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What drives the efficiency of corporate social responsibility activities? Evidence from targeted poverty alleviation projects

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Abstract

Purpose – To investigate the efficiency of a specific corporate social responsibility (CSR) activity using a unique setting in China that provides both the input and outcome of the CSR activity.

Design/methodology/approach – We use the archival methodology to examine factors that affect the association between the number of people lifted out of poverty by targeted poverty alleviation (TPA) projects and the expenditure on those projects. This unique seting provides both the input and output of a specific corporate social responsibility (CSR) activity, allowing us to examine its efficiency from a firm-level perspective within a top-down policy context.

Findings – We find that while firms under greater political pressure spend more on TPA, they are less efficient in lifting people out of poverty. The results hold after controlling for the difficulty of the TPA projects. In addition, firms required to issue CSR reports and firms more efficient in their business operations manage their TPA projects more efficiently.

Research limitations/implications – The study uses data from China, where the government plays a central role in economic and social policy. Thus, our findings on political pressure might not directly apply to other institutional contexts. Our analysis is limited to TPA projects with measurable outputs, excluding those that provide significant social benefits but lack measurable and comparable outputs (e.g. education). Also, firms do not consistently disclose the locations of their TPA projects, which limits our ability to control local macroeconomic factors.

Practical implications – Our findings reveal decreased efficiency when firms are compelled to undertake CSR initiatives. Rather than urging expenditure on CSR, stakeholders should prioritize CSR outcomes and devise

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alternative mechanisms to foster voluntary participation. Our results suggest that current global initiatives to mandate sustainability reporting have the potential to promote efficient CSR practices.

Social implications – Our findings could help stakeholders make more informed CSR decisions, leading to enhanced social outcomes at a reduced cost. Our paper has significant policy implications, highlighting the role of business enterprises in fulfilling social goals.

Originality/value – We provide the first evidence on the efficiency of an individual CSR activity using firm-level data. Compared to papers on CSR's financial outcomes, research on the social outcomes of CSR activities is limited. By examining the efficiency with which a CSR activity achieves its stated social goal, we expand the CSR research to meet the demands of a broader set of stakeholders.

Keywords Corporate social responsibility, Corporate social performance, CSR efficiency, Poverty alleviation, CSR disclosure

Paper type Research article

1. Introduction

Despite extensive research on corporate social responsibility (CSR), we know little about the efficiencies of specific CSR activities, i.e. the relationships between inputs and outputs (social outcomes). Few papers study this issue because we lack accurate measures of CSR activities' inputs and outputs, and it is difficult to establish direct links between the inputs and outputs (e.g. Barnea & Rubin, 2010; Brammer & Millington, 2008; Moser & Martin, 2012; Chatterji, Durand, Levine, & Touboul, 2016; Huang & Watson, 2015).

In this paper, we overcome the above problems by examining Chinese firms' participation in targeted poverty alleviation (TPA) projects. Poverty elimination is the No. 1 goal in the United Nations' (UN) 2030 Sustainable Development Goals (SDG). In the battle against poverty, China adopted a TPA strategy, requesting the development of poverty alleviation projects based on the specific characteristics of each poverty-stricken village. Since 2016, China's stock exchanges have been requiring public firms to disclose in annual reports their expenditures on TPA projects and the number of people lifted out of poverty as a result (please see Appendix 1 for an example). This unique setting not only provides accurate measures of the input (expenditures) and output (number of people lifted out of poverty) of a particular CSR activity, but also directly links the output to the input, allowing us to examine its efficiency [1]. Importantly, we examine these firm-level outcomes within the broader institutional environment of state-led poverty reduction, where firms face varying levels of external pressure to engage in CSR. Our goal is to understand how firm characteristics and institutional pressures shape the efficiency of CSR implementation and not to evaluate the overall effectiveness of national poverty policy.

Unlike most CSR studies, which examine the impacts of CSR activities on firms' financial performance, our focus is on the social outcomes of CSR, an underexplored area with substantial practical implications (Wang, Gibson, & Zander, 2020). In doing so, we answer to the call for accounting researchers to take a broader perspective and address new CSR questions involving non-shareholder constituents (Moser & Martin, 2012), while also contributing to the realization of the SDGs (Bebbington & Unerman, 2018). From an accounting perspective, understanding the input-output relationship of a CSR activity is important because "a fundamental role of accounting is to measure the costs and benefits of organizational decisions" (Balakrishnan, Sprinkle, & Williamson, 2011, p. 1888). Our study offers guidance to firms on how to effectively communicate their economic, environmental and social impacts, as required by the Global Reporting Initiative (Wang *et al.*, 2020). In addition, our findings could help regulators, firms and other stakeholders make more informed decisions when allocating CSR resources.

Public companies are required to classify their TPA projects into nine categories, including industrial development, transfer employment (e.g. providing vocational training to people in poverty), relocation (i.e. moving people out of poverty-stricken areas), education, health care, ecological protection, minimum social welfare, social assistance (e.g. donating to charities) and others. To examine the efficiency of TPA projects, we focus only on the industrial development category (henceforth ID-TPA). First, this type of TPA project involves building plants/business

enterprises that could directly lift people out of poverty [2], allowing us to link TPA expenditures (the input) to the number of people being lifted out of poverty (the output). Other types of TPA projects, such as health care and education, provide important social services but often lack consistent firm-level reporting of quantifiable and comparable outcomes [3]. Second, companies' business experience and expertise give them an advantage over other members of society in ID-TPA projects. Industrial development is also recognized as the most widely adopted TPA strategy among public companies and accounts for the largest share of their financial contributions. Understanding how efficiently companies lift people out of poverty through industrial development can help improve the overall efficiency of poverty alleviation efforts.

Since we can only examine CSR efficiency for firms participating in the ID-TPA projects, we use a two-stage Heckman selection model (Heckman, 1979) to control for the sample-selection bias. In the first stage, we predict firms' propensity to engage in ID-TPA projects. In the second stage, we investigate the relationship between the number of people lifted out of poverty and the expenditures on ID-TPA projects after controlling for the inverse Mills ratio from the first-stage regression.

We find that although political pressure increases firms' participation in ID-TPA projects, it weakens the input-output relation of these projects, i.e. firms facing greater political pressure lift fewer people out of poverty relative to their expenditure. This finding highlights the limits of compliance-driven CSR, where participation is shaped by external expectations rather than internal efficiency incentives. These results hold after controlling for the difficulty of ID-TPA projects, using a subsample of firms that voluntarily disclosed project locations, which allowed us to construct a measure of project accessibility as a proxy for implementation difficulty. These findings suggest that when firms engage in CSR activities primarily to curry favor with the government or avoid potential sanctions, they have limited incentive to manage these initiatives efficiently.

Firm visibility, measured by advertising intensity and analyst coverage, has no impact on their participation in the ID-TPA projects nor the efficiency of these projects. This is consistent with prior findings that economic considerations are not the main factors driving CSR among Chinese firms (e.g. Chen, Hung, & Wang, 2018).

Firms required to issue CSR reports [4] are more likely to contribute to ID-TPA projects and manage these projects more efficiently. The results hold after we control for firms' size and corporate governance, factors associated with the CSR reporting mandate. To mitigate the concern that firms are not randomly assigned to mandatory CSR reporting, we further validate our findings using a propensity-score-matched (PSM) sample. These results support the view that CSR mandates, by enhancing transparency and stakeholder monitoring (Marquis & Qian, 2014; Wang, Huang, Lee, & Petaibanlue, 2021), may promote more outcome-focused implementation of CSR activities. Moreover, firms tend to expand their CSR activities following the mandatory reporting requirement (Chen *et al.*, 2018; Fiechter, Hitz, & Lehmann, 2022), gaining experience that can be leveraged to improve the efficiency of their ID-TPA projects.

Lastly, firms that manage their own business more efficiently, as reflected in return on assets (ROA), are also more efficient in managing their ID-TPA projects. This is consistent with such firms actively managing their ID-TPA projects and transferring their business expertise to these CSR activities. It supports the idea that managerial capacity and organizational competence can be translated across both commercial and social domains.

With manually collected information, we conduct multiple robustness tests, including controls for the business nature and life-cycle stage of ID-TPA projects. Due to data limitations, we cannot control for region-level macrofactors, as most firms do not disclose TPA project locations. However, we address this concern by using a subsample that does provide location information.

Our paper contributes to the CSR literature. To our knowledge, this is the first paper that investigates the efficiency of an individual CSR activity using firm-level inputs and outputs. Compared to papers on CSR's financial outcome, research on the social outcome of CSR activities is limited. Examining the efficiency with which a CSR activity achieves its stated social goal, we expand the CSR research to meet the demands of a broader set of stakeholders.

By focusing on firm-level CSR efficiency under institutional pressure, we contribute to an emerging research stream that examines the implementation quality of CSR rather than its financial consequences alone. Our findings could help stakeholders make more informed CSR decisions, leading to enhanced social outcomes at a reduced cost.

Our paper also has significant policy implications, highlighting the role of business enterprises in fulfilling social goals. Achieving the SDGs is a worldwide endeavor. Although our research is based on Chinese data, its insights can be valuable for stakeholders in both developed and developing nations, aiding in the advancement of social objectives. Our findings reveal decreased efficiency when firms are compelled to undertake CSR initiatives. Rather than urging expenditure on CSR, stakeholders should prioritize CSR outcomes and devise alternative mechanisms to foster voluntary participation. Our results suggest that current global initiatives to mandate sustainability reporting have the potential to promote efficient CSR practices. Lastly, our finding that more efficient firms manage their TPA projects more efficiently justifies the UN's call for businesses to apply their expertise in achieving the SDGs [5].

In the next section, we introduce the institutional background of the TPA campaign and develop hypotheses. We discuss the research design in Section 3. We describe the sample construction process and relevant statistics in Section 4. We provide empirical results in Section 5. The last section discusses the limitations and concludes.

2. Hypothesis development

Eliminating poverty in all its forms everywhere is the No. 1 goal in UN's list of 2030 SDGs. Unlike their predecessor, the Millennium Development Goals, the SDGs explicitly call on all businesses to apply their creativity and innovation to solve sustainable development challenges. According to SDG Compass, while many firms have set targets related to carbon emission, water usage and other environmental issues, it is relatively rare for them to set poverty-alleviation targets—partly because measuring poverty reduction attributable to firm-level actions remains difficult.

China's TPA campaign offers a unique setting that partially addresses this challenge. Firms are required to disclose both their expenditures on TPA projects and the number of people reportedly lifted out of poverty, making it possible to examine the *efficiency* of CSR, at the firm level—defined here as the input-output relationship of a specific CSR activity.

