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Corporate environmental responsibility and financing patterns: Does firm size matter?

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ABSTRACT

This article provides a comprehensive assessment of the impact of corporate environmental responsibility (CER) on financing patterns of working capital and fixed investment. Financing sources include internal funds, equity, different types of debt financing, and government grants. Specifically, this study examines differences in the impacts of CER on financing patterns for smaller and larger firms. Based on a sample of 15,082 firms covering 27 countries, our empirical findings indicate that environmentally responsible activities do not significantly affect financing patterns of working capital but affect the use of internal finance and almost all external sources for capital expenditures. Moreover, the impacts of environmentally responsible activities on capital expenditures vary across financial sources and depend on firm size. The revealed pecking order among financing sources and changes in the debt ratio offer valuable insights into the validity of capital structural theories for smaller and larger eco-friendly firms.

KEYWORDS

Corporate environmental responsibility; capital structure; financing pattern; small firms

Introduction

The Paris COP 21 climate agreement, which entered into force on November 4, 2016, has prompted many countries to aim for carbon neutrality. This has put the connection between financing and the environment on the radar of financial institutions, corporate managers, policymakers, and researchers due to stricter environmental standards and increased environmental awareness. For example, the United Nations Framework Convention on Climate Change (UNFCCC) defines climate finance as “local, national or transnational financing—drawn from public, private and alternative sources of financing—that seeks to support mitigation and adaptation actions that will address climate change.” Generally, financial development has been found to reduce total carbon dioxide emissions and environmental degradation (Khan et al., 2019; Lahiani et al., 2021). However, the absence of a standardized

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method for evaluating firms' environmental impacts indicates that financial intermediaries may differ in their consideration of environmental factors.

This paper examines the impacts of corporate environmental responsibility (CER, henceforth) on the choices of finance sources, using the firm-level data from the latest World Bank Enterprise Surveys for Central and Eastern European and Central Asian countries. Financing sources include internal funds and external financing sources, such as debt, equity, and government grants. We further differentiate between sources of financing for working capital and fixed investment. Specifically, this study compares the impacts of CER on financing patterns for smaller and larger firms.¹ The conceptualization of this study is grounded in various overarching theories. Capital structure theories, such as pecking order theory (Myers & Majluf, 1984) and trade-off theory (Bradley et al., 1984) explain financing choices and capital structure. Information asymmetry, a key factor in developing capital structure theories, can arise due to environmental risk, suggesting a relationship between environmental activities and financing choices. For small firms, most of the financial decisions and environmental investments are taken by their owner-managers (Koropp et al., 2013; Van Auken, 2001), suggesting a moderating role for managerial theories in the relationship between environmental activities and financing choices for such firms.

Previous studies on capital structure have documented lending difficulties for small- and medium-sized enterprises (SMEs) (Carbo-Valverde et al., 2016; Rao et al., 2023), which may prevent them from optimizing capital structure. For example, when SMEs are constrained by a limited financing pool, the optimal capital structure is subject to the funding for working capital (Fazzari & Petersen, 1993). This is particularly true for eco-friendly SMEs. The challenges of sustainable transformation faced by SMEs stem primarily from financial factors (Chang et al., 2021; Hoogendoorn et al., 2019). SMEs are often constrained by access to financing due to information asymmetry and a lack of fixed assets eligible for collateral (Huang et al., 2019; D. Zhang, 2021). Moreover, financing requirements are even higher for SMEs with capital investments in environmental technologies (Andersen, 2017; Tian & Lin, 2019). Financial barriers encountered by environmentally responsible small firms are probably attributed to the fact that SMEs are perceived as small players in achieving the broader societal goal. However, the significant proportion of economic contributions made by SMEs underscores their crucial role in the green transition (Gjergji et al., 2021; Qian & Xing, 2018; Rao et al., 2023). In most European countries, SMEs account for more than 90% of all

¹For our empirical analysis, *smaller* firms refer to those with the number of employees fewer than 50 and annual incomes no more than EUR 10 million, which are compared to *larger* firms—that is, the rest of the sample firms. In the literature review, small firms and SMEs are used interchangeably because various criteria of small- and medium-sized firms are used in previous literature.

businesses and create 60% of employment in private sectors (Brammer et al., 2012; Viesi et al., 2017).

Above all, this study first contributes to the literature on financing for small firms. Although research on SME financing has been increasing in recent years (Rao et al., 2023), little attention has been given to the impact of CER on SME financing options. Incorporating CER and other components of sustainability into financing decisions may lead away from traditional capital structure theory, highlighting this study's multiple additional contributions to the literature.

First, a substantial number of studies have evaluated the impact of CER or environmental performance on debt financing, particularly concerning firms' access to bank loans (Liu et al., 2019; Wellalage & Kumar, 2021; D. Zhang, 2021). Environmental considerations may affect both debt and equity financing, leading to changes in capital structure. Despite a longstanding interest in theoretical and empirical studies on capital structure, insufficient attention has been given to the impact of CER on capital structure.

Second, we focus on different financing sources, such as internal funds, equity, and different debt structures. Most firms use multiple types, sources, and priorities of debts, which respond differently to the determinants of capital structure (Rauh & Sufi, 2010). The impact of CER on financing may vary across financing sources, depending on capital providers' CER orientation (Tang & Tang, 2012) and expected returns (Guriev & Kvasov, 2009).

Third, we differentiate between financing sources utilized for working capital and fixed investment. Therefore, we integrate financing decisions with investment types. Beck et al. (2008) point out the importance of distinguishing between financing patterns of working capital and capital expenditures but omit this from their analysis due to data limitations. Furthermore, the information requirements for financing working capital and fixed investment vary (De Almeida & Eid, 2014; Song et al., 2020), suggesting that the potential influence of CER on the capital structure may rely on the types of investments.

We obtain the main empirical results from a two-limit Tobit model for the full sample, as well as separately for smaller and larger firms. Our empirical results reveal financial institutions' environmental considerations and environmentally responsible firms' capital structure policies, which provide additional policy implications for achieving the carbon-neutrality target. This study also informs capital structure theories, although we do not directly examine the determinants of the debt ratio. Environmentally responsible firms may reduce information asymmetry regarding environmental risks, such as direct legal liabilities to clean up pollution and experience lower business risk (Aristei & Gallo, 2023; Cai et al., 2016)—both of which are, according to capital structure theories, crucial factors that influence the selection of financing sources, as discussed in the next section.

The structure of this article is as follows: The next section provides a comprehensive review of the relevant literature and presents the conceptual framework. This is followed by a description of the data, key variables, and models used in this study. Subsequently, we present the primary empirical findings and their validation. Lastly, we discuss the key findings, their implications, and potential avenues for future research.

Conceptualization

Capital structure theories and financing sources

Researchers have developed capital structure theory over the past few decades, with the trade-off theory (TOT) (Bradley et al., 1984) and pecking order theory (POT) (Myers & Majluf, 1984) emerging as seminal theories. According to TOT, firms' debt ratios result from a trade-off between the benefits of interest payment tax-deductibility and the cost of financial distress and information. According to POT, the costs of debt or equity and information asymmetry are crucial factors influencing firms' capital structures. For incremental investments, new securities issued may be undervalued due to information asymmetry, resulting in an "adverse selection" from internal funds, debt financing, and equity financing.

