviation during a fiscal year.
Treat_TPA	1 if a firm contributes to poverty alleviation for at least one year during the period 2016–2018, and 0 otherwise.
Boardchair_Poverty1	The natural logarithm of the number of impoverished counties in the city, where the chairman/chairwoman was born, for a fiscal year.
Boardchair_Poverty2	The natural logarithm of the number of impoverished counties in the province, where the chairman/chairwoman was born, for a fiscal year.
Boardchair_Poverty3	The natural logarithm of the year-level average of annual GDP per capita of the province, where the chairman/chairwoman was born, for the period from his/her birth year to the age of 18.
Headquarter_Poverty1	The natural logarithm of the number of impoverished counties in the city, where the firm is headquartered, for a fiscal year.
Headquarter_Poverty2	The natural logarithm of the number of impoverished counties in the province, where the firm is headquartered, for a fiscal year.
Headquarter_Poverty3	The natural logarithm of the annual GDP per capita of the province, where the firm is headquartered, for a fiscal year.
reputation_news	The natural logarithm of the total number of positive media news about a firm in a fiscal year.
reputation_reward	The natural logarithm of the sum of the scores for the poverty alleviation awards (5 for a national award, 4 for a provincial award, 3 for a municipal award, 2 for a district or county award, 1 for a non-governmental award often conferred by a social group) won by a firm in a fiscal year. *Reputation_reward* equals 0 if a firm does not win any award for its poverty alleviation activities in a fiscal year.
reputation_comp	A composite measure of two proxies for reputation (i.e., *reputation_news* and *reputation_reward*), which is derived by using the principal component analysis.
trade_credit	The natural logarithm of accounts payable of a firm for a fiscal year.
sales	The natural logarithm of sales revenue of a firm for a fiscal year.
operating_cash	The operating cash flows of a firm for a fiscal year, divided by the total assets of the firm at the end of the fiscal year.
subsidies	The governmental subsidies granted to a firm for a fiscal year, divided by the total assets of the firm at the end of the fiscal year.
advertising	The advertising expense incurred by a firm for a fiscal year, divided by the total assets of the firm at the end of the fiscal year.
size	The natural logarithm of the total assets of a firm at the end of a fiscal year.
soe	1 if a firm is a state-owned enterprise (i.e., the firm of which the largest ultimate shareholder pertains to a government entity), and 0 otherwise.
age	The natural logarithm of the number of years since a firm's initial public offering.
ROA	The return on assets, which is calculated as the income before extraordinary items of a firm for a fiscal year, divided by the total assets of the firm at the end of the fiscal year.
leverage	The total debt of a firm, divided by the total assets of the firm, at the end of a fiscal year.
salesgrowth	The difference between the sales for the current fiscal year and the sales for the previous year, divided by the sales in the prior year.
duality	1 if the chairman/chairwoman of the board and the CEO of a firm are the same person for a fiscal year.
board_indp	The number of independent directors on the board of a firm, divided by the total number of directors at the end of a fiscal year.
top1_shares	The shareholding ratio of the largest shareholder of a firm for a fiscal year.
cash_volatility	The volatility of a firm's cash ratios, computed as the standard deviation of the ratios of cash to the total assets for the recent three fiscal years.
salaries	The natural logarithm of the total compensation of the top three executives of a firm for a fiscal year.
admin_expense	The administration expenses incurred by a firm during a fiscal year, divided by the operating income of the firm for the fiscal year.
ROA_volatility	The volatility of a firm's returns on assets, which is computed as the standard deviation of the firm's annual returns on assets, adjusted for the industry average, for the recent three fiscal years (Boubakri et al., 2011).
ab_accrual	The abnormal accruals of a firm for a fiscal year, which are estimated by using the modified Jones model (Dechow et al., 1995).
fixed_assets	The net value of fixed assets of a firm, divided by the total assets of the firm, at the end of a fiscal year.

Web Appendix A

In this web appendix, we offer results of the robustness tests of the association between firms' contributions to poverty alleviation and the cost of equity. Specifically, we check whether our baseline regression results are reasonably robust to correlated-omitted-variable(s) bias by doing a firm-fixed-effects regression analysis, analyzing the impact threshold for a confounding variable, and performing the Oster (2019) test for coefficient stability, respectively. We report the results for these tests in Tables WA1 – WA3.