Public companies classify their TPA projects into nine categories. However, many of these (e.g. ecological protection, education, or healthcare) do not have readily quantifiable outputs related to poverty alleviation. For instance, while a firm may report the number of people receiving medical aid, the social value of that aid is not easily comparable across firms or projects. To ensure consistency and interpretability in our outcome measure, we focus exclusively on the *industrial development* category (ID-TPA), where firms typically invest in projects such as factory construction or job creation that directly lift people out of poverty. It is also the most widely adopted TPA strategy among public companies and accounts for the largest share of their financial contributions.

We expect the efficiency of ID-TPA projects to vary systematically with firms' incentives to engage in CSR and their capacity to manage such projects effectively. The following hypotheses are grounded in this framework.

2.1 Political pressure

First, we predict that political pressure is a main factor driving firms into ID-TPA projects and has a significant impact on their efficiency. Prior research suggests that managing political expectations is critical for firms in China, where the state plays an active role in shaping corporate behavior (e.g. Lee, Walker, & Zeng, 2017). Compared to other CSRs, the political pressure for Chinese firms to engage in TPA projects is much greater. The central government has set up specific annual targets for poverty alleviation and regularly evaluates the performance of local governments in meeting these goals (e.g. State Council of China, 2016).

As a result, local governments are highly motivated to involve firms in TPA projects. The central government has also repeatedly stressed the importance of business participation in the TPA efforts (e.g. State Council of China, 2014, 2015, 2018).

Political pressure can affect CSR efficiency in multiple ways. On one hand, since the government's ultimate goal is to eliminate poverty, it should focus on the outcomes of TPA projects, i.e. the number of people alleviated from poverty. When the government has greater influence over firms' operations and executives' careers, firms may have stronger incentives to manage their TPA projects more effectively to meet these expectations. In this case, political pressure could enhance the efficiency of ID-TPA projects.

On the other hand, it is much more difficult for the government to influence the outcomes of TPA projects than the inputs. While authorities can pressure firms to spend on TPA projects, they have limited control over how the projects are implemented, especially given that many TPA projects are located in a different province or city from where the firms are based. Firms facing greater political pressure might feel that they have fulfilled government expectations simply by making contributions, regardless of the actual impact (Laufer, 2003). Without a genuine interest in alleviating poverty, such firms have little incentive to manage their TPA projects efficiently.

Because political pressure could affect the efficiency of TPA projects in both directions, we state our first hypothesis in null form:

H1. Political pressure does not affect the relationship between ID-TPA expenditures and the number of people being lifted out of poverty.

2.2 Firm visibility

Besides political pressure, firms could also engage in ID-TPA projects to improve their reputation, which in turn leads to better financial performance [6]. Prior literature has shown that CSR activities could improve firms' reputation among consumers and investors (e.g. Mohr, Webb, & Harris, 2005; Park, Kim, & Kwon, 2017; Chakravarthy *et al*., 2014). Firms with greater visibility are more likely to be noticed for their CSR successes/failures, and hence should be more motivated to improve their ID-TPA efficiency. Nevertheless, Chen *et al.* (2018) show that economic factors have little impact on Chinese firms' CSR spending, and Wang and Qian (2011) find that advertising intensity actually reduces CSR spending in China. If Chinese firms do not engage in CSR for economic benefits related to improved reputation, highly visible firms may lack incentives to manage their ID-TPA projects efficiently. Thus, it remains an open empirical question whether firm visibility translates into more efficient CSR execution in the TPA context. We state H2 in null form:

H2. Firms' visibility does not affect the relationship between ID-TPA expenditures and the number of people being lifted out of poverty.

2.3 Mandatory CSR reporting

Since 2008, certain Chinese firms have been required to issue CSR reports (Footnote 4). The mandate increases the transparency of CSR activities and allows stakeholders to better monitor them. These firms thus may have stronger incentives to improve the efficiency of their ID-TPA projects. In addition, firms tend to expand their CSR activities after the reporting mandate (Chen *et al.*, 2018; Downar, Ernstberger, Reichelstein, Schwenen, & Zaklan, 2021; Fiechter *et al.*, 2022; Kim, Wang, & Wu, 2022). The increased CSR experience could enable firms to conduct their ID-TPA projects more efficiently.

However, mandatory CSR reporting goes beyond TPA projects to encompass all aspects of a firm's CSR activities. While firms that only disclose TPA projects can focus on this particular pursuit, those issuing mandatory CSR reports may need to allocate resources and efforts across a broad range of CSR initiatives. Hence, mandatory CSR reporting could potentially dilute the

focus and reduce the efficiency of ID-TPA projects. Furthermore, Michelon, Rodrigue, and Trevisan (2020) argue that the emphasis on CSR disclosure can exacerbate the instrumental use of CSR as a risk management tool, diverting attention from genuine societal impact. They find that greater demands for CSR transparency are associated with weaker CSR practices, at least in the short run. Accordingly, we state H3 in null form [7]:

H3. Mandatory CSR reporting does not affect the relationship between ID-TPA expenditure and the number of people being lifted out of poverty.

2.4 Firm business efficiency

Finally, if firms apply their business expertise to managing ID-TPA projects, we would expect those with more efficient core operations—reflected in metrics such as ROA—to also deliver more efficient social outcomes. Such firms likely possess better management practices, superior resource allocation capabilities and stronger internal governance, which could translate into efficient implementation of ID-TPA projects.

Alternatively, it is possible that firms achieve business efficiency by focusing on value creation for shareholders. Such fixation on shareholder returns could result in underinvestment in CSR quality, treating it as a cost to minimize. For instance, Liu, Shen, Welker, Zhang, and Zhao (2021) find that earnings pressure is associated with environmental harm. Again, the net effect is theoretically ambiguous, leading to our final hypothesis in null form [8]:

H4. Firms' business efficiency does not affect the relationship between ID-TPA expenditures and the number of people being lifted out of poverty.

3. Research design

Because we can only examine efficiency for firms that engage in ID-TPA projects, and these firms could differ systematically from those that do not, we use a two-stage Heckman selection model to correct for any sample selection bias. In the first stage, we model the likelihood of firms engaging in ID-TPA projects using all firm-year observations in a probit regression. In the second stage, we examine the efficiency of ID-TPA projects within the sample with ID-TPA projects after incorporating the inverse Mills ratio from the first-stage model.

The first-stage and second-stage models are shown in the following two equations, respectively.

$$\begin{aligned} IDTPA = {} & \alpha_0 + \alpha_{\mathrm{i}} \{\text{political pressure measures}: \\ & SOE, PC, POVERTY, DECENTRAL\} + \alpha_{\mathrm{j}} \{\text{visibility measures}: \\ & ADV, COVER\} + \alpha_{\mathrm{k}} MAND\_CSR + \alpha_{\mathrm{l}} ADJ\_ROA + \alpha_{\mathrm{m}} \{\text{firm resource measures}: \\ & SIZE, SLACK, LEV\} + \alpha_{\mathrm{n}} IDratio + \text{year dummies} + \text{industry dummies} \end{aligned} \tag{1}$$

$$\begin{aligned} NPOP = {} & \beta_0 + \beta_{\mathrm{l}} logTPA\_EXP + \beta_{\mathrm{i}} \{\text{political pressure measures}: \\ & SOE, PC, POVERTY, DECENTRAL\} \times logTPA\_EXP + \beta_{\mathrm{j}} \{\text{visibility measures}: \\ & ADV, COVER\} \times logTPA\_EXP + \beta_{\mathrm{k}} MAND\_CSR \times logTPA\_EXP \\ & + \beta_{\mathrm{l}} ADJ\_ROA \times logTPA\_EXP + \beta_{\mathrm{m}} IMR + \text{control variables} \\ & + \text{year dummies} + \text{industry dummies} \end{aligned} \tag{2}$$

The dependent variable *IDTPA* in Eq. (1) is an indicator variable equal to one if a firm contributes to ID-TPA projects, zero otherwise [9]. We expect factors that are hypothesized to affect ID-TPA efficiency to affect firms' propensity to engage in ID-TPA projects, too. Prior studies (e.g. Chen *et al.*, 2018; Wang & Qian, 2011; Lys, Naughton, & Wang, 2015; Li, Lin, Zhang, & Zheng, 2024) have shown that firms are more likely to engage in CSR if they are under greater political pressure, more visible to stakeholders and required to issue CSR reports (*MAND_CSR*). We further predict that firms more efficient in their own businesses, as measured by the industry-adjusted ROA (*ADJ_ROA*), are more likely to choose ID-TPA to utilize their business expertise. In addition, firms with more resources can better afford to contribute to ID-TPA projects, and firms in industries with more extensive participation in ID-TPA projects (*IDratio*) are more likely to engage in ID-TPA projects (Jeong & Kim, 2016). Following prior studies (e.g. Wang & Qian, 2011), our proxies for resources include the natural log of total assets (*SIZE*), cash flows scaled by assets (*SLACK*) and the total liabilities to total assets ratio (*LEV*) [10].

We do not expect the percentage of industry peers engaging in ID-TPA to have any direct impact on the efficiency of CSR activities, hence, *IDratio* is excluded from the second stage regression and serves as a valid instrumental variable (Wang & Qian, 2011) [11].

The dependent variable in Eq. (2), *NPOP*, is the number of people lifted out of poverty, measured in thousands. To examine the impacts on efficiency, we include the interactions between *logTPA_EXP* (the natural log of the ID-TPA expenditure, measured in 10,000 RMB) [12] and the political pressure measures (H1), visibility measures (H2), mandatory CSR reporting (H3) and firm efficiency measure (H4). Positive (negative) coefficients on these variables indicate that more (fewer) people are lifted out of poverty for the same amount of expenditures, i.e. greater (lower) efficiency [13].

Control variables consist of factors documented in prior studies (e.g. Boulouta, 2013; Wang & Qian, 2011) that affect corporate social performance, including firm size, financial performance, risk and industries (*SIZE*, *ADJ_ROA*, *LEV*, *SLACK* and industry dummies) and all variables that have been interacted with expenditures. Ideally, we would also like to control the difficulty of TPA projects, such as the characteristics of the counties where the projects are located. However, firms are not required to disclose the locations of their TPA projects, which often differ from the firms' own locations. In Section 5, we control for the difficulty of TPA projects for a subset of firms that voluntarily disclose the locations of their TPA projects.

We include year dummies and industry dummies in both equations to control for the time trend and varying CSR practices across industries (e.g. Loayza & Raddatz, 2010).

Our political pressure measures include the following. First, *SOE* is an indicator variable for enterprises owned by the state. Unlike private enterprises, state-owned enterprises (SOEs) have the obligation to satisfy certain social responsibilities deemed appropriate by the state (e.g. Wei, 2020). Given that the state is committed to eliminating poverty and that it controls SOEs and the promotion of their top executives, SOEs face greater political pressure to participate in ID-TPA projects. Second, *PC* is an indicator variable equal to one if a firm has a political connection. Following the prior literature (e.g. Faccio, 2006; Fan, Wong, & Zhang, 2007), we consider a firm to have *PC* if its chairperson or CEO is a current or former government official, or a member of the Chinese People's Congress or the Chinese People's Political Consultative Conference. Top executives holding such positions likely face greater pressure to engage in CSR activities (e.g. Du & Chen, 2016; Jia & Zhang, 2010; Li & Guo, 2022; Wang & Qian, 2011). On the other hand, prior studies show that political connections could shield firms from consequences of immoral activities (Fisman & Wang, 2015; Wu, Johan, & Rui, 2016), and hence it is possible that politically connected firms contribute less to CSR (Muttakin, Mihret, & Khan, 2018). Whether the net impact of political connection on firms' participation in ID-TPA projects is positive or negative is an empirical question.