Information cost and asymmetry are fundamental factors in capital structure theories. For TOT, less information asymmetry decreases the cost of equity capital, implying a preference for equity financing (Dewaelheyns et al., 2019; Kalash, 2021). For POT, changes in the level of information asymmetry may alter the pecking order of financing sources. Asymmetrical information over risk may increase the cost of adverse debt selection relative to equity, indicating that firms prefer to issue equity over debt (Halov & Heider, 2011). Both agency costs of information for TOT and information asymmetry for POT depend on environmentally responsible activities and firm size, as will be discussed further.

The content of firm information may alter its role in capital structure. Edmans et al. (2016) argue that an increase in the total amount of information due to hard information, such as earnings, relative to soft information about intangible investments may increase financial efficiency. However, soft information about intangible investments is associated with real efficiency. Recently, Fulghieri et al. (2020) distinguish between asymmetrical information stemming from assets in place and growth options. They propose that the pecking order of financial sources depends on the specific types of asymmetrical information.

Bank debt and equity are two primary financing sources, particularly for large companies or when financing new fixed assets. However, other types of debt-financing sources, such as microfinance institutions (MFIs) and informal finance, cannot be ignored for small firms and firms in developing countries.

In contrast to traditional financial institutions, MFIs provide micro-loans to micro-entrepreneurs who likely have a low credit rating or limited financing knowledge (Boehe & Cruz, 2013). Providers of informal finance include private money houses, pawnshops, friends, and relatives who give loans to small entrepreneurial ventures.² Like MFIs, informal financial service providers rely on relationships and borrowers' reputations to monitor and enforce repayment, mitigating information asymmetry. MFIs and informal finance are suitable substitutes for formal financial institutions in countries with weak legal, political, or property rights (Ayyagari et al., 2010; Liu et al., 2019).

Although researchers have frequently tested capital structure theories using debt-to-equity ratios, internal financing remains the primary financial source for many firms, particularly small businesses (Zubair et al., 2020). Internal financing has a lower cost and is not affected by information asymmetry, making it the preferred choice for firms to cover investment expenditures, in line with POT. Since information asymmetry resulting from intangible investments such as innovation or environmental technology lead to higher financing costs, firms are more likely to use internal funds for such intangible investments, particularly in the early stages of development (Gorodnichenko & Schnitzer, 2013).

Financing requirements for working capital represent a temporary need; however, a firm's investment in working capital affects its value (De Almeida & Eid, 2014). One recommendation is to finance working capital with short-maturity debt, such as trade credit (Benlemlih & Cai, 2020). Researchers have observed that traditional debt financing is partially replaced by supply chain financing, especially for SMEs and regarding working capital financing (Song et al., 2020). This is because supply chain financing reduces information asymmetry between credit providers and firm managers. High-growth firms may finance their investments through delayed payment to suppliers (Agostino & Trivieri, 2019; Huang et al., 2019; Lazaridis & Tryfonidis, 2006). However, the use of trade credit lines is regarded as an indicator of credit constraints or financial distress, leading to high costs of trade credit (Gorodnichenko & Schnitzer, 2013).

CER and financing

A well-functioning financial market effectively delivers the required resources for fostering environmental-innovation diffusion and green transformation (D'Orazio & Valente, 2019). Nevertheless, financial market mechanisms depend on the availability of information (Chava, 2014). Soft information conveyed through environmentally responsible activities becomes an essential

²Trade credits are also a kind of informal financing. This study treats trade credits as an independent financial source to test whether eco-friendly firms are more likely to use trade credits.

part of all available information, which may improve financing efficiency. On the other hand, environmentally responsible firms may have more growth opportunities, and their tangible assets are less likely to experience a dramatic reduction in value due to contamination, indicating the role of CER in capital structure policies.

Environmentally responsible firms are more inclined to disclose their environmentally responsible activities to their stakeholders. This disclosure improves the level of information symmetry, lowering the cost of new equity, as suggested by POT. Meanwhile, the absence of standardized methods for evaluating such activities increases information asymmetry between firms and financial institutions, creating financial difficulties (Hoogendoorn et al., 2019). Aside from its role in information disclosure, better environmental performance reduces future liabilities and helps avoid business failure (Aristei & Gallo, 2023; Cai et al., 2016), leading to a decrease in the marginal cost of debt and an increase in the proportion of debt in the capital structure, as per TOT. Nonetheless, environmental costs decrease taxable income, resulting in lower marginal tax rates and reduced benefits of interest-payment tax deductibility (Chang et al., 2021). This, consequently, contributes to lower leverage, all other factors being constant.

Regarding the components of capital structure, researchers are particularly interested in testing the impact of CER on bank financing. On the supply side, banks may consider environmental risks when they conduct credit appraisals and design contractual terms such as collateral requirements (D. Zhang, 2021). Environmental concerns increase creditors' perception of firms' default risk and, therefore, lead to a high cost of debt (Erragragui, 2018).³ However, firms with environmental and other social-responsibility disclosure reduce information asymmetry, affecting the cost of debt financing (Raimo et al., 2021). The empirical study by Liu et al. (2019) suggests that the promotion of the "green credit guidelines" in China is associated with a shorter debt maturity for heavily polluting firms in areas with weaker ecological contexts. These empirical findings indicate that environmentally responsible firms prefer debt financing due to favorable interest rates and other desirable contractual terms.

Several studies have tested the relationship between environmental factors and the stock prices of public companies. For U.S.-listed firms, the announcement of environmentally relevant news is associated with significant stock-price changes (Flammer, 2013), and lower carbon dioxide emissions are associated with higher returns, indicating a carbon premium (Bolton & Kacperczyk, 2021). According to Baker and Wurgler's (2002) market-timing theory of capital structure, firms tend to issue equity when the market value is high relative to the book value and past market value. Consequently, good

³Erragragui (2018) evaluates the impact of CER and other components of corporate social responsibility on debt financing and only finds a significant association between CER and the cost of debt.

environmental performance is likely to raise the share of equity out of the total capital, which may offset changes in capital structure following the positive impact of CER on debt financing.

Some studies have investigated the impact of environmental factors on the target capital structure or the “adverse selection” of financial sources. Benlemlih and Cai (2020) show that environmentally responsible firms have lower debt ratios due to lower costs of financial distress. Chang et al. (2021) evaluate the correlation between latent environmental liabilities (due to environmental obligation) and the structure of financial liability for firms in the United States. These researchers document a substitute effect of environmental liability on financial liability, indicating that firms that are more environmentally responsible have a higher debt ratio.

Among finance sources, internal cash flow is the primary one for pollution-prevention investments for firms with limited access to external funding (D. Zhang et al., 2020). This indicates that environmentally responsible firms may not have sufficient internal funds to finance working capital or capital expenditures, prompting them to seek alternative sources of financing such as trade credit. The use of trade credit coincides with green practices along the supply chain. Wu et al. (2019) posit a win-win outcome of the green supply chain when trade credit financing is viable, indicating the higher availability of trade credit over bank financing for environmentally responsible firms. Government grants are another source of financing that may affect firms’ capital structure, particularly in the context of green-credit policies (Bach, 2014; B. Zhang et al., 2011; Zubair et al., 2020). For international aid, decisions regarding the allocation of funds for environmentally risky projects depend on their prior environmental performance (Buntaine, 2011).

Researchers have not given sufficient attention to testing whether the impact of CER on sources of financing differs between working capital and fixed investment. When environmentally responsible firms use internal funds to finance investments in pollution-prevention technologies or equipment, the firms may rely more on external financing. This implies that the availability of external financing plays a crucial role in determining incremental investment. Ideally, working capital and fixed investment are financed by short-term and long-term debt, respectively. Therefore, CER is more likely associated with long-term financing since it takes a long time for positive environmental performance to yield financial benefits (King & Lenox, 2001; Lin et al., 2019).