Notes: Table WA1 reports the firm-fixed-effects regression results for the association between firms' contributions to poverty alleviation (*TPA*) and the cost of equity (*r_equity_avg*). The number of observations for the firm-fixed-effects regression is reduced compared to that for the baseline regression, since the observations with no time variance in the dependent variable are automatically dropped out by the regression estimator. Column (1) reports the results of the univariate regression that includes *TPA*. Column (2) reports the results of the multivariate regression that includes a range of control variables. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year × industry dummies and firm dummies are included in both regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

Notes: Table WA2 reports the results of the analysis of the impact threshold for a confounding variable (ITCV) for the regression results presented in Table 2. The calculation of ITCV is based on the previous study by Frank (2000). Column (1) reports the impact threshold for a confounding variable and the partial correlation between *TPA* and the confounding variable that makes the coefficient on *TPA* statistically insignificant at the 5 % level. Column (2) reports the minimum correlation a confounding variable must have between both *r_equity_avg* and *TPA* to make the coefficient on *TPA* statistically insignificant. Column (3) reports the partial Pearson correlation between *TPA* and each control variable. Column (4) reports the partial Pearson correlation between *r_equity_avg* and each control variable. Column (5) is the partial impact of each control variable, defined as the product of the correlation between *TPA* and the control variable and the correlation between *r_equity_avg* and the control variable. The definitions of all variables are provided in Appendix 3.

Notes: Table WA3 reports the results of Oster (2019) test for potential omitted variable (s) bias for the regression results presented in Table 2. The main variable of interest is *TPA*, and the dependent variable is *r_equity_avg*. The results based on a few multipliers (i.e., 1.25, 1.5, 1.8, and 2, respectively, used by Oster (2019) for R_{max} are presented. In addition, the result based on the extreme case of $R_{max} = 1$ is presented in the last row of the table.

Web Appendix B

In this web appendix, we offer supplementary results on the association between firms' contributions to poverty alleviation and the cost of debt. Specifically, we display the summary statistics and correlation matrix in Table WB1, check the robustness of our baseline findings on the cost of debt to potential endogeneity bias, and present the results for the robustness tests in Tables WB2 – WB8 and Figure WB1.

Table WB1: Univariate statistics.
Panel A: Summary statistics of variables.

Variables	N	Mean	Min.	10 %	25 %	Median	75 %	90 %	Max.	Std. dev
r_debt	8,004	6.077	0.003	4.567	6.100	6.001	6.904	7.822	10.692	1.030
r_debt1	8,004	9.622	0.019	5.935	7.458	9.304	11.264	13.621	23.224	3.125
TPA	8,004	4.169	0.000	0.000	0.000	1.653	12.101	14.979	18.516	6.542
TPA_dummy	8,004	0.295	0.000	0.000	0.000	1.000	1.000	1.000	1.000	0.456
TPA_monetary	8,004	4.016	0.000	0.000	0.000	1.038	11.625	14.771	25.486	6.465
TPA_nonmonetary	8,004	1.695	0.000	0.000	0.000	0.000	0.000	10.597	21.656	4.253
Boardchair_Poverty1	2,426	0.117	0.000	0.000	0.000	0.000	0.000	0.693	2.485	0.377
Boardchair_Poverty2	2,426	0.863	0.000	0.000	0.000	0.000	2.197	3.611	4.304	1.489
Boardchair_Poverty3	2,426	6.135	4.562	5.238	5.559	6.001	6.542	7.290	9.858	0.793
Headquarter_Poverty1	8,004	0.060	0.000	0.000	0.000	0.000	0.000	0.000	2.485	0.292
Headquarter_Poverty2	8,004	0.735	0.000	0.000	0.000	0.000	1.386	2.890	4.304	1.221
Headquarter_Poverty3	8,004	10.699	7.067	9.907	10.337	10.690	11.256	11.512	11.615	0.681
reputation_news	8,004	4.287	0.693	3.135	3.611	4.159	4.836	5.666	8.989	1.053
reputation_reward	8,004	3.469	0.000	0.000	0.000	0.692	2.562	3.059	3.962	0.151
reputation_comp	8,004	0.361	−2.477	−0.756	−0.286	0.245	0.896	1.649	4.564	0.966
trade_credit	8,004	20.159	12.312	18.190	19.024	20.036	21.188	22.316	26.943	1.684
sales	8,004	22.114	16.353	20.410	21.083	21.926	22.988	24.063	28.693	1.461
subsidies	8,004	0.008	0.000	0.001	0.002	0.005	0.009	0.018	0.167	0.010
advertising	8,004	0.013	−0.003	0.000	0.000	0.002	0.007	0.031	0.594	0.035
size	8,004	22.413	19.885	21.281	21.818	22.568	23.137	23.246	23.262	0.779
soe	8,004	0.295	0.000	0.000	0.000	0.000	1.000	1.000	1.000	0.456
age	8,004	2.955	2.197	2.565	2.773	2.996	3.178	3.296	3.584	0.280
ROA	8,004	0.056	−0.373	0.009	0.024	0.050	0.082	0.120	0.231	0.053
leverage	8,004	0.429	0.057	0.178	0.282	0.424	0.569	0.682	0.918	0.189
salesgrowth	8,004	0.379	−0.678	−0.135	0.004	0.158	0.440	0.980	9.631	0.903
board_indp	8,004	0.372	0.115	0.209	0.333	0.364	0.429	0.429	0.571	0.054
top1_shares	8,004	0.203	0.002	0.030	0.080	0.168	0.289	0.432	0.715	0.157
operating_cash	8,004	0.059	−0.168	−0.016	0.020	0.057	0.097	0.140	0.254	0.065
cash_volatility	8,004	0.039	0.002	0.010	0.018	0.030	0.050	0.077	0.234	0.032
fixed_assets	8,004	0.203	0.002	0.030	0.080	0.168	0.289	0.432	0.718	0.157
ROA_volatility	8,004	0.032	0.001	0.006	0.011	0.019	0.033	0.063	0.408	0.045
ab_accrual	8,004	−0.001	−1.945	−0.084	−0.033	0.009	0.050	0.101	0.277	0.152