Third, we expect firms registered in poverty-stricken provinces to face greater political pressure to participate in ID-TPA projects. Local governments in these provinces are impelled by the central government to eliminate poverty, and they will, in turn urge companies to

contribute. Firms in such provinces may also spend more on ID-TPA to please other stakeholders (e.g. employees, local residents) or to satisfy top executives' personal moral imperatives. We define *POVERTY* to be equal to one if a firm is registered in a province with more poverty-stricken towns [14] than the national median, and zero otherwise. The last proxy for political pressure is *DECENTRAL*, which measures the degree of decentralization of the provincial government where a firm is registered (Cai, Zheng, Ma, & Lu, 2018), [15]. Local governments with a higher degree of decentralization have less influence on firms, and hence higher *DECENTRAL* means lower political pressure.

We have two firm visibility measures. We use a firm's sales expense to sales revenue ratio (*ADV*) to measure firms' visibility to consumers (e.g. Wang & Qian, 2011). We use the natural log of the number of analysts covering a firm (*COVER*) to measure firms' visibility in the capital markets.

To test H3, we interact *logTPA_EXP* with *MAND_CSR*, an indicator variable equal to one if a firm is required to issue a CSR report annually.

To test H4, we use *ADJ_ROA*, a firm's *ROA* minus the industry median *ROA*, to measure how efficiently a firm manages its own business. Firms that are able to generate more profits with fewer assets than their industry peers are more efficient.

Unless otherwise specified, the financial variables (e.g. *SIZE* and *LEV*) are measured at the beginning of the year. Detailed variable definitions are provided in Appendix 2.

4. Sample and descriptive statistics

In September 2016, China Securities Regulatory Commission (CSRC) required the Shanghai Stock Exchange and Shenzhen Stock Exchange to create guidance on public firms' disclosure of poverty-alleviation-related social responsibilities. In December 2016, both stock exchanges issued guidance requiring listed firms to disclose their expenditures on TPA projects and the number of people lifted out of poverty by such projects in their annual reports following a standard format (please see Appendix 1).

We collect expenditures on TPA projects, numbers of people lifted out of poverty and other firm-related variables from CSMAR, a popular database on China's public firms.

We exclude financial firms from our analysis because their TPA expenditures consist primarily of special loans to people in poverty, which differ in nature from other firms' TPA expenditures.

Our sample starts from all public firms issuing annual reports between 2016 and 2018. After eliminating financial firms and firms without available control variables, we end up with 8,035 observations. As shown in Table 1, Panel A, 881 (1,858) firm-years, or 11.0% (23.1%) of the sample, engage in ID-TPA projects (general TPA projects).

Table 1 Panel A also shows that the percentage of firms with ID-TPA projects (general TPA projects) has increased over time from 7.8% (18.1%) in 2016 to 11.3% (23.1%) in 2017 and 13.4% (27.5%) in 2018.

Table 1 Panel B shows the by industry distribution of our sample firms. The majority of our sample firms are in manufacturing. The utilities industry and the mining industry have the highest participation rate in both the ID-TPA projects and general TPA projects, possibly because these industries tend to be dominated by state-owned firms, which face greater political pressure to engage in TPA projects. The agriculture, forestry, animal husbandry and fishery industry, with expertise that is especially useful for industrial development in rural areas, also engages in ID-TPA projects extensively.

Table 1 Panel C shows the distribution of our sample across provinces. The more developed provinces (Guangdong and Zhejiang) have the largest numbers of public companies, but firms in less developed provinces are more likely to engage in general TPA projects (Tibet and Guizhou) and ID-TPA projects (Guizhou and Yunnan). This evidence is consistent with firms in poor areas being more motivated to engage in TPA projects.

Table 1. Sample distribution

Panel A: Distribution of TPA firms by year

Year	No. of firms (1)	No. of firms with TPA expenditures (2)	(2)/(1)	No. of firms with ID-TPA expenditures (4)	(4)/(1)
2016	2,489	450	0.181	194	0.078
2017	2,633	607	0.231	297	0.113
2018	2,913	801	0.275	390	0.134
Total	8,035	1,858	0.231	881	0.110

Panel B: Distribution of TPA firms by industry sector

Industry sector	No. of firms (1)	No. of firms with TPA expenditures (2)	(2)/(1)	No. of firms with ID-TPA expenditures (4)	(4)/(1)
Utilities	241	118	0.490	71	0.295
Mining	189	91	0.481	52	0.275
Transportation, warehousing and postal	200	82	0.410	40	0.200
Agriculture, forestry, animal husbandry and fishery	113	37	0.327	29	0.257
Construction	213	72	0.338	36	0.169
Water, environment and public facility management	101	33	0.327	19	0.188
Culture, sports and entertainment	126	40	0.317	21	0.167
Health and social work	24	7	0.292	1	0.042
Wholesale and retail	434	110	0.253	57	0.131
Real estate	363	84	0.231	30	0.083
Manufacturing	5,148	1,088	0.211	490	0.095
Leasing and business services	113	15	0.133	8	0.071
Scientific research and technology services	75	9	0.120	2	0.027
Education	8	1	0.125	0	0.000
Information transmission, software and information services	591	65	0.110	22	0.037
Accommodation and catering	28	3	0.107	0	0.000
Comprehensive industry	68	3	0.044	3	0.044
Total	8,035	1,858	0.231	881	0.110

Panel C: Distribution of TPA firms by province

Province	No. of firms (1)	No. of firms with TPA expenditures (2)	(2)/(1)	No. of firms with ID-TPA expenditures (4)	(4)/(1)
Tibet	34	30	0.882	9	0.265
Guizhou	58	44	0.759	23	0.397
Yunnan	85	42	0.494	28	0.329
Jiangxi	100	45	0.450	19	0.190
Hainan	75	31	0.413	22	0.293
Qinghai	33	14	0.424	8	0.242
Guangxi	91	37	0.407	19	0.209
Hubei	249	102	0.410	60	0.241

(*continued*)

Table 1. Continued

Panel C: Distribution of TPA firms by province

Province	No. of firms (1)	No. of firms with TPA expenditures (2)	(2)/(1)	No. of firms with ID-TPA expenditures (4)	(4)/(1)
Shaanxi	120	48	0.400	23	0.192
Gansu	78	29	0.372	17	0.218
Henan	208	79	0.380	37	0.178
Hunan	229	85	0.371	51	0.223
Sichuan	294	109	0.371	56	0.190
Shanxi	32	12	0.375	7	0.219
Ningxia	36	13	0.361	5	0.139
Xinjiang	125	42	0.336	22	0.176
Inner Mongolia	67	21	0.313	12	0.179
Fujian	284	88	0.310	31	0.109
Anhui	248	73	0.294	37	0.149
Chongqiong	118	27	0.229	11	0.093
Hebei	144	33	0.229	11	0.076
Liaoning	204	44	0.216	24	0.118
Beijing	746	161	0.216	91	0.122
Heilongjiang	99	19	0.192	8	0.081
Guangdong	1,230	213	0.173	100	0.081
Shanghai	622	109	0.175	38	0.061
Tianjin	124	19	0.153	10	0.081
Jiangsu	830	120	0.145	44	0.053
Shandong	463	65	0.140	22	0.048
Zhejiang	899	93	0.103	28	0.031
Jilin	110	11	0.100	8	0.073
Total	8,035	1,858	0.231	881	0.110

Source(s): Table by authors

Table 2 shows the amount of expenditures in each category of TPA projects [16]. The most popular TPA projects are in industrial development (1,119 firm-years) and social assistance (1,115 firm-years), while the least popular TPA projects are in relocation (108 firm-years) and minimum social welfare (137 firm-years). Industrial development is by far the most costly type of TPA project. The least expensive type of TPA project is transfer employment. Firms only report *NPOP* for two categories of TPA projects consistently: the industrial development category and the Others category.

Table 3 Panel A and B show the descriptive statistics and correlation coefficients for the overall sample used in the first stage regression and the sample with ID-TPA projects used in the second stage regression, respectively. In the first-stage (second-stage) analysis, 34% (49.7%) of firms are SOEs, 12.3% (13.7%) of firms have political connections, 26.5% (47.9%) of firms are located in poor provinces, and the average decentralization index is 0.868 (0.452). These univariate results indicate that firms with ID-TPA projects tend to face higher political pressure, consistent with our expectation. While in the overall sample, 12.9% of firms are required to issue CSR reports (*MAND_CSR*), the percentage is 34.5% among firms with ID-TPA projects. Firms with ID-TPA projects also tend to be larger with higher leverage.

The correlations between *IDTPA* and other variables in Panel A are generally consistent with our expectations and prior findings. In Panel B, the correlation between *NPOP* and TPA expenditures was significantly positive, as expected. Correlations among independent variables are generally modest.

Table 2. TPA expenditures and number of people lifted out of poverty by category

TPA Categories	No. of firms reporting expenditures	Mean Expenditures (in RMB)	Median expenditures (in RMB)	Mean number of people out of poverty	Median number of people out of poverty
Industrial development	1,119	136,193,900	700,000	1,435	20
Transfer employment	376	1,178,326	54,000	NA	NA
Relocation	108	NA	NA	NA	NA
Education	451	13,074,430	474,000	NA	NA
Health care	394	4,551,666	181,500	NA	NA
Ecological protection	235	13,199,630	195,000	NA	NA
Minimum social welfare	137	1,200,417	90,000	NA	NA
Social assistance	1,115	7,623,632	350,000	NA	NA
Others	961	17,517,670	384,100	663	0

Note(s): The CSMAR database only provides the number of people lifted out of poverty for TPA projects in the Industrial Development and Others categories consistently. For TPA projects in other categories, it provides the number of people receiving assistance instead

Source(s): Table by authors

5. Empirical results

5.1 First-stage ID-TPA choice estimates

Table 4 presents the results of the first-stage Heckman selection model (Eq. (1)). Columns (1)–(4), respectively, show the estimated coefficients for political pressure measures, visibility measures, CSR reporting mandate and business efficiency, while Column (5) combines all variables. In all columns, we control for firm resource measures and *IDratio*. The results are generally consistent across columns, so for conciseness, we will focus our discussion on Column (5).

We find strong and consistent evidence that political pressure increases firms' tendency to engage in ID-TPA projects: *SOE*, *PC* and *POVERTY* have positive coefficients, while *DECENTRAL* has a negative coefficient.