Financing sources for small firms

The determinants of financing patterns for small firms may differ from those for large firms for internal and external reasons. Capital structure theories assume that the firm’s goal is to minimize the overall cost of capital or maximize shareholders’ wealth. Small firms may have a limited choice of

financing sources, which hampers them from achieving a minimum cost of capital (Van Auken, 2001). Small business owners are often involved in strategic decision-making processes, including financing choices, and therefore small firms' financing decisions are strongly affected by owner-managers' personal attitudes (Koropp et al., 2013).

The limited financing options available to small firms is associated with information asymmetry. Song et al. (2020) state that the presence of asymmetrical information is the primary reason that prevents small firms from financing working capital with external financing sources. Additionally, the trade-off between soft and hard information depends on firm size. The lending decision made by financial institutions for a small firm is primarily based on hard information about the firm and its owners (Berger & Udell, 2006).

The causes of information asymmetry further differ between small and large firms. Theoretically, the strong influence of owner-managers on strategic decisions in small firms causes significant conflicts of interest between shareholders and financial institutions, resulting in high agency costs (Michaelas et al., 1999). For small firms, the unavailability of collateral due to the lack of tangible assets exacerbates the level of information asymmetry. Asymmetrical information regarding growth options for small firms leads to the dominant role of equity in the capital structure (Fulghieri et al., 2020). For service SMEs, the empirical results in Serrasqueiro et al. (2011) suggest that those firms' capital structure decisions follow the assumptions of POT rather than those of TOT. Furthermore, financial development and institutional context are more important in financing decisions for small firms than for large firms. For example, small firms are less constrained by credit access when they are located in a country with better property rights protections (Ayyagari et al., 2010).

Due to information cost, SMEs rely on internal funds or short-term loans as the primary source of financing, aligning with POT (López-Gracia & Sogorb-Mira, 2008). Unlike banks, MFIs and informal financial service providers may overcome information asymmetry between lenders and SMEs by using relationship- and reputation-based monitoring to enforce repayment. Additionally, in response to liquidity issues, SMEs rely more on trade credit provided by suppliers or advanced payments from customers than do large firms (Carbo-Valverde et al., 2016). According to Ceustermans et al. (2017), small firms benefit from voluntary financial disclosure as it reduces information asymmetry, consequently, leading to a substantial increase in trade credit.

The impacts of CER on capital structure and its components may vary among firms of various sizes. There are several arguments supporting this proposition. First, the benefits of CER are probably subject to firm characteristics, including firm size. According to Bromiley and Rau's (2014) practice-based view, environmental activities are imitable practices. The benefits of such activities depend on how firms implement them, their interaction with

other practices, and the responses of competitors. For small firms, owner-managers play a crucial role in environmental and other practices, indicating that the benefits of environmental practices and environmental risk are more subject to managers and other firm characteristics for small firms than for large firms. Different benefits of CER for large and small firms suggest that the impact of CER on financing options may depend on firm size.

Second, the theories underlying CER differ between small and large firms. The shareholder-expense view posits that environmental activities largely meet nonshareholder constituents' demand at the expense of shareholders (Moser & Martin, 2012), indicating that environmental activities may adversely affect firm access to financing. Conversely, the stakeholder-value-maximization view explains that environmental activities positively affect shareholder wealth because focusing on the interests of other stakeholders improves their commitments to support a firm's operation, which enhances shareholder wealth (Luo & Bhattacharya, 2009; Stoian & Plakoyiannaki, 2023). Small firms are closely linked to their stakeholders due to their size, enabling these firms to incorporate various stakeholders' social and environmental concerns into operational activities (Nejati et al., 2014; Stoian & Plakoyiannaki, 2023). Unlike large firms, in which the separation of owners and managers causes information asymmetry and high agency cost, small firms can easily elicit knowledge from managers about CER and can monitor their decisions on CER decisions. Collectively, small firms are more likely to incorporate stakeholders' environmental concerns into operational activities, which maximizes shareholders' value, implying a positive impact of environmental activities on small firms' credit access. The extensive scrutiny of stakeholders enhances the benefits of environmental practices for small firms (Lin et al., 2019). Additionally, Chang et al. (2021) find a more negative impact of environmental liability on the availability of bank credit for large firms than for SMEs.

Third, the impact of CER on financing through reduced environmental risk is contingent on agency problems between borrowers and lenders. Although small firms may integrate stakeholders' environmental concerns into their operational activities, they may not effectively convey environmental information to stakeholders, resulting in a diminished credibility of such information. According to the stakeholder-agency theory of debt financing, access to credit is restricted due to agency problems arising from information asymmetry and conflicting interests between borrowers and lenders, which exacerbates lending difficulties faced by small businesses (Simba et al., 2023). In general, small firms' lenders often face significant information asymmetry concerning environmental risk and other business risk factors, resulting in a higher adverse selection cost of debt compared to equity (Halov & Heider, 2011). For small firms, Tian and Lin (2019) document that financing requirements are high when they invest in environmental technology. Recently, Gjergji et al. (2021)

compare the impacts of environmental disclosures, among other social and governance disclosures, on the cost of capital. They find that the disclosure of environmental information raises SMEs' cost of capital due to the substantial risk associated with revealing sensitive information. This finding validates Edmans et al.'s (2016) argument that soft information plays a less important role in financing efficiency for SMEs.

Methods

Data description

We obtained data for the empirical analysis from the World Bank Enterprise Surveys (WBES). The goal of the WBES is to provide firm-level data on private-sector business environments around the world. The industrial sectors include most manufacturing and selected services, such as retail, wholesale, hospitality, and construction. Firms operating in agriculture, mining, and banking and finance are excluded from the sampling universe. The surveys employ a common questionnaire and a uniform stratified sampling methodology (with variables of geographic region, industry, and firm size) to generate a sample large enough to represent the private economy for each sample country.

Following the criteria adopted by the European Union (EU), smaller firms refer to those with fewer than 50 employees and an annual revenue of no more than EUR 10 million,⁴ while the rest of the sample firms are larger firms. Ayyagari et al. (2010) use a similar definition for smaller firms when applying WBES data to analyze firms' financing choices.

We restrict our analysis to the WBES sample firms without missing values for variables in model specifications and to sample countries without missing values for country-level variables. The final data set contains 15,082 firms across 27 countries. Table A1 in the appendix presents the sample distribution by country.

Table 1 Panel A reports the number of firms based on their use of financing sources for the entire sample, as well as smaller and larger firms. Table 1, Panel B, reveals significant differences between smaller and larger firms in terms of the proportions of investment financed internally and externally.

Key variables

The measures of CER vary among previous studies, depending on their scopes and data availability. In general, researchers work on large or public firms in developed countries and apply a vector of indicators to measure different

⁴The EU also uses the balance sheet total of no more than EUR 10 million as one of the criteria. However, the WBES does not incorporate survey inquiries regarding the balance sheet total.

Table 1. Sample distribution and financing patterns by firm size.