Notes: Panel A of Table WB1 reports the descriptive statistics for all variables used in the multivariate tests of the association between firms' contributions to poverty alleviation and the cost of debt. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. The sample period ranges from 2016 to 2020. Observations that have missing values in any of the regressors are excluded from the samples used in the multivariate tests.

Notes: Panel B of Table WB1 provides the Spearman correlation coefficients for all variables involved in the baseline regression regarding the relationship between firms' contributions to poverty alleviation and the cost of debt. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. *, **, and *** indicate the two-tailed

statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

Notes: Table WB2 reports the firm-fixed-effects regression results for the association between firms' contributions to poverty alleviation (*TPA*) and the cost of debt (*r_debt*). The number of observations for the firm-fixed-effects regression is reduced relative to that of the OLS regression, since the observations with no time-series variance in the dependent variable are automatically dropped out by the regression estimator. Column (1) reports the results of the univariate regression on *TPA*. Column (2) reports the results of the multivariate regression that includes a range of control variables in addition to *TPA*. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year × industry dummies and firm dummies are included in both regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

Notes: Table WB3 reports the results of the impact threshold for a confounding variable (ITCV) test for the regression results presented in Table 9. The calculation of ITCV is based on the previous study by Frank (2000). Column (1) reports the impact threshold for a confounding variable and the partial correlation between *TPA* and the confounding variable that makes the coefficient on *TPA* statistically insignificant at the 5 % level. Column (2) reports the minimum correlation a confounding variable must have between both *r_debt* and *TPA* to make the coefficient on *TPA* statistically insignificant. Column (3) reports the partial Pearson correlation between *TPA* and each control variable. Column (4) reports the partial Pearson correlation between *r_debt* and each control variable. Column (5) is the partial impact of each control variable, defined as the product of the correlation between *TPA* and the control variable and the correlation between *r_debt* and the control variable. The definitions of all variables are provided in Appendix 3.

Notes: Table WB4 reports the results of Oster (2019) test for potential omitted variable (s) bias for the regression results presented in Table 9. The main variable of interest is *TPA*, and the dependent variable is *r_debt*.The results based on a few multipliers (i.e., 1.25, 1.5, 1.8, and 2, respectively, used by Oster (2019) for R_{max} are presented. The result based on the extreme case of $R_{max} = 1$ is presented in the last row of the table.