The two visibility measures, *ADV* and *COVER*, do not have significant impacts on firms' decision to contribute to ID-TPA projects.

MAND_CSR has a significantly positive coefficient, suggesting that mandatory CSR reporting increases firms' participation in ID-TPA projects. Chen *et al.* (2018) and Fiechter *et al.* (2022) find that CSR reporting mandate, or the expectation of such mandate, leads to improved corporate social performance and lower financial performance, and infer that firms spend more on CSR because of the reporting mandate. Our results complement their findings by providing direct evidence on this matter.

The coefficient of *ADJ_ROA* is significantly positive in Column (5), but not in Column (4), providing some evidence that firms' business efficiency increases their tendency to engage in ID-TPA projects.

As to other variables, we find that *SIZE* has a significantly positive coefficient, supporting the notion that firms with more resources can afford to contribute to CSR. High leverage firms are also more likely to participate in ID-TPA projects, in that *LEV* has a significantly positive coefficient in Columns (2) to (6). The seemingly surprising result is nevertheless consistent with Chen *et al.*'s (2018) finding that firms with less cash spend more on CSR [17].

Lastly, *IDratio* has a significantly positive coefficient. Since we do not consider *IDratio* to have any direct impact on ID-TPA efficiency, we excluded it from our second-stage regression to satisfy the exclusion restrictions (Wang & Qian, 2011).

Table 3. Descriptive statistics and correlation coefficients

	Mean	Std. dev.	1	2	3	4	5	6	7	8	9	10	11	12	13
Panel A: Heckman first-stage variables															
IDTPA	0.11	0.312	1												
SOE	0.34	0.474	0.242***	1											
PC	0.123	0.329	0.015	0.006	1										
POVERTY	0.265	0.441	0.170***	0.141***	0.030***	1									
DECENTRAL	0.868	0.924	−0.158***	−0.149***	−0.008	−0.501***	1								
ADV	0.073	0.083	−0.031***	−0.155***	0.007	−0.001	−0.055***	1							
COVER	1.271	1.051	0.081***	−0.034***	0.056***	−0.027**	0.084***	0.057***	1						
MAND_CSR	0.129	0.336	0.225***	0.281***	0.011	−0.014	−0.003	−0.076***	0.211***	1					
ADJ_ROA	0.001	0.053	0.006	−0.111***	−0.01	−0.080***	0.080***	0.056***	0.368***	0.074***	1				
SIZE	8.443	1.264	0.282***	0.353***	0.005	0.013	−0.023**	−0.180***	0.344***	0.463***	0.034***	1			
LEV	0.427	0.208	0.140***	0.282***	0.016	0.071***	−0.071***	−0.243***	−0.009	0.170***	−0.331***	0.495***	1		
SLACK	0.012	0.089	0.011	−0.002	0.028**	−0.011	0.004	−0.027**	0.116***	0.025**	0.114***	0.076***	0.007	1	
IDratio	0.109	0.067	0.217***	0.187***	−0.070***	0.106***	−0.159***	−0.086***	−0.062***	0.081***	0.012	0.176***	0.074***	0.007	−0.088***
Panel B: Heckman second-stage variables															
NPOP	0.866	3.841	1												
TPA_EXP	2,870	12,581	0.321***	1											
SOE	0.497	0.5	−0.094***	−0.173***	1										
PC	0.137	0.344	−0.003	−0.033	0.024	1									
POVERTY	0.479	0.5	−0.120***	−0.024	−0.006	0	1								
DECENTRAL	0.452	1.169	0.102***	0.049	0.082**	−0.011	−0.338***	1							
ADV	0.066	0.083	−0.026	−0.050	−0.241***	0.053	0.036	−0.190***	1						
COVER	1.513	1.089	0.147***	0.086**	−0.080**	−0.014	−0.056*	0.124***	0.042	1					
MAND_CSR	0.345	0.476	0.105***	−0.007	0.201***	−0.050	−0.191***	0.120***	−0.165***	0.280***	1				
ADJ_ROA	0.002	0.041	0.118***	0.006	−0.186***	−0.001	−0.053*	0.117***	0.161***	0.363***	0.108***	1			
SIZE	9.505	1.537	0.177***	0.038	0.232***	−0.033	−0.222***	0.170***	−0.267***	0.398***	0.508***	0.055	1		
LEV	0.51	0.191	0.03	0.054	0.168***	−0.038	−0.067**	0.0460	−0.364***	0.035	0.177***	−0.314***	−0.498***	1	
SLACK	0.015	0.071	0.029	0.056*	−0.068**	0.012	0.021	0.064*	0.066*	0.129***	0.079**	0.186***	0.083**	−0.01	1

Note(s): ***/**/*: significant at the 1%/5%/10% level (two-tailed), respectively. Please refer to Appendix 2 for variable definitions

Source(s): Table by authors

Table 4. First-stage ID-TPA choice estimates

Dependent variable: *IDTPA*	(1)	(2)	(3)	(4)	(5)
SOE	0.5046***				0.4937***
	(10.91)				(10.35)
PC	0.2264***				0.2289***
	(3.41)				(3.43)
POVERTY	0.4132***				0.4341***
	(8.54)				(8.90)
DECENTRAL	−0.1246***				−0.1254***
	(−5.88)				(−5.85)
ADV		0.4046			0.4215
		(1.51)			(1.46)
COVER		−0.0144			0.0092
		(−0.66)			(0.37)
MAND_CSR			0.3928***		0.3534***
			(6.82)		(5.94)
ADJ_ROA				0.4796	1.1068**
				(1.03)	(2.09)
SIZE	0.3478***	0.3689***	0.2945***	0.3575***	0.2748***
	(17.34)	(17.35)	(13.84)	(18.38)	(11.34)
LEV	0.0043	0.3411***	0.4201***	0.3906***	0.2753*
	(0.03)	(2.71)	(3.43)	(2.88)	(1.91)
SLACK	0.0842	−0.0322	−0.0250	−0.0833	0.0267
	(0.31)	(−0.12)	(−0.10)	(−0.32)	(0.10)
IDratio	4.9605***	5.5145***	5.4889***	5.4717***	5.0531***
	(5.67)	(6.57)	(6.54)	(6.52)	(5.76)
Constant	−5.3275***	−5.2143***	−4.6956***	−5.1286***	−4.9520***
	(−24.94)	(−25.29)	(−22.48)	(−25.60)	(−21.69)
Industry dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.2215	0.1609	0.1687	0.1606	0.2298
N	8,035	8,035	8,035	8,035	8,035

Note(s): This table presents the first-stage estimation results of the two-stage Heckman selection model (Eq. (1)). The dependent variable is *IDTPA*, an indicator variable equal to one if a company engages in ID-TPA projects in the current year. Columns (1)–(4) report the results when the test variables for hypotheses H1–H4 are individually added, respectively; while column (5) reports the results when all test variables are added simultaneously. Numbers in parentheses are *z*-statistics. ***/**/*: significant at the 1%/5%/10% level (two-tailed), respectively. Please refer to Appendix 2 for variable definitions

Source(s): Table by authors

5.2 Second-stage ID-TPA efficiency estimates

Table 5 presents the results of the second-stage estimation after incorporating the inverse Mills ratio from the first-stage model (Table 4 Column 5). The sample used to estimate Eq. (2) includes 881 firm-years with ID-TPA projects. Column (1) shows the results without interaction terms, Columns (2)–(5) show the results with interactions between TPA expenditures and test variables for H1–H4, respectively. Column (6) shows the results with all interactions. The results in Columns (1)–(5) are generally consistent with those in Column (6), so for conciseness, we will focus the discussion on Column (6).

As expected, *logTPA_EXP* had a significantly positive impact on *NPOP* in all regressions. Based on its coefficient in Column (1), when the *TPA_EXP* increases from 700,000 RMB (the median expenditure on ID-TPA projects as reported in Table 2) to 710,000 RMB (an increase of about $1,500), five (0.7632*(log(71)-log(70))*1,000 = 4.7) more people will be lifted out of poverty.

Table 5. Second-stage ID-TPA efficiency estimates

Dependent variable: *NPOP*	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	No interactions	Political pressure ×logTPA_EXP	Visibility × logTPA_EXP	CSR reporting mandate × logTPA_EXP	Competence × logTPA_EXP	All	OLS
logTPA_EXP	0.7632***	1.4376***	0.5438***	0.5480***	0.7028***	1.2216***	0.8664***
	(9.18)	(10.75)	(3.31)	(4.89)	(8.63)	(6.04)	(6.40)
*SOE*logTPA_EXP*		−0.8036***				−0.6552***	−0.3932***
		(−5.24)				(−4.24)	(−3.90)
*PC*logTPA_EXP*		−0.3008				−0.2080	−0.0829
		(−1.41)				(−1.00)	(−0.59)
*POVERTY*logTPA_EXP*		−0.5057***				−0.4122***	−0.2885***
		(−3.10)				(−2.60)	(−2.75)
*DECENTRAL*logTPA_EXP*		0.2178***				0.2233***	0.1541***
		(2.60)				(2.95)	(3.23)
*ADV*logTPA_EXP*			0.7616			0.4152	0.2103
			(0.68)			(0.39)	(0.31)
*COVER*logTPA_EXP*			0.1030			−0.1068	−0.1075**
			(1.35)			(−1.36)	(−2.05)
*MAND_CSR*logTPA_EXP*				0.4064**		0.3584**	0.2022*
				(2.49)		(2.18)	(1.82)
*ADJ_ROA*logTPA_EXP*					10.5597***	7.5707***	6.7381***
					(6.10)	(4.18)	(5.42)
SOE	0.0112	4.1876***	−0.0009	1.0378	−0.0928	4.4165***	1.3077**
	(0.01)	(3.69)	(−0.00)	(1.56)	(−0.11)	(4.54)	(2.46)
PC	−0.1282	1.3043	−0.1363	0.3365	−0.2643	1.3520	0.4842
	(−0.20)	(1.11)	(−0.22)	(0.59)	(−0.43)	(1.24)	(0.67)
POVERTY	−0.6609	1.8733*	−0.6553	0.3978	−0.5365	2.5404***	0.7713
	(−0.84)	(1.87)	(−0.83)	(0.70)	(−0.70)	(2.89)	(1.48)
DECENTRAL	0.3547	−0.7445*	0.3549	0.0835	0.3786	−1.0524***	−0.5601**
	(1.40)	(−1.69)	(1.41)	(0.40)	(1.55)	(−2.71)	(−2.43)
ADV	1.4125	2.9745	−1.6096	2.3366	2.5870	1.4911	1.1711
	(0.51)	(1.11)	(−0.30)	(0.88)	(0.95)	(0.29)	(0.36)
COVER	−0.3593*	−0.2382	−0.8255**	−0.3731*	−0.4008*	0.2144	0.4512*
	(−1.65)	(−1.15)	(−2.03)	(−1.72)	(−1.89)	(0.53)	(1.72)
MAND_CSR	0.4963	0.4886	0.4968	−0.4175	0.4430	−0.1819	−0.5161
	(0.69)	(0.72)	(0.69)	(−0.47)	(0.64)	(−0.22)	(−0.98)
ADJ_ROA	−1.6898	0.8031	−1.3646	1.7303	−46.7754***	−27.6137***	−21.9077***
	(−0.30)	(0.15)	(−0.24)	(0.33)	(−5.03)	(−2.94)	(−3.51)
SIZE	−1.5804***	−1.3820***	−1.3919**	−0.6562	−1.4633***	−0.7522*	−1.1258***
	(−2.94)	(−2.71)	(−2.50)	(−1.55)	(−2.81)	(−1.81)	(−4.77)
*SIZE *logTPA_EXP*	0.3344***	0.3314***	0.2974***	0.2553***	0.3126***	0.3103***	0.2786***
	(5.45)	(5.58)	(4.31)	(3.88)	(5.24)	(4.55)	(6.09)
LEV	0.4000	0.6317	0.5147	1.1905	1.1129	2.2509**	0.8642
	(0.28)	(0.47)	(0.37)	(0.97)	(0.81)	(1.97)	(1.21)
SLACK	1.2770	1.7150	1.3994	1.1054	2.2147	2.1132	−0.5035
	(0.50)	(0.70)	(0.54)	(0.43)	(0.88)	(0.87)	(−0.31)
IMR	−0.9950	−0.5342	−0.9249	2.0031	−0.8279	2.6143**	
	(−0.51)	(−0.29)	(−0.47)	(1.63)	(−0.44)	(2.41)	
Constant	−2.2649	−6.6327	−1.5446	−8.5544***	−3.3465	−12.6942***	−3.3401***
	(−0.53)	(−1.60)	(−0.36)	(−2.58)	(−0.80)	(−5.14)	(−4.05)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.0540	0.0724	0.0547	0.0528	0.0643	0.0715	0.2867
N	881	881	881	881	881	881	881