Variable	Panel A: No. of firms that used financing sources			Panel B: Financing proportion				
	Full sample	Smaller	Larger	Full sample	Smaller	Larger		
	No. of firms			Mean	SD	Mean	Mean	Δ
Financing sources of working capital								
Bank Loans	4,617	2,599	2,018	9.353	18.768	7.768	12.52	-4.75***
MFI Loans	540	286	254	0.681	4.927	0.529	0.986	-0.457***
Internal Funds	14,354	9,547	4,807	76.25	30.65	78.10	72.55	5.55***
Trade Credit	4,135	2,564	1,571	9.787	20.569	9.371	10.62	-1.25**
Grants	399	220	179	0.408	3.318	0.352	0.521	-0.169***
Bonds	185	81	104	0.203	2.310	0.110	0.386	-0.276***
Informal Finance	1,292	941	351	3.320	14.802	3.768	2.426	1.342***
Financing sources of fixed investment								
Internal Funds	4,034	2,199	1,835	21.20	38.11	17.82	27.95	-10.13***
Equity	396	204	192	1.015	7.833	0.859	1.327	-0.468***
Bank Loans	1,448	667	781	4.773	17.373	3.402	7.508	-4.106***
MFI Loans	156	69	87	0.393	5.051	0.284	0.611	-0.327**
Trade Credit	514	258	256	1.318	8.770	1.114	1.725	-0.612***
Grants	159	64	95	0.360	4.300	0.246	0.588	-0.342***
Bonds	17	2	15	0.013	0.465	0.002	0.034	-0.032***
Informal Finance	111	70	41	0.262	4.009	0.244	0.298	-0.054

** = significant at 5% level; *** = significant at 1% level.

aspects of CER. The individual measures are further conceptualized as a single unidimensional construct (e.g., Cai et al., 2016). In general, many countries lack a standardized criterion for CER or environmental performance for private firms. In this study, we measure CER based on energy efficiency measures. Production-generated emissions are the primary concern for firms regarding environmental risk and for decision-makers regarding environmental regulations (Aller et al., 2018; Bolton & Kacperczyk, 2021). Energy-efficiency investments aim to reduce the environmental impact of fossil fuels, which reflects a strength of environmental behavior and alleviates environmental concerns of financial institutions as well as other stakeholders. The dummy coding for CER is based on the survey question, “Over the last three years, did this establishment adopt any measures to enhance energy efficiency?” In the robustness checks, we use an alternative measure of CER.

In the surveys, firms answered questions about the proportions of their working capital for day-to-day operations or total purchases of fixed assets that were financed by various sources. Financing sources consist of internal funds or retained earnings (*Internal-Funds*) and external financial sources, such as banks (*Bank-Loans*), microfinance institutions and other nonbank financial institutions (*MFI-Loans*), trade credit from supplies and advances from customers (*Trade-Credit*), government grants (*Grants*), issued bonds (*Bonds*), and other sources such as moneylenders, friends, and relatives (*Informal-Finance*). For fixed assets, there is an additional financing source: firm owners’ contributions or issued new equity shares (*Equity*).

Models

Since the dependent variables (financing proportions) are percentage points ranging between 0 and 100, we apply a two-limit Tobit model as a primary econometric method. The baseline specification of the Tobit model is represented by

$$Y_i = \begin{cases} 0 & \text{if } Y_i^* \leq 0 \\ Y_i^* & \text{if } 0 < Y_i^* < 100 \\ 100 & \text{if } Y_i^* \geq 100 \end{cases} \quad (1)$$

$$Y_i^*(Z) = a_0 + a_1 CER_i + a_2 SMALLER_i + \sum_{k=1}^m b_k X_{k,i} + c_1 SERVICES_i + \sum_{k=1}^4 d_k REGION_{k,i} + U_i \quad (2)$$

where Y_i represents the observed proportion of investment in working capital or fixed assets financed by one of the financing sources (in percentage points)—namely, *Internal-Funds*, *Bank-Loans*, *MFI-Loans*, *Trade-Credit*, *Grants*, *Bonds*, and *Informal-Finance* for either working capital or fixed assets and *Equity* for fixed assets; Y_i^* is a latent variable corresponding to the observed financing proportion and can take any value; CER is a dummy variable and equals 1 for environmentally responsible firms and 0 otherwise; $SMALLER$ is a dummy for firms with fewer than 50 employees and annual income of no more than EUR 10 million; the dummy variables for regions and the service industry ($SERVICES$) control for heterogeneity in these two dimensions⁵; and U is a disturbance term.

To compare the joint impacts of CER and firm size on financing patterns, we modify the baseline model by including an interaction term between CER and $SMALLER$:

$$Y_i^*(Z) = a_0 + a_1 CER_i + a_2 SMALLER_i + a_3 CER^* SMALLER_i + \sum_{k=1}^m b_k X_{k,i} + c_1 SERVICES_i + \sum_{k=1}^4 d_k REGION_{k,i} + U_i \quad (3)$$

The models represented by Equations (3) and (4) assume the same impacts of control variables (X) on smaller and larger firms, which may be unrealistic. Finally, we exclude the variable $SMALLER$ from the baseline model

⁵For the entire sample and subsamples of smaller and larger firms, some countries and industries have limited observations (firms), leading to issues of multicollinearity or convergence. Therefore, we include regional dummies and a dummy for services in the models, following Gorodnichenko and Schnitzer (2013) and Beck et al. (2008). There are four regional dummies representing the old member states of the EU (OMS), new member states of the EU (NMS), other Central and Eastern European countries (CEE), and Commonwealth of Independent States (CIS), with the remaining sample countries as the base category. This categorization takes into account both geographic and economic development levels. Additionally, we use country-level variables to control heterogeneity. Regarding industry differences, we estimate the models with industry dummies as a robustness check. The estimation results for CER closely align with the main results.

specification and estimate the following model for the subsamples of smaller and larger firms separately:

$$Y_i^*(Z) = a_0 + a_1CER_i + \sum_{k=1}^m b_kX_{k,i} + c_1SERVICES_i + \sum_{k=1}^4 d_kREGION_{k,i} + U_i \tag{4}$$

For the control variables, the vector of X in the models, we follow the literature (e.g., Bach, 2014; Frank & Goyal, 2009; Kumar et al., 2017) and include both firm-specific variables and country-level variables in the model specification. See Table A2 in the appendix for the definitions of the variables and data sources. Table 2 reports descriptive statistics for variables used in the models for the entire sample, for smaller firms, and for larger firms.

Treatment effects

From the estimation results, several (un)conditional means can be calculated. Since the proportions of financial sources range between 0 and 100, it is useful to analyze the expected means of the observed proportions rather than those of the latent variables (Greene, 2000). The unconditional expected value of the observed proportion of a particular source of financing is

$$E(Y) = aF_a + b(1 - F_b) + (F_b - F_a)Z\beta - \sigma(f_b - f_a) \tag{5}$$

where a and b are the upper and lower limits (0 and 100), respectively; F_a and F_b are the cumulative probability functions at the two limit points, respectively; Z and β are a vector of all variables and their coefficients; f_a and f_b are the density functions. Both the cumulative probability functions and the density functions follow a standard normal distribution using the fitted value and the standard error of the residuals as proxies of mean and standard deviation, respectively.

For CER (or other dummy variables such as $SMALLER$), the average treatment effect (ATE) (or marginal effect) is expressed as:

$$ATE = E(Y|CER = 1) - E(Y|CER = 0) \tag{6}$$

Combining Equations (5) and (6) gives rise to

$$ATE = \Pr_1(b > Y > a)[E_1(Yb > Y > a) - E_0(Yb > Y > a)] + E_1(Yb > Y > a)[Pr_1(b > Y > a) - Pr_0(b > Y > a)] \tag{7}$$

where Pr_1 and Pr_0 are the probability of the proportion falling within the range for the CER dummy at the values of 1 and 0, respectively, and E_1 and E_0 are the expected proportions for the CER dummy at the values of 1 and 0, respectively.