Notes: Panel A of Table WB5 presents the results of the two-stage least squares regression for the association between firms' contributions to poverty alleviation (*TPA*) and the cost of debt (*r_debt*). Columns (1) and (2) (Columns (3) and (4)) report the results from using *Boardchair_Poverty1*, *Boardchair_Poverty2,* and *Boardchair_Poverty3* (*Headquarter_Poverty1*, *Headquarter_Poverty2*, and *Headquarter_Poverty3*) as the instrumental variables. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in all regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

Notes: Table WB6 presents the results of two-stage treatment effect regression for the association between firms' contributions to poverty alleviation (*TPA_dummy*) and the cost of debt (*r_debt*). Columns (1) and (2) (Columns (3) and (4)) report the results from using *Boardchair_Poverty1*, *Boardchair_Poverty2*, and *Boardchair_Poverty3* (*Headquarter_Poverty1*, *Headquarter_Poverty2*, and *Headquarter_Poverty3*) as the instrumental variables. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in all regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. The p-values for Wald χ^2 are close to zero. *, **, and *** indicate the two-tailed statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

Table WB7: Control for endogeneity via difference-in-differences regression.

Panel A: Tests of covariate balance between treatment and control firms.

Variables	Matching statuses	No. of observations	No. of firms	Mean for treatment firms	Mean for control firms	Standardize bias (%)	t-stat
$size_t$	Unmatched	9,820	2,666	22.4180	21.9700	55.3	26.54***
	Matched	8,873	2,393	22.4170	22.4060	1.4	0.66
ROA_t	Unmatched	9,820	2,666	0.0539	0.0603	−12.5	−6.04***
	Matched	8,873	2,393	0.0540	0.0532	1.5	0.69
$salesgrowth_t$	Unmatched	9,820	2,666	0.3614	0.4673	−9.8	−4.68***
	Matched	8,873	2,393	0.3614	0.3531	0.8	0.38
$leverage_t$	Unmatched	9,820	2,666	0.4598	0.3884	36.4	17.70***
	Matched	8,873	2,393	0.4596	0.4654	−2.9	−1.29
$board\_indp_t$	Unmatched	9,820	2,666	0.3758	0.3748	1.8	0.88
	Matched	8,873	2,393	0.3757	0.3767	−1.7	−0.72
$operating\_cash_t$	Unmatched	9,820	2,666	0.0563	0.0460	15.8	7.63***
	Matched	8,873	2,393	0.0562	0.0563	−0.2	−0.09
$ROA\_volatility_t$	Unmatched	9,820	2,666	0.0394	0.0433	−5.5	−2.63***
	Matched	8,873	2,393	0.0393	0.0377	2.3	1.09

Notes: Panel A of Table WB7 reports the results from testing the covariate balance between the treatment firms and control firms for the difference-in-differences regression of the cost of debt. The sample period ranges from 2013 to 2018. The regression run for propensity-score matching involves 9,820 firm-year observations. We use seven covariates - *size*, *ROA*, *salesgrowth*, *leverage*, *board_indp*,

operating_cash, and *ROA_volatility*. The definitions of all variables are provided in Appendix 3. The treatment indicator variable, *Treat_TPA* equals 1 if a firm contributes to the poverty alleviation for at least one year during the period 2016–2018, and 0 otherwise. We match each treatment firm (i.e., the firm involves in the poverty alleviation for at least one year) with a control firm (i.e., the firm that does not participate in the poverty alleviation), with replacement, by using the closest propensity score within a caliper of 1 %. For both the unmatched and matched samples, the t-statistics from the two-sample tests of mean and the standardized bias are calculated to check the covariate balance between the treatment group (*Treat_TPA* = 1) and control group (*Treat_TPA* = 0). Year and industry dummies are included in all the regressions, but their results are not reported for brevity. The t-statistics are based on robust standard errors. *, **, and *** indicate the two-tailed statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

Panel B: Tests of the parallel trends assumption by using alternative pre- and post-event years.