Note(s): This table presents the second-stage estimation results of the two-stage Heckman selection model (Eq. (2)). The dependent variable is *NPOP*, the number of people lifted out of poverty by a company in the current year. Columns (2)–(5) report the results when the test variables for hypotheses H1–H4 are individually interacted with *logTPA_EXP* (the natural log of current year expenditures on ID-TPA projects), respectively; while columns (1) and (6) report the results when no interaction is added, or when the interactions between *logTPA_EXP* and all test variables are simultaneously added, respectively. Column (7) presents the OLS estimation results of Eq. (2) as a robustness check. Numbers reported in parentheses are *t*-statistics. ***/**/*: significant at the 1%/5%/10% level (two-tailed), respectively. Please refer to Appendix 2 for variable definitions

Source(s): Table by authors

To test H1, we examined the interaction between ID-TPA expenditures and political pressure measures. The coefficients on *SOE*×*logTPA_EXP* and *POVERTY*×*logTPA_EXP* are significantly negative, while the coefficient on *DECENTRAL*×*logTPA_EXP* is significantly positive. With the same amount of TPA spending, firms owned by the state, firms in poor provinces and firms in provinces with *less* decentralized governments lift fewer people out of poverty. These results suggest that political pressure weakens the association between the input and outcome of TPA projects. However, we cannot conclude that firms under greater political pressure manage their ID-TPA projects less efficiently because these firms could be forced to take on more challenging ID-TPA projects, which require more spending to lift people out of poverty. We explore this issue further in Section 5.4.

To test H2, we examined the interaction between ID-TPA expenditures and visibility measures. Neither *ADV* nor *COVER* has a significant impact on TPA efficiency.

As to H3, the coefficient on *MAND_CSR*×*logTPA_EXP* is significantly positive, i.e. mandatory CSR reporting strengthens the association between the input and outcome of TPA projects. However, firms required to issue CSR reports are not randomly selected, so *MAND_CSR* could capture other firm characteristics. We explore this issue further in Section 5.3.3.

As to H4, a firm's abnormal profitability (*ADJ_ROA*) has a positive impact on the relationship between *logTPA_EXP* and *NPOP*, supporting the notion that firms more efficient in their own business also manage their ID-TPA projects more efficiently.

As to the control variables, we find that *SIZE*×*logTPA_EXP* has a significantly positive coefficient, i.e. larger firms probably have the resources and expertise to run ID-TPA projects more efficiently. Among the stand-alone variables, *SOE*, *POVERTY* and *LEV* tend to have positive coefficients, while *DECENTRAL*, *ADJ_ROA* and *SIZE* tend to have negative coefficients [18].

The coefficient of IMR is significant in Column (6), but not in the other columns. As Certo, Busenbark, Woo, and Semadeni (2016) point out, an insignificant IMR does not indicate an absence of sample selection bias. If a sample is small, Heckman models may not produce significant IMRs even in the presence of sample selection bias.

The Heckman two-stage model has been criticized for lacking robustness to model specifications, while OLS is typically more robust (Tucker, 2010; Lennox, Francis, & Wang, 2012; Certo *et al.*, 2016). Hence, as a robustness check, we also present the OLS regression results of Eq. (2). Table 5 Column (7) shows that our main findings hold in the OLS regression [19]. We replicate all future analyses with OLS, too, but do not present the results for conciseness (available upon request).

5.3 Robustness tests

5.3.1 The business nature of ID-TPA projects. ID-TPA projects in different businesses could differ in their abilities to lift people out of poverty. To the extent that business types are also correlated with firm characteristics, we should control for the business nature of ID-TPA projects when examining their efficiency to avoid omitted variable bias. In this section, we control for the effects of business types on efficiency by focusing on firms that disclose and only disclose a single business type for their ID-TPA projects.

We were able to identify the business types for 805 out of the 881 observations with ID-TPA projects. Among those, 537 firm-years disclose only one business type. Table 6 Panel A presents the mean values of the number of people lifted out of poverty, expenditures and other test variables by business type. The majority of these projects are in agriculture & forestry (348), followed by Income from Assets (IA) [20] (51). There are also 108 firms disclosing that they have ID-TPA projects which cannot be easily classified ("others"). ID-TPA projects in the IA category report the greatest expenditures and lift the most people out of poverty. The descriptive statistics indicate that firm characteristics could be correlated with business types. For instance, firms with ID-TPA projects in agriculture and forestry are more likely to be owned by the state and located in poor provinces.

Table 6. Business types of ID-TPA projects

Panel A: Firms that only disclose one business type

Business types	No. of firms	number of people out of poverty (mean)	Expenditures (mean)	SOE (mean)	PC (mean)	POVERTY (mean)	DECENTRAL (mean)	ADV (mean)	COVER (mean)	MAND_ CSR (mean)	ADJ_ ROA (mean)
Agriculture and Forestry (*AF*)	348	557.046	1910.482	0.503	0.135	0.537	0.358	0.077	1.506	0.296	0.003
Income from Assets (*IA*)	51	3280.333	13046.690	0.412	0.157	0.353	0.768	0.072	1.470	0.314	0.008
Science and Technology (*ST*)	16	33.813	341.856	0.438	0.188	0.250	1.055	0.044	2.247	0.188	0.016
Tourism (*Tour*)	14	539.571	5458.695	0.429	0.214	0.500	−0.493	0.082	2.108	0.429	−0.002
Others	108	603.815	6730.317	0.352	0.102	0.454	0.475	0.057	1.309	0.213	0.004
Total	537	809.043	3983.230	0.460	0.134	0.493	0.419	0.072	1.500	0.281	0.004

Panel B: ID-TPA efficiency after controlling for business types

	Dependent variable: *NPOP* (1)	(2)
logTPA_EXP	0.3244*	1.0506***
	(1.85)	(4.20)
*SOE*logTPA_EXP*		−0.9007***
		(−4.80)
*PC*logTPA_EXP*		−0.6025**
		(−2.42)
*POVERTY*logTPA_EXP*		−0.2785
		(−1.50)

(*continued*)

Table 6. Continued

Panel B: ID-TPA efficiency after controlling for business types

	Dependent variable: *NPOP*	
	(1)	(2)
*DECENTRAL*logTPA_EXP*		0.1622*
		(1.80)
*ADV*logTPA_EXP*		−1.7288
		(−1.35)
*COVER*logTPA_EXP*		−0.1189
		(−1.27)
*MAND_CSR*logTPA_EXP*		0.6393***
		(3.28)
*ADJ_ROA*logTPA_EXP*		9.6728***
		(4.53)
*AF*logTPA_EXP*	0.2562	0.0930
	(1.15)	(0.46)
AF	−1.0472	−0.6126
	(−0.88)	(−0.57)
*IA*logTPA_EXP*	1.1170***	0.4461
	(3.69)	(1.59)
IA	−4.4916**	−2.1503
	(−2.17)	(−1.16)
*ST*logTPA_EXP*	−0.8919	−1.5337**
	(−1.08)	(−2.04)
ST	3.3382	6.1212*
	(0.84)	(1.76)
*Tour*logTPA_EXP*	0.5459	0.9769*
	(0.90)	(1.80)
Tour	−4.3010	−4.8115
	(−1.06)	(−1.34)
IMR	−2.3625	0.3113
	(−0.88)	(0.21)

(*continued*)

Table 6. Continued

Panel B: ID-TPA efficiency after controlling for business types

	Dependent variable: *NPOP*	
	(1)	(2)
Constant	3.7584	−7.2807**
	(0.65)	(−2.11)
Control variables	Yes	Yes
Industry dummies	Yes	Yes
Year dummies	Yes	Yes
Pseudo R^2	0.0579	0.0890
N	537	537

Note(s): This table reports ID-TPA project efficiencies when we control for the business type of these projects. The sample includes companies that report only one type of ID-TPA projects. Panel A shows the mean values of variables across different business types. Panel B presents the second-stage estimation results of the two-stage Heckman selection model (Eq. (2)) after controlling for the business type of ID-TPA projects. The dependent variable is *NPOP*, the number of people lifted out of poverty by a company in the current year. Columns (1) and (2) report the results without and with the test variables for hypotheses H1–H4 interacted with *logTPA_EXP* (the natural log of current year expenditures on ID-TPA projects), respectively. Numbers reported in parentheses are *t*-statistics. ***/**/*: significant at the 1%/5%/10% level (two-tailed), respectively. Please refer to Appendix 2 and Table 6 Panel A for variable definitions

Source(s): Table by authors

To control for business types in the efficiency regression, we include business type dummies and their interactions with ID-TPA expenditures in Eq. (2) for firms disclosing a single business type [21]. Table 6 Panel B presents the results. For conciseness, we show only business - type dummies and variables of interest.