Table 2. Summary statistics of control variables.

Variable	Full sample			Smaller firms			Larger firms		
	Mean	SD	Max.	Mean	SD	Max.	Mean	SD	Max.
Firm-level variables									
CER	0.286	0.452	1	0.231	0.421	1	0.396	0.489	1
SMALLER	0.666	0.472	1	14.37	22.84	90.56	13.76	19.81	90.56
FIRM-GROWTH	14.17	21.87	90.56	0.040	0.196	1	0.116	0.320	1
EXPORTER	0.065	0.247	1	0.040	0.195	1	0.183	0.386	1
FOREIGN-OWNED	0.087	0.282	1	0.506	0.500	1	0.682	0.466	1
COOPERATION	0.565	0.496	1	2.766	0.636	5.069	3.038	0.637	5.323
AGE	2.857	0.649	5.323	2.857	0.704	4.248	2.934	0.760	4.248
EXPERIENCE	2.882	0.724	4.248	0.359	0.480	1	0.324	0.468	1
TAX	0.347	0.476	1	5.859	1.998	12.121	4.172	1.573	11.778
CLUSTERING	5.296	2.029	12.121	0.622	0.485	1	0.532	0.499	1
COMPETITION	0.592	0.492	1	0.280	0.449	1	0.297	0.457	1
SMALL-CITY	0.286	0.452	1	0.212	0.409	1	0.205	0.404	1
MEDIUM-CITY	0.210	0.407	1	0.480	0.500	1	0.319	0.466	1
SERVICES	0.426	0.495	1						
Country-level variables									
GDP	9.148	0.775	10.452						
GDP-GROWTH	3.536	1.371	7.942						
PRIVATE-CREDIT	50.77	23.20	102.61						
INFLATION	4.941	4.507	16.332						
PROPERTY-RIGHTS	5.625	0.727	7.713						

As shown in Equation (7), ATE is decomposed into two parts. The first part represents the impact of CER on the expected financing proportion, weighted by the probability of the proportion falling within the range. The second part represents the impact of CER on the probability of the proportion falling within the range, weighted by the conditional expected value of the financing proportion. This decomposition is proposed by McDonald and Moffitt (1980) and further modified by Staub (2014). Following Staub (2014), the first part of ATE is labeled the intensive margin, and the second part is the extensive margin. While the extensive margin reveals whether CER is associated with firms' decisions to use one kind of financing source, the intensive margin reveals the impact of CER on the proportion of this financing source out of the total investments for working capital or fixed assets, given that it is chosen. Thus, we explore firms' capital structure decisions from the above two perspectives.⁶

Results

Main results for the full sample

Table 3 presents the estimation results of the 2-limit Tobit models for the full sample. Panel A of Table 3 for working capital shows that CER affects only bank loans and that smaller firms are significantly different from larger firms regarding internal funds, bank loans, and bonds. The significant coefficients suggest that environmentally responsible firms use more bank loans, and smaller firms use more internal funds and less bank and bond financing than larger firms. The extensive and intensive margins of *SMALLER* for internal funds have opposite signs, while its ATE is negative.

In Panel B of Table 3 for fixed assets, *CER* is significant and positive in all regressions, indicating that environmentally responsible firms differ from conventional firms regarding all finance sources for fixed investments. As shown in the lines at the bottom of the panel, CER has the greatest ATE on bank loans, followed by internal funds, trade credit, and equity. However, the estimated marginal effects of CER on grants and informal finance are negligible. The estimate of *SMALLER* indicates that smaller firms use less internal funds, fewer bank loans and MFI loans, and less trade credit to finance fixed assets.

Table 4 reports the estimation results with an interaction term between *SMALLER* and *CER*. The interaction term is significant only in the model of grants for working capital (Panel A) and in the model of internal funds for fixed assets (Panel B). While the interaction term is not consistently significant

⁶Regarding the pecking order theory, Frank and Goyal (2009) argue that the empirical issue is to test whether firms primarily use internal financing before using external financing, holding all else equal. Our methodology also addresses another issue about the probability of utilizing intern financing and various forms of external financing.

Table 3. Determinants of financing patterns for the full sample.

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
Panel A: Working capital.							
CER	-3.2205 [4.6533]	6.494*** [1.8179]	3.9971 [3.4429]	5.0463 [3.6075]	0.8989 [2.4952]	-0.1791 [5.5802]	-15.4007 [18.8068]
SMALLER	8.3774*** [2.1796]	-11.0374*** [1.7365]	-6.1617* [3.6884]	-4.9239* [2.8695]	-3.287 [3.9786]	-11.5429** [5.0674]	8.4374 [5.2939]
FIRM-GROWTH	-0.0579* [0.0329]	0.0346 [0.03]	0.1299** [0.0628]	0.0064 [0.0276]	0.0597 [0.0516]	0.144* [0.0898]	0.2243** [0.1044]
EXPORTER	-18.6085*** [3.9536]	12.3255*** [2.8627]	28.0973*** [2.8013]	18.7813*** [3.4756]	11.4751*** [3.8567]	28.9167*** [3.9457]	20.2682** [8.275]
FOREIGN-OWNED	9.0325** [4.2292]	-12.9064*** [3.3088]	5.138 [4.686]	-2.532 [3.1394]	-7.1544** [3.7089]	14.5878** [6.0799]	2.7689 [9.1031]
COOPERATION	4.679 [4.1475]	3.4737 [2.8701]	-1.6681 [5.3243]	-3.7435 [5.9488]	0.7234 [2.9571]	-9.972*** [3.6758]	-29.3908*** [11.1734]
AGE	-1.0037 [1.5105]	1.352 [1.1019]	1.0478 [1.7129]	-0.2595 [2.0016]	3.252 [2.3852]	2.0294 [3.2406]	-5.2275* [3.233]
EXPERIENCE	1.1074 [1.933]	-2.581** [1.2271]	-4.7312*** [1.7519]	-0.0647 [2.7588]	-0.034 [1.8584]	1.9011 [2.9752]	4.0309 [4.1583]
TAX	-7.7991*** [2.7705]	6.226** [3.1135]	-0.8685 [2.4014]	9.8535*** [3.3222]	-3.9558* [2.1678]	-5.6895*** [1.8741]	2.0141 [5.9565]
CLUSTERING	1.0175 [0.741]	-1.9106** [0.7624]	-1.5066* [0.8132]	0.6251 [0.7503]	1.7773 [1.7773]	-2.201* [1.1921]	-1.8816 [1.7786]
COMPETITION	7.2401 [4.9271]	-4.2631 [2.7212]	0.2562 [2.8687]	-1.3856 [3.3455]	-2.732 [2.1858]	2.9211 [3.5503]	-11.599 [16.2716]
SMALL-CITY	1.7881 [5.1957]	-2.1881 [2.4598]	-7.3441* [4.4108]	-5.2178 [7.2011]	8.3405** [4.2303]	-4.5252 [4.4385]	11.4669 [10.6959]
MEDIUM-CITY	-3.3198 [2.3903]	1.0034 [1.9898]	2.2776 [4.3397]	4.4426 [4.5648]	6.6789 [4.5283]	3.824 [3.824]	6.8782 [5.3392]
SERVICES	3.179 [2.9562]	-0.2535 [1.6406]	3.2962 [2.705]	-1.345 [2.7111]	-6.7182 [6.1142]	-0.0429 [2.3468]	-5.7745 [8.4628]
GDP	-3.0384 [5.6554]	7.9792* [4.4313]	11.2042** [5.425]	15.9378* [8.8976]	14.4989*** [2.2395]	11.0477** [5.0934]	-28.3818*** [10.2693]
GDP-GROWTH	-0.7228 [1.6347]	2.6097*** [0.7097]	-1.3177 [1.0924]	-1.8078 [3.167]	1.4513 [0.9317]	-0.0416 [1.3343]	-3.6225 [2.8121]
PRIVATE-CREDIT	-0.2024 [0.1401]	0.5657*** [0.1276]	0.3718*** [0.1283]	-0.1351 [0.2063]	0.1792** [0.0901]	0.3523*** [0.1077]	0.055 [0.1625]

(Continued)

Table 3. (Continued).