Variables	Dependent variable = r_debt_t		
	(1) 2012 vs. 2013	(2) 2013 vs. 2014	(3) 2014 vs. 2015
*Post*Treat_TPA*	−0.089	−0.147	−0.021
	(−1.259)	(−0.122)	(−0.320)
$size_t$	0.222***	0.156***	0.379***
	(3.918)	(2.793)	(7.705)
soe_t	−0.014	0.143**	−0.040
	(−0.221)	(2.222)	(−0.623)
age_t	0.144	−0.009	−0.046
	(1.539)	(−0.096)	(−0.468)
ROA_t	−1.433	−1.158	−2.773***
	(−1.572)	(−1.214)	(−3.636)
$leverage_t$	2.616***	2.325***	1.791***
	(10.589)	(9.651)	(8.369)
$salesgrowth_t$	−0.027	0.070**	−0.069**
	(−1.012)	(2.111)	(−2.325)
$board\_indp_t$	−0.228	−0.340*	−0.425***
	(−1.260)	(-1.946)	(−2.707)
$top1\_shares_t$	2.451***	−263.512*	29.729
	(10.353)	(−1.747)	(0.195)
$operating\_cash_t$	−2.727***	−0.220	−0.701
	(−3.426)	(−0.254)	(−1.043)
$cash\_volatility_t$	2.723***	2.571***	4.962***
	(2.973)	(2.687)	(5.486)
$fixed\_assets_t$	2.125	7.436***	1.163
	(1.343)	(4.848)	(0.872)
$ROA\_volatility_t$	0.176	−0.138	−0.671**
	(0.525)	(−0.405)	(-82.003)
$ab\_accrual_t$	−0.933	0.576	0.559
	(−1.564)	(0.913)	(1.288)
intercept	0.022	1.908	−2.739***
	(0.019)	(1.637)	(−2.607)
Industry-fixed effects	included	included	included
No. of obs.	0.414	0.267	0.297
Adj. R^2	1,245	1,379	1,461

Notes: Panel B of Table WB7 reports the multivariate tests of parallel trends assumption by using alterantive pre- and post-event years before the year 2016 for the DID tests. The treatment indicator variable, *Treat_TPA*, equals 1 if a firm contributes to poverty alleviation for at least one year during the period 2016–2018, and 0 otherwise. *Post* is the time indicator variable that equals 1 (0) if the firm is in the alternative post-event year (pre-event year). The interaction term, *Post*Treat_TPA*, captures the impact of poverty alleviation on the cost of debt. Columns (1), (2), and (3) present the results from using 2012 and 2013, 2013 and 2014 or 2014 and 2015 as pre- and post-event periods, respectively, for the DID estimation. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3.

Panel C: Multivariate test of the parallel trends assumption by interacting year dummies with the treatment variable.

Variables	Dependent variable = r_debt_t
*Pre3*Treat_TPA*	−0.026
	(−0.487)
*Pre2*Treat_TPA*	−0.101
	(−1.236)

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Variables	Dependent variable = r_debt_t
*Pre1*Treat_TPA*	−0.017
	(−0.277)
*Post1*Treat_TPA*	−0.226***
	(−6.081)
*Post2*Treat_TPA*	−0.211**
	(−2.020)
*Post3*Treat_TPA*	−0.303***
	(−5.827)
$size_t$	0.210***
	(6.292)
soe_t	0.046
	(0.990)
age_t	−0.003
	(−0.048)
ROA_t	−0.942**
	(−2.050)
$leverage_t$	2.159***
	(17.732)
$salesgrowth_t$	−0.051
	(−1.185)
$board\_indp_t$	0.260
	(1.261)
$top1\_shares_t$	20.194
	(1.828)
$operating\_cash_t$	−1.370***
	(−3.567)
$cash\_volatility_t$	2.639***
	(3.776)
$fixed\_assets_t$	−18.663
	(-1.677)
$ROA\_volatility_t$	−0.178
	(−1.370)
$ab\_accrual_t$	−0.039
	(−0.762)
intercept	0.114
	(0.140)
Year-fixed effects	included
Industry-fixed effects	included
No. of obs.	8,873
Adj. R^2	0.301

Notes: Panel C of Table WB7 presents results for the multivariate test of parallel trends assumption for the difference-in-differences regression of the cost of debt. The test is done based on the difference-in-differences regression model that substitutes *Post***Treat_TPA* for the interaction terms between year dummies and the treatment indicator variable (*Treat_TPA*). The treatment indicator variable, *Treat_TPA*, equals 1 if a firm contributes to poverty alleviation for at least one year during the period 2016–2018, and 0 otherwise. *Pre3*, *Pre2*, *Pre1*, *Post1*, *Post2*, and *Post3* are year dummies for the years 2013, 2014, 2015, 2016, 2017, and 2018, respectively. For instance, *Pre3* equals 1 if the observation is for the year 2013, and 0 otherwise. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in the regression, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate two-tailed statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

Panel D: Difference-in-differences regression of the cost of debt.