We find some evidence that ID-TPA projects in IA (significant only in Column 1) and tourism (significant only in Column 2) are more efficient in lifting people out of poverty, while projects in science and technology (significant only in Column 2) are less efficient. More importantly, the coefficients of our test variables remain the same, i.e. political pressure measures weaken the association between expenditures and numbers of people being lifted out of poverty, while mandatory CSR reporting and industry-adjusted ROA strengthen the association. Our findings in Table 5 are robust to the control of the business nature of the ID-TPA projects.

5.3.2 Life cycle stages of ID-TPA projects. In our main tests shown in Section 5.2, we match the output (number of people lifted out of poverty) with the input (ID-TPA expenditures) made in the same year. It is possible that some ID-TPA projects have a long start-up time, and *NPOP* reported in the current year could be driven by TPA expenditures in previous years. Furthermore, TPA projects in different stages of business life cycles may be different in their input-output relations. Projects in the start-up stage may lift fewer people out of poverty than those in a more mature stage. On the other hand, people who are alleviated out of poverty in the earlier stage of a project could be different from those who remain in poverty for a longer time (e.g. those who are immediately employed by an ID-TPA project could be more skilled or motivated). In that case, it could take greater expenditures to lift people out of poverty in the later years of a project.

Given that the government aimed to eliminate poverty as quickly as possible, most ID-TPA projects are intended to produce fast results. We believe that the potential mismatch between *NPOP* and current-year *TPA_EXP* and the life cycle stages of projects are unlikely to be big issues. Nevertheless, to make sure that those concerns do not significantly alter our results, we conducted several robustness tests.

First, we estimate Eq. (2) using each firm's average *NPOP* and *logTPA_EXP* over the sample period. This approach minimizes the potential mismatch problem because it matches a TPA project's total output with the total input over the entire sample period. Table 7 Column (1) presents the regression results. The sample includes 479 unique firms, and because each firm now appears only once, we do not include year dummies in the regression.

Second, we add firms' accumulated ID-TPA expenditures in prior years (*APEXP*) to Eq. (2) to control for the potential impact of prior investments on TPA efficiency [22]. Table 7 Column (2) presents the results when l*ogAPEXP* and its interaction with the current year expenditure are added to Eq. (2).

Lastly, we attempt to control the life cycle stages of the ID-TPA projects directly by adding a proxy for project age (*Age*) in Eq. (2), [23]. Table 7 Column (3) presents the estimation results for Eq. (2) when *AGE* and its interaction with TPA expenditures are added to Eq. (2).

In all three tests, the results are consistent with that in Tables 5, i.e. political pressure weakens the input-output relation of an ID-TPA project [24], while mandatory CSR reporting and abnormal profitability strengthen the relation. Neither l*ogAPEXP* nor the interaction term has a significant coefficient in Table 7 Column (2), supporting the notion that most ID-TPA projects do not require a long start-up stage. The interaction between *AGE* and TPA expenditure has a significantly negative coefficient, suggesting that as an ID-TPA project ages, it becomes more challenging to lift people out of poverty, probably because these people are more entrenched in poverty.

5.3.3 Mandatory CSR reporting. Table 5 shows that the coefficient on *MAND_CSR*×*logTPA_EXP* is significantly positive in Eq. (2), indicating that mandatory CSR reporting improves TPA efficiency. However, firms required to issue CSR reports are not randomly selected. As shown in Footnote 4, larger firms and firms with better corporate governance are more likely to be subject to the CSR reporting mandate. So *MAND_CSR* could

Table 7. The life-cycle stage of ID-TPA projects

	Dependent variable: *NPOP*		
	(1) Using sample averages	(2) Control for accumulated prior expenditures	(3) Control for project ages
logTPA_EXP	0.8092***	1.2401***	1.5638***
	(3.09)	(5.70)	(5.36)
*SOE*logTPA_EXP*	−0.3612*	−0.6644***	−0.6428***
	(−1.95)	(−4.21)	(−4.15)
*PC*logTPA_EXP*	−0.1176	−0.2005	−0.2114
	(−0.59)	(−0.95)	(−1.01)
*POVERTY*logTPA_EXP*	−0.3498	−0.4124***	−0.3728**
	(−1.59)	(−2.59)	(−2.34)
*DECENTRAL*logTPA_EXP*	0.2780**	0.2197***	0.2310***
	(2.37)	(2.89)	(3.04)
*ADV*logTPA_EXP*	0.5335	0.2681	0.4241
	(0.44)	(0.25)	(0.40)
*COVER*logTPA_EXP*	−0.0111	−0.1022	−0.1017
	(−0.13)	(−1.30)	(−1.29)
*MAND_CSR*logTPA_EXP*	0.3895*	0.3580**	0.3711**
	(1.90)	(2.16)	(2.25)
*ADJ_ROA*logTPA_EXP*	6.9142***	7.6459***	7.2468***
	(3.45)	(4.20)	(3.96)
logAPEXP		0.1805	
		(1.20)	
*logAPEXP*logTPA_EXP*		−0.0175	
		(−0.85)	
Age			1.8050*
			(1.76)
*Age*logTPA_EXP*			−0.3659*
			(−1.80)
IMR	1.1683	2.6203**	2.8840***
	(1.20)	(2.41)	(2.79)
Constant	−7.9825***	−13.0120***	−14.9763***
	(−3.22)	(−5.18)	(−5.61)
Control variables	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Year dummies	No	Yes	Yes
Pseudo R^2	0.0896	0.0719	0.0726
N	479	881	881

Note(s): This table presents the second-stage estimation results of the two-stage Heckman selection model (Eq. (2)) after controlling for the life-cycle stage of ID-TPA projects. The dependent variable is *NPOP*, the number of people lifted out of poverty by a company in the current year. Column (1) controls for the life-cycle stage of ID-TPA projects by using the by-firm sample average of each variable in the regression; column (2) controls for the life-cycle stage of ID-TPA projects by adding *logAPEXP* (the natural log of accumulated past ID-TPA expenditures) and its interaction with *logTPA_EXP* (the natural log of current year expenditures on ID-TPA projects); column (3) controls for the life-cycle stage of ID-TPA projects by adding *Age* (the age of ID-TPA projects) and its interaction with *logTPA_EXP*. Numbers reported in parentheses are *t*-statistics. ***/**/*: significant at the 1%/5%/10% level (two-tailed), respectively. Please refer to Appendix 2 for definitions of the remaining variables

Source(s): Table by authors

capture other firm characteristics, especially firm size and corporate governance. We conducted two robustness tests to check whether other firm characteristics could be driving the results.

First, we add firms' corporate governance index (*Gov*) [25] and its interaction with TPA expenditures in Eq. (2) to control for corporate governance. As shown in Table 8, *Gov*×*logTPA_EXP* has a significantly positive coefficient in Column (1), but the significance disappears after adding other variables of interest in Column (2). More importantly, controlling for *Gov* does not change the estimated coefficients of *MAND_CSR*×*logTPA_EXP* and other variables of interest [26].

Second, we run our analysis with a PSM sample [27], matching the mandatory CSR reporting firms to non-mandatory-CSR reporting firms following Chen *et al.*'s approach (2018, p. 173 and p. 189). Table 8 Columns (3) and (4) show that our results still hold, suggesting that the CSR reporting mandate, rather than correlated firm characteristics [28], increases ID-TPA efficiency.

Lastly, we did not investigate the impact of voluntary CSR reporting in the main analysis because of the endogeneity issue (Footnote 7). Nevertheless, to the extent that voluntary CSR reporting increases the transparency of a firm's CSR activities and enables better monitoring, we may expect voluntary CSR reporting to increase a firm's ID-TPA efficiency. To test that, we define an indicator variable equal to one if a firm voluntarily issues a CSR report (*VOL_CSR*), and add it and its interaction with ID-TPA expenditure to Eq. (2). Table 8 Columns (5) and (6) show that neither the standalone variable nor the interaction term has a significant coefficient, i.e. voluntary CSR reporting has no effect on TPA efficiency. It is possible that voluntary CSR reports from Chinese firms are not informative and hence do not improve transparency, or that a stress on disclosure actually moves firms' attention away from societal concerns (Michelon *et al.*, 2020). Because of the potential endogeneity issue, these results need to be interpreted with caution. The estimated coefficients of *MAND_CSR*×*logTPA_EXP* and other variables remain the same after controlling for voluntary CSR reporting.

5.3.4 Reporting quality. Our analyses are based on firms' own disclosures of TPA expenditures and the number of people alleviated from poverty. These numbers could contain biases and errors since CSR reports could be unreliable (Pinnuck, Ranasinghe, Soderstrom, & Zhou, 2020). Such biases and errors may affect our efficiency results. For example, if firms overstate the number of people lifted out of poverty (TPA expenditures), they will appear more (less) efficient. Because the government keeps accurate records of people in poverty, it is difficult for firms to misstate the number of people alleviated from poverty. Also, given that the TPA expenditures affect cash flows and earnings, they will be monitored by auditors. Overall, we do not believe reporting quality is an important factor driving our findings. Nevertheless, we control for reporting quality (proxied by auditor size and firms' financial reporting transparency) in an untabulated analysis (available upon request), and we find that our results hold and reporting quality proxies do not have significant impacts on TPA efficiency.

5.4 Controlling for the difficulty of TPA projects

There are two explanations for the negative association between political pressure and ID-TPA efficiency. First, firms facing greater political pressure manage ID-TPA projects less efficiently. Second, these firms are pushed to take on more difficult TPA projects which demand more expenditures to lift people out of poverty. To differentiate between these two explanations, we re-estimate Equation (2) after adding controls for the difficulty of TPA projects.