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
INFLATION	-0.4191 [0.8357]	-0.3495 [0.5069]	-0.5452 [0.5998]	0.9081 [1.2129]	1.0237*** [0.268]	1.426*** [0.5459]	1.1435 [0.9583]
PROPERTY-RIGHTS	0.9545 [5.066]	-3.2551 [3.929]	-3.6843 [5.3265]	-7.1336 [8.6286]	-7.4024*** [2.8046]	-1.9583 [5.375]	22.583** [9.7409]
OMS	2.5237 [15.3514]	-17.3955 [11.3813]	-38.42*** [14.2421]	12.5259 [22.9314]	-31.1116*** [8.1045]	-40.8655*** [14.4744]	-80.779** [31.8861]
NMS	-10.3675 [13.0766]	9.1047 [9.7105]	-9.3388 [12.1685]	19.8493 [19.3761]	-14.2712*** [5.2182]	-15.1258 [11.9432]	-43.6741** [20.8575]
CEE	-8.5217 [15.344]	17.9315** [7.2324]	-33.3896*** [11.2158]	10.7809 [24.4891]	-29.7795*** [8.0017]	-23.3263** [10.21]	-39.3878* [21.883]
CIS	-8.7094 [9.9142]	2.1371 [6.9876]	-17.2034** [8.3791]	21.9208 [14.4881]	-16.0351*** [4.7435]	-3.4104 [10.5328]	-4.0002 [17.8031]
Intercept	124.3044** [51.7993]	-100.5336** [43.1687]	-153.0183*** [57.878]	-143.1239* [85.6058]	-163.986*** [28.0166]	-179.5498*** [46.8793]	55.9886 [68.4495]
Log(scale)	4.0274*** [0.0966]	3.8026*** [0.049]	3.8585*** [0.1237]	4.0039*** [0.0885]	3.6344*** [0.0812]	3.7329*** [0.1243]	4.5157*** [0.2543]
Pseudo R ²	0.00645	0.02727	0.04125	0.01484	0.04425	0.09658	0.06333
Observations	15,082	15,082	15,082	15,082	15,082	15,082	15,082
CER							
ATE		4.3376					
Extensive margin		0.8926					
Intensive margin		3.4449					
SMALLER							
ATE		-4.9584					
Extensive margin		-1.5229					
Intensive margin		-3.4355					
Variable	Internal funds	Equity	Bank loans	MFI loans	Trade credit	Grants	Informal finance
Panel B: Fixed investment.							
CER	58.6535*** [16.5102]	24.4379*** [5.7111]	30.5169*** [4.9543]	19.3674** [7.5923]	24.9867*** [5.2652]	24.6694*** [7.2954]	19.1873** [9.1527]
SMALLER	-48.0788*** [11.2842]	-7.5454 [7.6983]	-41.3336*** [4.9548]	-25.9201*** [9.2551]	-16.3646*** [5.6206]	-17.4019* [10.0368]	9.2086 [11.1555]
FIRM-GROWTH	0.7504*** [0.1512]	0.3927*** [0.1286]	0.4341*** [0.0781]	0.4174*** [0.1505]	0.2246** [0.1036]	0.1459 [0.1182]	0.29* [0.17]

(Continued)

Table 3. (Continued).

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
EXPORTER	1.0958 [11.8964]	26.9063*** [8.692]	25.939*** [5.6697]	54.8438*** [10.3748]	29.6443*** [5.1032]	18.1415** [9.5803]	34.2677* [19.7798]
FOREIGN-OWNED	53.0013*** [7.6304]	13.2719 [8.7845]	-30.1031*** [7.616]	5.9648 [2.0624]	-0.8863 [8.7989]	-17.9819 [13.4457]	41.4142*** [12.985]
COOPERATION	49.0277*** [17.248]	1.4159 [7.7488]	14.2552** [6.1869]	18.0302 [13.4915]	-1.5392 [5.4028]	26.5798** [10.7194]	-22.1184* [13.8075]
AGE	-4.1548 [10.2473]	0.2041 [4.735]	-3.56 [2.8001]	1.8261 [6.0631]	-0.5372 [3.9424]	4.7366 [4.1215]	-13.9251* [7.4731]
EXPERIENCE	9.486 [8.9231]	-2.0177 [5.1699]	2.585 [2.7946]	-2.2033 [7.1826]	-5.8079* [3.3957]	-4.2217 [2.9712]	0.3515 [3.9038]
TAX	9.3924 [15.4495]	-1.7748 [7.0329]	6.0548 [4.2631]	-3.2012 [9.5892]	9.4992* [5.4403]	3.7964 [5.6914]	0.6771 [9.4149]
CLUSTERING	-2.2423 [2.7513]	-5.1326** [2.6755]	-0.1989 [0.8317]	0.8558 [2.7236]	-0.9415 [1.5812]	-5.3736*** [1.9983]	-2.7066 [3.0188]
COMPETITION	-3.7265 [12.8342]	-15.9879** [6.8868]	0.623 [5.4026]	-8.7848 [9.7316]	-3.3305 [6.2094]	-0.2906 [7.6748]	-16.3044* [9.1315]
SMALL-CITY	39.0037** [16.7507]	0.6464 [8.4869]	16.6874*** [5.6431]	-12.6827 [9.3803]	-5.0014 [5.9995]	26.1815** [10.7273]	16.2984 [10.4167]
MEDIUM-CITY	13.1878 [11.8416]	3.1125 [10.491]	9.9922** [5.0625]	0.8707 [14.2497]	3.9323 [6.3381]	9.9996 [8.6074]	0.1146 [12.0742]
SERVICES	-0.9664 [8.167]	-3.5158 [6.1906]	-3.8511 [3.7243]	15.1732** [6.7222]	1.7697 [5.972]	-41.3578*** [9.8013]	-2.0691 [9.027]
GDP	121.5576*** [27.5473]	14.8939 [9.9707]	35.5821*** [8.709]	46.1068** [22.6744]	61.1829*** [18.9975]	28.0026 [17.6315]	18.5576 [15.7447]
GDP-GROWTH	8.2322 [6.9671]	4.6437* [2.5095]	7.109*** [1.9204]	-2.2188 [4.1282]	-0.7002 [3.5807]	6.657 [6.3634]	-3.2877 [4.8709]
PRIVATE-CREDIT	0.8173 [0.5576]	0.6556** [0.2742]	0.9102*** [0.1666]	0.2609 [0.4182]	0.1152 [0.2468]	0.1181 [0.4252]	0.0932 [0.4419]
INFLATION	-3.458 [3.1201]	-3.364** [1.4176]	-1.748* [1.0503]	-7.8706** [3.1919]	-3.1139** [1.6434]	-0.5438 [2.7559]	-3.8475 [3.3621]
PROPERTY-RIGHTS	-12.1289 [15.6607]	1.0599 [9.3691]	-2.9948 [4.7418]	-13.3172 [10.3497]	-19.3616** [9.2329]	-8.6939 [9.2118]	16.8333 [11.6162]
OMS	-135.3793*** [68.3409]	-38.2209 [25.1218]	-48.4556** [19.5795]	-81.6966* [45.3372]	-44.3243 [29.9372]	-35.2871 [41.615]	-118.3617*** [35.992]
NMS	-3.6367 [60.4531]	-23.3706 [26.4071]	15.5712 [17.7531]	-25.5322 [26.3766]	-18.2821 [24.6618]	-6.0261 [25.3875]	-48.55 [45.037]

(Continued)

Table 3. (Continued).