Variables	Dependent variable = r_debt_t	Dependent variable = r_debt_t	Dependent variable = r_debt_t
*Post*Treat_TPA*	−0.180***	−0.201***	−0.128***
	(−3.700)	(−4.567)	(−2.690)
Treat_TPA	−0.028	−0.021	
	(−0.574)	(-0.421)	
Post		0.131***	
		(3.862)	
$size_t$	0.205***	0.190***	0.404***
	(7.190)	(6.725)	(6.632)
soe_t	0.046	0.075**	−0.012

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(*continued*)

Variables	Dependent variable = r_debt_t	Dependent variable = r_debt_t	Dependent variable = r_debt_t
	(1.367)	(2.197)	(−0.288)
age_t	−0.006	−0.014	1.060***
	(−0.095)	(−0.230)	(2.857)
ROA_t	−0.950**	−0.016	−0.856*
	(−2.494)	(−0.040)	(−1.948)
$leverage_t$	2.165***	2.360***	2.018***
	(17.266)	(18.639)	(10.716)
$salesgrowth_t$	−0.046**	−0.063***	−0.031**
	(−2.578)	(−3.477)	(−2.140)
$board\_indp_t$	0.244	0.190	−0.060
	(0.793)	(0.607)	(−0.157)
$top1\_shares_t$	19.474	21.815	8.160
	(1.503)	(1.297)	(0.903)
$operating\_cash_t$	−1.377***	−1.345***	0.108
	(−5.167)	(-4.835)	(0.376)
$cash\_volatility_t$	2.646***	2.615***	0.534
	(5.235)	(5.013)	(0.942)
$fixed\_assets_t$	−17.951	−20.278	−6.604
	(−1.386)	(−1.206)	(−0.731)
$ROA\_volatility_t$	−0.174	0.112	0.263
	(−0.827)	(0.514)	(1.112)
$ab\_accrual_t$	−0.031	0.213**	−0.068
	(−0.337)	(2.236)	(−0.854)
intercept	0.229	0.363	−7.079***
	(0.369)	(0.596)	(−4.495)
Year-fixed effects	included	excluded	excluded
Industry-fixed effects	included	included	excluded
Year × industry-fixed effects	excluded	excluded	included
Firm-fixed effects	excluded	excluded	included
No. of obs.	8,876	8,876	8,485
Adj. R^2	0.300	0.239	0.672

Notes: Panel D of Table WB7 reports the regression results of the difference-in-differences (DID) model as to the cost of debt. The sample period ranges from 2013 to 2018. The treatment indicator variable, *Treat_TPA*, equals 1 if a firm contributes to poverty alleviation for at least one year during the period 2013–2018 and 0 otherwise. *Post* is the time indicator variable that equals 1 (0) if the firm is in the period of 2016–2018 (2013–2015). The interaction term, *Post*Treat_TPA*, captures the impact of poverty alleviation on the cost of debt, *r_debt*. Column (1) reports the OLS regression results of the DID model that includes *Treat_TPA*, year dummies, industry dummies, among others. Column (2) reports the OLS regression results of the DID model that includes *Treat_TPA*, *Post*, and industry dummies, among others. Column (3) reports the firm-fixed-effects regression results of the DID model that includes the year × industry dummies, firm dummies, among others, and excludes *Treat_TPA* and *Post*. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

Table WB8: Robustness tests using alternative variable measurements.
Panel A: Alternative measures of firms' contributions to poverty alleviation.