It is understandably challenging to measure the difficulty of TPA projects. The proxy we use is the accessibility of a TPA project's location [29]. Usually, it takes much more to alleviate people living in remote mountains out of poverty than those living close to highways (more accessible, less difficult). Firms are not required to disclose where their TPA projects are located, but some do voluntarily provide such information in their annual reports. Among the

Table 8. Mandatory CSR reporting: further analyses

	Dependent variable: *NPOP*					
	(1)	(2)	(3)	(4)	(5)	(6)
	Controlling for governance (GOV)		PSM		Voluntary CSR reporting	
logTPA_EXP	0.7280***	1.4068***	0.5201***	0.3302	0.5782***	1.2170***
	(5.89)	(6.47)	(3.62)	(0.90)	(5.11)	(5.97)
*SOE*logTPA_EXP*		−0.6913***		−0.5984***		−0.6600***
		(−3.89)		(−2.69)		(−4.23)
*PC*logTPA_EXP*		−0.2259		−0.3531		−0.2134
		(−1.05)		(−1.01)		(−1.03)
*POVERTY*logTPA_EXP*		−0.4410***		0.0961		−0.4013**
		(−2.65)		(0.33)		(−2.50)
*DECENTRAL*logTPA_EXP*		0.2464***		0.4938***		0.2206***
		(3.07)		(2.81)		(2.91)
*ADV*logTPA_EXP*		0.4933		2.0012		0.4125
		(0.45)		(1.34)		(0.39)
*COVER*logTPA_EXP*		−0.1788**		−0.0188		−0.1031
		(−2.13)		(−0.17)		(−1.30)
*MAND_CSR*logTPA_EXP*	0.3736**	0.3405**	0.4428*	0.4088*	0.4621**	0.3931**
	(2.16)	(1.97)	(1.96)	(1.83)	(2.31)	(1.98)
*ADJ_ROA*log_TPA_EXP*		7.7647***		12.0608***		7.5861***
		(3.88)		(4.61)		(4.18)
Gov	−1.1862**	−0.1018				
	(−2.17)	(−0.19)				
*Gov*log_TPA_EXP*	0.2082**	−0.0291				
	(2.28)	(−0.31)				
VOL_CSR					−0.6293	0.1563
					(−0.57)	(0.16)
*VOL_CSR*logTPA_EXP*					0.3038	0.2898
					(1.54)	(1.50)
IMR	−0.7417	3.0376**	0.6244	0.4952	−0.3663	2.5420**
	(−0.35)	(2.38)	(0.43)	(0.36)	(−0.20)	(2.35)
Constant	−2.0856	−13.7427***	−4.8618	−6.0148*	−2.9638	−12.5980***
	(−0.46)	(−4.88)	(−1.28)	(−1.89)	(−0.73)	(−5.10)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.0594	0.0756	0.0547	0.0742	0.0557	0.0715
N	816	816	596	596	881	881

Note(s): This table presents additional analyses regarding the impacts of mandatory CSR reporting on ID-TPA efficiency. The dependent variable is *NPOP*, the number of people lifted out of poverty by a company in the current year. Column (1) and (2) report the regression results after controlling for *Gov* (corporate governance index) and its interaction with *logTPA_EXP* (the natural log of current year expenditures on ID-TPA projects) without and with other test variables, respectively; column (3) and (4) report the regression results with the propensity-score-matched sample without and with other test variables, respectively; column (5) and (6) report the regression results after controlling for *VOL_CSR* (an indicator variable equal to one if a company voluntarily issues a CSR report) and its interaction with *logTPA_EXP* (the natural log of current year expenditures on ID-TPA projects) without and with other test variables, respectively. Numbers reported in parentheses are *t*-statistics. ***/**/*: significant at the 1%/5%/10% level (two-tailed), respectively. Please refer to Appendix 2 for the definitions of the remaining variables

Source(s): Table by authors

881 firm-years with ID-TPA projects, we were able to manually collect the TPA locations for 395 firm-years [30].

We then use the following three measures to capture the accessibility of the ID-TPA project location: (1) *ROADACC* is the percentage of rural households with access to public roads;

(2) *KMS* is the natural log of the number of kilometers of roadways; and (3) *RAIL_KMS* is the natural log of the number of kilometers of railways. We obtain *ROADACC* from the National Bureau of Statistics' 2017 Poverty Monitoring Report of Rural China, which does not cover all provinces. As a result, our number of observations was reduced to 303 when we used *ROADACC* to measure accessibility. We obtain roadway and railway kilometers from CSMAR.

To see whether firms systematically select the locations of ID-TPA projects, we regress the accessibility measures on firm characteristics. The results are shown in Table 9. Among the test variables for H1–H4, we find that only political pressure measures are consistently correlated with accessibility measures. In particular, *SOE* (*DECENTRAL*) has a significantly negative (positive) coefficient in all three regressions, i.e. state-owned firms (firms in decentralized provinces) are more (less) likely to engage in ID-TPA projects in hard-to-reach areas. *PC* and *POVERTY* have positive coefficients in one or two of the regressions, providing some evidence that firms with political connections and firms in poor provinces are less likely to pick difficult ID-TPA projects in hard-to-reach areas [31]. Hence, we need to control for accessibility when evaluating the impact of political pressure on ID-TPA efficiency.

Except for *ADV* in the *KMS* regression, none of the test variables for H2–H4 have significant coefficients, indicating that firm visibility, mandatory CSR reporting and business efficiency do not affect ID-TPA locations.

Table 9. The relationship between test variables and the accessibility of ID-TPA project locations

	(1) *ROADACC*	(2) *KMS*	(3) *RAIL_KMS*
SOE	−0.1773**	−0.0921*	−0.0861*
	(−2.42)	(−1.82)	(−1.71)
PC	−0.0955	0.0939	0.1383**
	(−0.99)	(1.45)	(2.15)
POVERTY	0.0736	0.3992***	0.3215***
	(1.04)	(8.94)	(7.33)
DECENTRAL	0.1119***	0.1257***	0.0899***
	(3.27)	(7.06)	(5.04)
ADV	0.2104	−0.9744***	−0.4253
	(0.49)	(−3.34)	(−1.49)
COVER	−0.0258	0.0142	0.0250
	(−0.71)	(0.58)	(1.06)
MAND_CSR	0.1097	0.0652	0.0300
	(1.55)	(1.38)	(0.65)
ADJ_ROA	1.1755	1.1627*	−0.1783
	(1.25)	(1.94)	(−0.30)
Constant	100.0028***	11.7189***	7.9947***
	(425.74)	(90.25)	(72.48)
Controls	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Pseudo R^2	0.0721	0.3519	0.2088
N	303	395	395

Note(s): This table presents the association between measures of accessibility of ID-TPA project locations and test variables for hypotheses H1–H4. The dependent variables in columns (1)–(3) are *ROADACC* (percentage of rural households with access to public roads in a province), *KMS* (natural log of the number of kilometers of roadways in a province) and *RAIL_KMS* (natural log of the number of kilometers of railways in a province), respectively. Numbers reported in parentheses are *t*-statistics. ***/**/*: significant at the 1%/5%/10% level (two-tailed), respectively. Please refer to Appendix 2 for variable definitions

Source(s): Table by authors

Next, we add these accessibility measures and their interactions with *logTPA_EXP* to Eq. (2) to control for the difficulty of ID-TPA projects, and check whether political pressure measures still have negative impacts on efficiency. For conciseness, Table 10 presents only the estimation results for the interaction terms.

Table 10 yields two important observations. First, the interactions between the accessibility measures and *logTPA_EXP* have significantly positive coefficients, suggesting that the accessibility measures are valid proxies for TPA project difficulty (more accessible, greater efficiency). Second, after controlling for accessibility, political pressure still has a negative impact on the input-output relation of ID-TPA projects. Specifically, *SOE*×*logTPA_EXP* and *PC*×*logTPA_EXP* have significantly negative coefficients, i.e. firms owned by the state and firms with political connections are less efficient [32]. The coefficients on *POVERTY*×*logTPA_EXP* and *DECENTRAL*×*logTPA_EXP* are no longer significant [33].

Overall, our findings suggest that firms under greater political pressure manage ID-TPA projects less efficiently. These firms may believe that contributing to ID-TPA projects is sufficient to reduce the risk of adverse actions from the government, regardless of the actual outcome. These firms have the potential to further enhance social welfare by improving the efficiency of their CSR activities.

Table 10. ID-TPA efficiency estimates after controlling for project difficulty

Dependent variable: *NPOP*	TPA_Accessibility = *ROADACC*		TPA_Accessibility = *KMS*		TPA_Accessibility = *RAIL_KMS*	
logTPA_EXP	0.1493***	0.2319***	0.1256***	0.2016***	0.1157***	0.1774***
	(6.95)	(5.36)	(7.54)	(5.98)	(7.13)	(5.39)
*SOE*logTPA_EXP*		−0.1291***		−0.1250***		−0.1142***
		(−3.04)		(−3.88)		(−3.59)
*PC*logTPA_EXP*		−0.0934*		−0.0784*		−0.1039**
		(−1.89)		(−1.90)		(−2.45)
*POVERTY*logTPA_EXP*		0.0265		0.0230		0.0398
		(0.62)		(0.67)		(1.20)
*DECENTRAL*logTPA_EXP*		0.0040		0.0008		0.0070
		(0.19)		(0.06)		(0.45)
*TPA_Accessibility*logTPA_EXP*	0.0923**	0.0735*	0.0736**	0.0678**	0.0821***	0.0873***
	(2.44)	(1.85)	(2.27)	(2.11)	(2.74)	(2.81)
IMR	−0.5477	−0.3503	0.1844	0.1824	0.1754	0.1058
	(−1.40)	(−1.13)	(1.25)	(0.91)	(0.87)	(0.51)
Constant	28.6052*	21.7370	2.0723	1.2453	1.0374	0.7843
	(1.88)	(1.39)	(1.35)	(0.78)	(0.84)	(0.64)
Control variables	Y	Y	Y	Y	Y	Y
Industry dummies	Y	Y	Y	Y	Y	Y
Year dummies	Y	Y	Y	Y	Y	Y
Pseudo R^2	0.1337	0.1636	0.1234	0.1586	0.1277	0.1653
N	303	303	395	395	395	395

Note(s): This table presents the second-stage estimation results of the two-stage Heckman selection model (Eq. (2)) after controlling for the difficulty of ID-TPA projects, proxied by the accessibility of these projects' location. The dependent variable is *NPOP*, the number of people lifted out of poverty by a company in the current year. The difficulty of ID-TPA projects is proxied by *ROADACC* (percentage of rural households with access to public roads in a province), *KMS* (natural log of the number of kilometers of roadways in a province) and *RAIL_KMS* (natural log of the number of kilometers of railways in a province), respectively. Numbers reported in parentheses are *t*-statistics. ***/**/*: significant at the 1%/5%/10% level (two-tailed), respectively. Please refer to Appendix 2 for variable definitions

Source(s): Table by authors

6. Concluding remarks

To our knowledge, this is the first paper to examine the efficiency of an individual CSR activity using firm-level input and output data. We find that political pressure increases firms' participation in TPA projects but reduces the efficiency of these projects. We also find that firms required to issue CSR reports and firms more profitable than their peer manage TPA projects more efficiently.

These findings have important policy implications. In particular, policymakers and interest groups may encourage firms to adopt a more outcome-oriented approach to CSR by focusing on the results of CSR efforts rather than the level of expenditure. Mandates such as sustainability reporting may improve accountability and performance by enhancing transparency and enabling monitoring.

Our paper has several limitations. First, our study uses data from China, where the government plays a central role in economic and social policy. Thus, our findings on political pressure might not directly apply to other institutional contexts. Nevertheless, as firms across the globe increasingly face pressure to engage in CSR—whether political, regulatory or reputational—our results offer relevant insights into the trade-offs between mandated participation and voluntary initiative. Second, our analysis is limited to TPA projects with measurable outputs. Some CSR projects, such as those related to education or health care, provide important but non-quantifiable or comparable benefits and are excluded from our efficiency measures. We acknowledge this constraint and encourage future research to develop broader tools for assessing long-term and multi-dimensional CSR outcomes. Third, to the extent that multiple organizations invest in poverty alleviation in the same region and the efforts of other organizations could interact with the focal firms' efforts, the validity of our efficiency measure could be weakened. Lastly, our analysis is constrained by data availability. Most firms do not disclose the locations of their TPA projects, which limits our ability to control for local macroeconomic factors. However, we address this concern by using a subsample of firms that voluntarily disclose project locations, enabling us to control for project difficulty.