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
CEE	166.5642*** [48.4226]	26.3241 [21.7864]	67.581*** [15.8178]	-21.236 [20.2581]	22.9271 [27.1449]	-12.2982 [28.6404]	-1.1685 [31.7413]
CIS	18.098 [52.9243]	-6.4871 [17.9662]	12.9663 [18.5236]	-74.7071** [29.5853]	13.585 [13.8446]	-60.5494** [26.1256]	4.1089 [30.1944]
Intercept	-1305.2442*** [227.5725]	-348.0522*** [85.3257]	-530.1602*** [65.5815]	-583.8635*** [187.6886]	-608.5056*** [183.8762]	-437.393*** [161.9982]	-455.4343*** [117.9685]
Log(scale)	5.4156*** [0.076]	4.6477*** [0.0815]	4.6341*** [0.0449]	4.7367*** [0.1529]	4.5953*** [0.1328]	4.5116*** [0.0569]	4.7542*** [0.1337]
Pseudo R ²	0.0595	0.0374	0.0548	0.0580	0.0455	0.0804	0.0379
Obs.	15082	15082	15082	15082	15082	15082	15082
CER							
ATE	2.8381	0.6811	3.0144	0.2356	0.9448		
Extensive margin	0.1911	0.0319	0.1684	0.0077	0.0434		
Intensive margin	2.6471	0.6492	2.8460	0.2279	0.9014		
Smaller							
ATE	-2.1522		-2.4887	-0.1976	-0.5620		
Extensive margin	-0.2087		-0.3596	-0.0180	-0.0616		
Intensive margin	-1.9434		-2.1290	-0.1795	-0.5005		

*** = $p < 10\%$, ** = $p < 5\%$, * = $p < 1\%$. Notes. Standard errors in brackets are clustered at the country level.

in most of the regressions, the significant coefficients of *SMALLER* may imply the joint significance of *SMALLER* and the interaction term. This suggests differences in financing choices between eco-friendly and conventional smaller firms. Therefore, we utilize separate regressions for smaller and larger firms to directly examine the impacts of CER on financing patterns for eco-friendly smaller firms (compared to conventional smaller firms) and for eco-friendly larger firms (compared to conventional larger firms).⁷

For firm-level control variables, *EXPORTER* and *FOREIGN-OWNED* significantly affect more than three types of financing sources for either working capital or fixed investment. For working capital, tax barriers negatively affect bank loans, indicating the role of interest-payment tax shields in capital structure. Shareholding firms have different financing patterns for fixed investment with regard to internal funds, bank loans, and grants compared to other types of firms. For country-level variables, the GDP affects several external financing sources for working capital and fixed assets. Firms in countries with a high level of private credit rely on bank loans to a greater extent when funding working capital.

Main results for smaller and larger firms

Tables 5 and 6 report the estimation results for smaller and larger firms, respectively.

For working capital, Panel A of Table 5 demonstrates that CER significantly affects the use of bank loans for smaller firms, consistent with Chang et al.'s (2021) findings that banks are more aware of environmental risk than other lenders. Panel A of Table 6 shows that, for larger firms, CER only significantly affects the use of grants for financing working capital. The values of ATE suggest that CER raises the proportion of bank loans for smaller firms and grants for larger firms by 3.58 and 0.15% points, respectively. Elsas et al.'s (2014) empirical results suggest that large firms issue securities to achieve target debt ratios when investing in large projects, which is probably irrelevant to working capital. Together, the estimation results indicate that CER does not consistently affect firms' financing patterns of working capital, regardless of firm size.

For fixed assets, CER is insignificant only in the regressions of grants and informal finance for larger firms (Panel B of Table 6). For all other regressions for larger firms and all regressions for smaller firms, CER is significant and positive, in line with the findings for the full sample and suggesting a positive association between CER and financing patterns of fixed assets, regardless of firm size. However, the magnitudes of CER's impacts differ between the two firm groups and vary across financing sources.

⁷Moreover, the models for the whole sample cannot reveal the different impacts of other control variables on financial choices for smaller and larger firms.

Table 4. Determinants of financing patterns for the full sample, with interaction terms between CER and SMALLER.

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
Panel A: Working capital.							
CER	-3.2436 [2.9561]	4.369** [2.2546]	5.5426** [2.8185]	4.0006 [2.5431]	5.041** [2.5568]	4.8753 [4.4678]	-12.4997 [16.4707]
SMALLER	8.3645*** [3.2503]	-12.3363*** [1.715]	-5.1365 [4.2388]	-5.529* [2.9687]	-5.529* [4.411]	-8.158 [5.2674]	9.5397 [5.9872]
CER*SMALLER	0.0393 [4.7753]	3.7312* [2.1748]	-2.9831 [4.071]	1.7721 [3.8659]	-8.1268** [4.2642]	-14.3309* [7.6882]	-4.651 [9.6326]
FIRM-GROWTH	-0.0328 [18.6072***]	0.0352 [0.0299]	0.1294** [0.0628]	0.0068 [0.0278]	0.059 [0.0512]	0.1417 [0.09]	0.2232** [0.1031]
EXPORTER	-18.6072*** [3.9428]	12.4403*** [2.8367]	28.0485*** [2.8198]	18.8399*** [3.4843]	11.2419*** [3.8425]	28.6393*** [4.1394]	20.1425** [8.0854]
FOREIGN-OWNED	9.0336** [4.2294]	-12.8233*** [3.2969]	5.0659 [4.7034]	-2.4763 [3.1132]	-7.3575** [3.6742]	14.1834** [6.1872]	2.5807 [9.2918]
COOPERATION	4.6786 [4.1288]	3.4509 [2.8755]	-1.6093 [5.2867]	-3.7634 [5.9523]	0.8854 [2.8946]	1.7886 [3.1961]	2.5807 [3.3136]
AGE	-1.003 [1.5359]	1.4177 [1.1024]	1.0028 [1.6887]	-0.2273 [2.0129]	3.0854 [2.3678]	3.0854 [3.1961]	-5.2898 [3.3136]
EXPERIENCE	1.1073 [1.9455]	-2.594** [1.2253]	-4.7225*** [1.7488]	-0.0735 [2.768]	-0.0281 [1.8663]	1.825 [2.9379]	3.9936 [4.1308]
TAX	-7.7989*** [2.7657]	6.2345** [3.1144]	-0.8725 [2.4087]	9.8634*** [3.3186]	-3.8752* [2.1692]	-5.589*** [1.8615]	2.0066 [5.947]
CLUSTERING	1.0176 [0.7479]	-1.9048** [0.7566]	-1.5079* [0.8148]	0.6278 [0.749]	-1.5511 [1.7645]	-2.1432* [1.2222]	-1.8865 [1.787]
COMPETITION	7.24 [4.9233]	-4.2594 [2.72]	0.248 [2.8587]	-1.3873 [3.3467]	-2.7956 [2.1859]	2.7708 [3.5095]	-11.6109 [16.2664]
SMALL-CITY	1.7887 [5.1645]	-2.1449 [2.4447]	-7.4002* [4.3897]	-5.1906 [7.1903]	8.2233** [4.2501]	-4.7979 [4.4912]	11.3765 [10.6083]
MEDIUM-CITY	-3.3193 [2.352]	1.0396 [1.9887]	2.2184 [4.3337]	4.4642 [4.5446]	6.5886 [4.492]	3.6024 [3.8805]	6.8079 [5.2767]
SERVICES	3.1789 [2.9464]	-0.2615 [1.6441]	3.312 [2.7283]	-1.3535 [2.7083]	-6.6723 [6.1358]	0.1339 [2.3894]	-5.7637 [8.445]
GDP	-3.0379 [5.6566]	8.0438* [4.4341]	11.1268** [5.365]	15.9605* [8.8922]	14.3709*** [2.2184]	10.6002** [4.9582]	-28.4797*** [10.3238]
GDP-GROWTH	-0.7228 [1.6343]	2.605*** [0.7081]	-1.3123 [1.091]	-1.8068 [3.1675]	1.4578 [0.9283]	-0.04 [1.3278]	-3.6143 [2.7955]