Variables	(1) Dependent variable = r_debt_t	(2) Dependent variable = r_debt_t	(3) Dependent variable = r_debt_t
TPA_dummy_t	−0.163***		
	(−4.004)		
$TPA\_monetary_t$		−0.011***	
		(−3.876)	
$TPA\_nonmonetary_t$			−0.019***
			(-4.346)
$size_t$	0.048*	0.049*	0.047*
	(1.709)	(1.753)	(1.689)
soe_t	0.095**	0.096**	0.088**
	(2.460)	(2.481)	(2.270)
age_t	−0.096	−0.099	−0.108
	(−1.392)	(−1.435)	(-1.576)
ROA_t	−1.100***	−1.080***	−1.113***
	(−3.174)	(-3.111)	(−3.217)
$leverage_t$	2.226***	2.230***	2.227***
	(16.508)	(16.525)	(16.563)

(*continued on next page*)

(*continued*)

Variables	(1) Dependent variable = r_debt_t	(2) Dependent variable = r_debt_t	(3) Dependent variable = r_debt_t
$salesgrowth_t$	−0.102***	−0.102***	−0.103***
	(−4.952)	(−4.942)	(−5.007)
$board\_indp_t$	0.283	0.294	0.307
	(0.883)	(0.916)	(0.953)
$top1\_shares_t$	20.304	20.005	19.921
	(1.609)	(1.593)	(1.595)
$operating\_cash_t$	−1.517***	−1.517***	−1.528***
	(−5.246)	(−5.249)	(−5.289)
$cash\_volatility_t$	2.013***	2.011***	2.021***
	(3.568)	(3.568)	(3.573)
$fixed\_assets_t$	−19.051	−18.749	−18.692
	(−1.512)	(−1.495)	(−1.499)
$ROA\_volatility_t$	0.066	0.062	0.120
	(0.171)	(0.160)	(0.309)
$ab\_accrual_t$	−0.081	−0.083	−0.087
	(−0.851)	(−0.874)	(−0.913)
intercept	4.109***	4.073***	4.141***
	(6.565)	(6.463)	(6.635)
Year-fixed effects	included	included	included
Industry-fixed effects	included	included	included
No. of obs.	8,004	8,004	8,004
Adj. R^2	0.240	0.240	0.241

Notes: Panel A of Table WB8 reports the results of the relationship between firms' contributions to poverty alleviation and the cost of debt, the former of which is measured by alternative variables. In specific, Columns (1), (2), and (3) report the results from using *TPA_dummy*, *TPA_monetary*, and *TPA_nonmonetary*, respectively, as the alternative proxies for firms' contributions to poverty alleviation. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in all regressions, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

Panel B: Alternative measures of the cost of debt.

Variables	Dependent variable = r_debt1_t
TPA_t	−0.016**
	(−2.294)
$size_t$	−0.050
	(−0.771)
soe_t	0.295***
	(3.311)
age_t	−0.195
	(−1.260)
ROA_t	4.327***
	(5.320)
$leverage_t$	3.282***
	(10.952)
$salesgrowth_t$	−0.148***
	(−3.277)
$board\_indp_t$	0.897
	(1.206)
$top1\_shares_t$	35.516
	(1.238)
$operating\_cash_t$	−2.647***
	(−3.880)
$cash\_volatility_t$	4.163***
	(3.076)
$fixed\_assets_t$	−35.586
	(−1.242)
$ROA\_volatility_t$	−0.355
	(−0.357)
$ab\_accrual_t$	−0.210
	(−1.029)
intercept	9.385***
	(6.487)
Year-fixed effects	included