Our findings suggest that CSR efficiency varies meaningfully with firm characteristics and institutional incentives. Stakeholders should move beyond encouraging CSR participation toward promoting effective, outcome-oriented implementation. In particular, our evidence supports the UN's call for leveraging business expertise in achieving the SDGs, not just through participation, but through effective execution.

Availability of data and materials

All data are from publicly available sources as described in the paper. Some data are hand-collected from publicly available sources.

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Notes

1. We acknowledge that the number of people being lifted out of poverty does not fully capture the economic and social outcome of TPA projects. To the extent that the stakeholders' well-being cannot

be quantified, we cannot directly measure the efficiency of CSR activities. The interpretation of our findings is subject to this important caveat.

2. ID-TPA projects provide persistent income to people in poverty by employing them or helping them establish profitable businesses (e.g. these projects could help poor villages produce and process teas and fruits).

3. In fact, only TPA projects in the industrial development category and the "others" category report numbers of people being lifted out of poverty. Since, by definition, the "others" category assembles a variety of projects different in nature, we do not investigate the "others" category.

4. The Shanghai Stock Exchange (SSE) requires firms in its Corporate Governance Index (a compilation of companies with the best governance practices), firms with shares listed overseas and financial firms to issue annual CSR reports; the Shenzhen Stock Exchange (SZSE) requires firms in its Shenzhen 100 Index (the largest firms) to issue annual CSR reports.

5. SDG Compass: The Guide for Business Action on the SDGs. https://sdgcompass.org/wp-content/uploads/2015/12/019104_SDG_Compass_Guide_2015.pdf

6. While some may argue that, besides enhancing reputation, ID-TPA projects could also provide direct economic benefits to firms (e.g. an ID-TPA project could supply raw materials to the firm), we do not believe firms profit from these projects directly. First, the type of TPA projects is significantly constrained by local conditions and may not be related to firms' own business (e.g. a manufacturer may not be able to sponsor any ID-TPA projects related to its own business in a poor village with no public roads or skilled labor). Second, TPA projects are usually too small to have any perceivable impacts on firms' operations, even when they are related to the firms' own business. Lastly, TPA projects are in poverty-stricken areas with limited resources and poor infrastructure. It is unlikely that firms would invest in these projects for business purposes.

7. We have also considered the impact of voluntary CSR reporting on ID-TPA efficiency. Because a firm's decision to provide voluntary CSR reports likely depends on its CSR spending and performance, the endogeneity issue could be severe. We thus decide not to investigate the effects of voluntary CSR reporting on ID-TPA efficiency in our main analysis. In supplementary analysis reported in Section 5, we find that voluntary CSR reporting does not have a significant coefficient in the ID-TPA efficiency regression, and the inclusion of a voluntary CSR reporting indicator variable does not affect the main results.

8. Besides firms' business efficiency, we have also considered CSR performance ratings as a measure of firms' ability to efficiently manage TPA projects. However, by definition, CSR ratings should have already incorporated firms' performance in TPA, i.e. there is a mechanical relation between CSR ratings and the input and output of TPA. Hence, we do not develop a hypothesis based on CSR ratings or firms' CSR performance in general. In untabulated analysis, we find that Hexun CSR ratings, a popular rating for CSR performance in China, do not have a significant impact on TPA efficiency.

9. We model firms' decisions to engage in ID-TPA projects, not TPA projects in general, because only ID-TPA projects produce measurable outputs. Firms with *IDTPA* equal to zero (the benchmark firms) include firms that do not engage in TPA at all and firms that only engage in non-industrial-development type of TPA. In robustness tests, we separate the two benchmark groups in the first stage following an anonymous reviewer's suggestion. Whether the benchmark firms are those that do not engage in TPA at all or those that engage only in non-industrial-development type of TPA projects (Omar *et al.*, 2006) in the first stage analysis, our second-stage ID-TPA efficiency estimation results remain qualitatively the same.

10. Prior studies often include return on assets (ROA) as an explanatory variable for CSR spending (e.g. Lin, Tan, Zhao, & Karim, 2015). In our sample, *ROA* is highly correlated with *ADJ_ROA* (the Pearson correlation coefficient is 0.981), hence we exclude *ROA* to avoid multicollinearity issues. When we do include *ROA*, its coefficient is positive but not significant and the estimated coefficients of other variables remain qualitatively the same.

11. We indeed find that *IDratio* does not have a significant coefficient when it is included in Eq. (2) (available upon request).

12. Following prior studies (Lin *et al.*, 2015), we take the natural log of expenditures because CSR expenditures are highly skewed.

13. We could also measure efficiency as the output/input ratio. This measure, however, could yield extreme observations when the denominator is small. Moreover, by regressing the output on the input, we allow the intercept to be non-zero, i.e. the initial input needs to exceed a certain amount in order to produce any output. We could also construct the efficiency measure using the DEA (the data envelop analysis) methodology. Given that we only have a single input (TPA expenditures) and a single output (number of people out of poverty), it is not clear whether the DEA approach provides any benefits (Demerjian, Lev, & McVay, 2012).
14. A town with more than two percent of its population in poverty will be designated as a "poverty-stricken town." In China's western regions, the standard is three percent. Poverty-stricken towns are eligible for preferential policies and financial support for poverty alleviation.
15. An assumption underlying the arguments for *POVERTY* and *DECENTRAL* is that a firm's main operations are located in its registration province. This is a valid assumption. Article 10 of the Chinese Company Law states: "The domicile of a company shall be the place where its main administrative organization is located." In addition, a company can face disciplinary actions if its registration location differs from the location of its main operation (Chen *et al.*, 2018).
16. Table 2 is based on all observations reporting TPA expenditures regardless of the availability of any other variables. The sample in Table 2 is bigger than what is used in other tables.
17. One possible explanation is that the Chinese government has a strong influence on firms' access to the capital markets and bank loans (Zhang, Zhang, & Shen, 2010), forcing firms with less cash or higher leverage, i.e. those with stronger financing needs, to contribute to TPA projects to please the government. In particular, the "Green Credit Guidelines" by the China Banking Regulatory Commission ties access to bank financing to a firm's CSR performance (Chen *et al.*, 2018, P. 171).
18. We have no reason to expect *LEV* and *SLACK* to affect the efficiency of ID-TPA projects. Nevertheless, we add their interactions with TPA expenditures in Eq. (2) as robustness checks (untabulated). The coefficients on these interaction terms are insignificant, and the coefficients of other variables remain the same.
19. One exception is that the negative coefficient on *COVER*× *logTPA_EXP* becomes significant in the OLS regression, i.e. more visible firms conduct their ID-TPA projects less efficiently.
20. Photovoltaic power generation is a common example of an income from assets type of ID-TPA projects. People obtain income from the electricity generated from solar panels installed on their property.
21. The business type dummies are different from the industry dummies already controlled in Eq. (2). For example, a manufacturing company (the industry of a company) could engage in an ID-TPA project in agriculture & forestry (the business type of the ID-TPA project).
22. The accumulated expenditure is assumed to be zero in the first year when a firm discloses ID-TPA projects. We acknowledge that this assumption may understate prior expenditures when the first time a firm disclosed ID-TPA projects was in 2016—it could have contributed to such projects before 2016, but did not report since such disclosure was not required before 2016.
23. Because firms do not disclose how long they have been contributing to ID-TPA projects, we construct the age proxy (*AGE*) based on some reasonable assumptions. First, if the first year a firm discloses ID-TPA projects is after 2016, the first year of disclosure is considered the first year of the ID-TPA projects. Since this firm did not disclose any ID-TPA projects in 2016 as required, its projects must be started later. Second, if a firm disclosed ID-TPA projects in 2016, the projects could be started in 2016 or before 2016. In this case, we read the firm's disclosure to see whether its projects are of pairing-off assistance to a specific area. In the initial stage of the TPA movement, pairing-off assistance was the main format of TPA, taken on by firms owned by the central government in 2013, followed by more firms in 2014. We expect that firms with these ID-TPA projects are more likely to have initiated their projects before 2016 than those without such projects. Hence, for firms reporting ID-TPA projects in 2016, we assume their projects started in 2014 (2016) if the projects are (not) of pairing-off assistance. As robustness checks, we have also tried two alternative definitions of the initiation time: (1) we assume a firm's TPA projects started in 2015 (2016) if they are (not) of pairing-off assistance and (2) we assume all firms reporting ID-TPA projects in 2016 started their projects in 2016. Our results remain the same (available upon request).

24. The only difference is that the coefficient on *POVERTY*×*logTPA_EXP* is not significant in Table 7 Column (1).
25. Following Zhou, Xu, and Lu (2020), we obtain the corporate governance index from a principal component analysis on seven governance measures: executive compensation, executive shareholding, percentage of independent board members, board size, institutional shareholding, percentage of shares held by the second to the fifth largest shareholders and whether the CEO is the chair. This reduces our sample size by 7% and hence we decide not to include this variable in our main analysis.
26. One exception is that the negative coefficient on *COVER* × *logTPA_EXP* becomes significant.
27. A difference-in-differences (DiD) design is often considered ideal to establish causality. We cannot conduct the DiD test because the mandatory CSR reporting requirements were implemented in 2008, before the initiation of TPA projects.
28. The PSM approach could only control for observable firm characteristics (Tucker, 2010). The Chen *et al.*'s (2018) model includes the following observable characteristics: market capitalization, share turnover, stock returns, ROE, state ownership, political connection, donation, the number of analysts following and whether a firm belongs to a high-pollution industry.
29. Other possible proxies include the percentage of local people in poverty and the average income of local people in poverty. We are only able to obtain these variables at the province-level, and their interaction terms with the TPA expenditures do not have significant coefficients in the *NPOP* regression, i.e. we find no evidence that these variables affect TPA efficiency. It is likely that these province-level measures do not accurately capture the local poverty level.
30. We exclude firm-years that disclose multiple locations for their ID-TPA projects.
31. The four measures of political pressure are not correlated with ID-TPA project location accessibility in the same direction, suggesting that different measures capture different aspects of political pressure, which could have multifaceted impacts on firms' decisions.
32. It seems that politically connected firms are more likely to engage in ID-TPA projects (Table 4), but they might be able to use their political connections to seek out easier projects (Table 9). When the project difficulty is not controlled, these firms appear as efficient as others (Table 5), while in fact, they are less efficient (Table 10). State-owned firms, on the other hand, face a different kind of political pressure: they not only spend more on ID-TPA projects, but they also take on more challenging projects, and they are less efficient after controlling for that.
33. It is possible that the reduced sample size lowers the power of the regression.

Supplementary material

The supplementary material for this article can be found online.

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