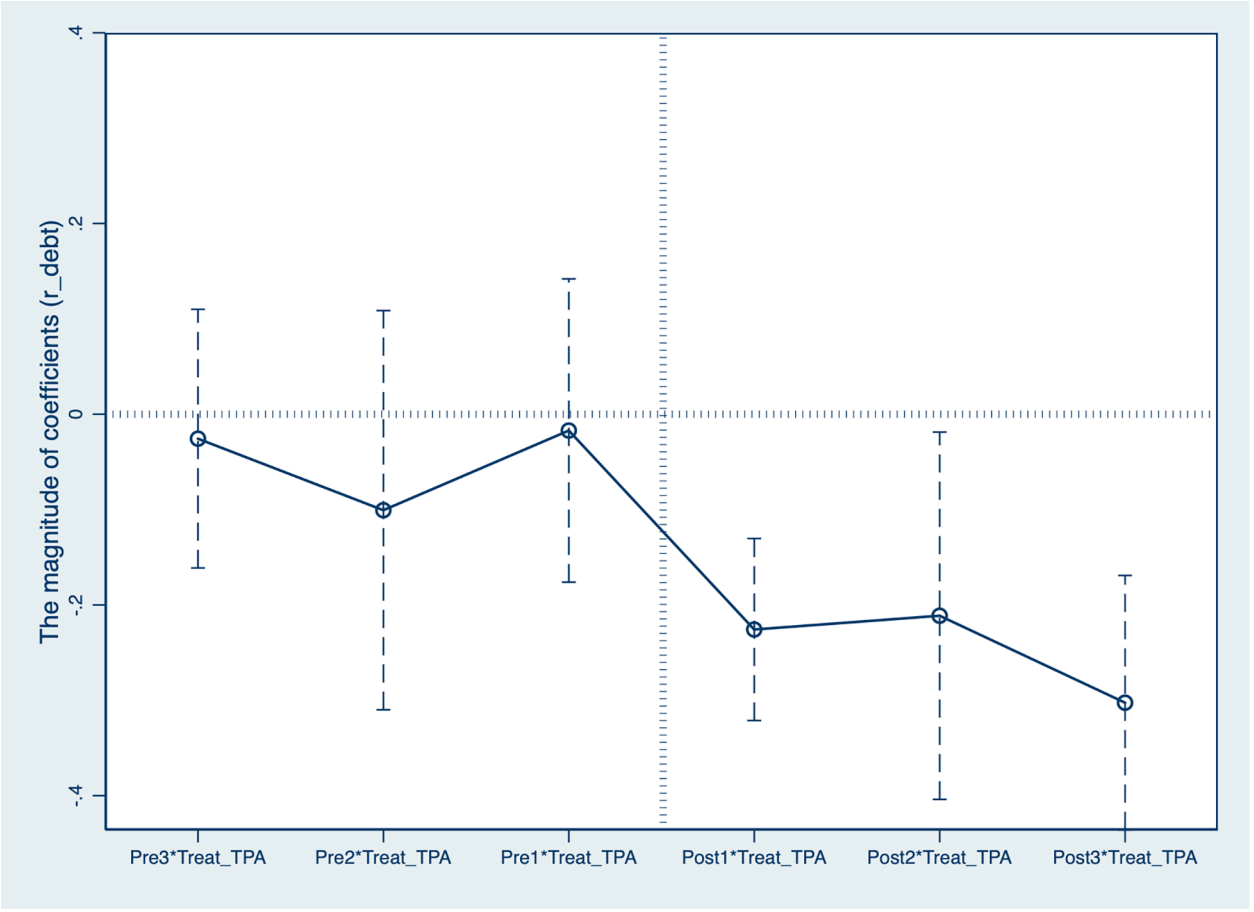
(*continued on next page*)

(*continued*)

Variables	Dependent variable = r_debt1_t
Industry-fixed effects	included
No. of obs.	8,004
Adj. R^2	0.184

Notes: Panel B of Table WB8 reports the results of the relationship between firms' contributions to poverty alleviation and the cost of debt measured by an alternative variable *r_debt1*. The sample period ranges from 2016 to 2020. All the continuous variables are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in the regression, but their results are not reported for brevity. The t-statistics in parentheses are based on robust standard errors clustered by firm. *, **, and *** indicate the two-tailed statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

Figure WB1: Grapical presentation of the multivariate test of parallel trend assumption for the DID regression of cost of debt.



Notes: Figure WB1 provides a graphical presentation of the results reported in Panel C of Table WB7, which pertain to the coefficient test of the parallel trends assumption for the difference-in-differences regression estimation on the association between firms' contributions to poverty alleviation and the cost of debt (*r_debt*). The horizontal axis represents the interaction terms between *Pre** (*Post**) and *Treat_TPA*; the vertical axis represents the magnitude of the coefficient of interaction terms between *Pre** (*Post**) and *Treat_TPA* and the corresponding 95 % confidence interval. *Treat_TPA* equals 1 if a firm contributes to poverty alleviation for at least one year for the period 2016–2018, and 0 otherwise. *Pre3*, *Pre2*, *Pre1*, *Post1*, *Post2*, and *Post3* are year dummies for the years 2013, 2014, 2015, 2016, 2017, and 2018, respectively. For instance, *Pre3* equals 1 if the observation is for the year 2013, and 0 otherwise. All the continuous variables used in the multivariate tests are winsorized at the 1 and 99 percentage points, respectively, and are defined in Appendix 3. Year and industry dummies are included in the regression, but their results are not reported for brevity.

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