(Continued)

Table 4. (Continued).

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
PRIVATE-CREDIT	-0.2024 [0.1405]	0.5648*** [0.1274]	0.3727*** [0.1275]	-0.1358 [0.2058]	0.1803** [0.091]	0.3599*** [0.1054]	0.0573 [0.1621]
INFLATION	-0.4191 [0.8354]	-0.35 [0.5055]	-0.5493 [0.5996]	0.9084 [1.2114]	1.0125*** [0.2712]	1.4079*** [0.5408]	1.145 [0.9575]
PROPERTY-RIGHTS	0.9548 [5.0688]	-3.2482 [3.926]	-3.7055 [5.3315]	-7.122 [8.6223]	-7.477*** [2.8109]	-2.1107 [5.3672]	22.5529** [9.7187]
OMS	2.5235 [15.3538]	-17.4297 [11.3642]	-38.3948*** [14.2366]	12.5215 [22.9164]	-31.0844*** [8.0763]	-40.8403*** [14.4118]	-80.6833** [31.7671]
NMS	-10.3685 [13.1333]	9.0105 [9.6943]	-9.2356 [12.1101]	19.7917 [19.3986]	-14.0793*** [5.1504]	-14.419 [11.7155]	-43.4585** [20.6965]
CEE	-8.5221 [15.3582]	17.9004** [7.22]	-33.385*** [11.2272]	10.7636 [24.4985]	-29.8622*** [7.8954]	-22.8583** [10.1301]	-39.311* [21.8281]
CIS	-8.7087 [9.8739]	2.1901 [6.9857]	-17.267** [8.3652]	21.9534 [14.4664]	-16.254*** [4.7584]	-3.8309 [10.4946]	-4.1107 [17.6841]
Intercept	124.3069** [51.8052]	-100.4** [43.2373]	-152.791*** [57.7343]	-143.0102* [85.6388]	-163.9124*** [27.8957]	-176.6443*** [46.1287]	56.3097 [68.505]
Log(scale)	4.0274*** [0.0966]	3.8025*** [0.049]	3.8583*** [0.1237]	4.0038*** [0.0886]	3.6333*** [0.0813]	3.7314*** [0.125]	4.5156*** [0.2541]
Pseudo R ²	0.00645	0.02732	0.0413	0.01485	0.04496	0.09805	0.06335
Observations	15,082	15,082	15,082	15,082	15,082	15,082	15,082
Variable	Internal funds	Equity	Bank loans	MFI loans	Trade credit	Grants	Informal finance
Panel B: Fixed investment.							
CER	70.5635*** [17.4664]	22.7874** [10.0739]	33.5511*** [5.6446]	18.966** [9.3773]	21.7457*** [8.3398]	21.4021** [10.0078]	23.3941 [16.5749]
SMALLER	-40.1826*** [12.474]	-8.8367 [10.5097]	-38.915*** [5.3257]	-26.2746** [11.9522]	-18.9409** [7.831]	-20.8017 [13.4058]	12.1431 [15.3205]
CER*SMALLER	-20.8202** [11.0664]	3.023 [12.3744]	-5.782 [5.3973]	0.8165 [12.086]	5.9687 [9.2964]	6.8386 [11.2197]	-6.9258 [21.1448]
FIRM-GROWTH	0.7458*** [0.1524]	0.3934*** [0.129]	0.4328*** [0.0782]	0.4176*** [0.1506]	0.2266** [0.105]	0.1481 [0.1185]	0.2883* [0.1714]
EXPORTER	0.4495 [11.6524]	27.0257*** [8.5864]	25.8072*** [5.6778]	54.8654*** [10.3302]	29.8096*** [5.0125]	18.3046* [9.7576]	34.1857* [19.7566]
FOREIGN-OWNED	52.6062*** [7.6404]	13.317 [8.8127]	-30.2544*** [7.6371]	5.978 [12.0338]	-0.6888 [8.7128]	-17.7619 [13.3766]	41.2729*** [13.0383]

(Continued)

Table 4. (Continued).

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
COOPERATION	49.1658** [17.2868]	1.3884 [7.7182]	14.2584** [6.1799]	18.0257 [13.468]	-1.5921 [5.3885]	26.5092** [10.7358]	-22.0503 [13.8973]
AGE	-4.5529 [10.1933]	0.2585 [4.6804]	-3.6649 [2.796]	1.8405 [5.9947]	-0.4231 [3.9223]	4.8946 [4.8882]	-14.0317* [7.573]
EXPERIENCE	9.5865 [8.9282]	-2.0199 [5.1679]	2.6104 [2.7969]	-2.2077 [7.192]	-5.847* [3.4102]	-4.2754 [2.9356]	0.3636 [3.92]
TAX	9.3239 [15.348]	-1.7627 [7.02]	6.05 [4.2542]	-3.1992 [9.5892]	9.5475* [5.4404]	3.7245 [5.705]	0.7075 [9.4253]
CLUSTERING	-2.299 [2.741]	-5.1262** [2.6678]	-0.2185 [0.8406]	0.8569 [2.7213]	-0.9207 [2.0157]	-5.3483*** [2.157]	-2.7343 [3.0608]
COMPETITION	-3.6991 [12.7838]	-15.9778** [6.8885]	0.631 [5.3954]	-8.7872 [9.7207]	-3.3662 [6.2087]	-0.2887 [7.6537]	-16.3386* [9.1372]
SMALL-CITY	38.7581** [16.6815]	0.6808 [8.4981]	16.6211*** [5.6199]	-12.6757 [9.3733]	-4.9476 [5.9572]	26.2231** [10.6954]	16.2822 [10.4109]
MEDIUM-CITY	12.9755 [11.8345]	3.1663 [10.4537]	9.8936** [5.0266]	0.8814 [14.2471]	3.9984 [6.2922]	9.9764 [8.6118]	0.0976 [12.0581]
SERVICES	-0.8927 [8.1339]	-3.53 [6.1811]	-3.815 [3.723]	15.1759** [6.7167]	1.7388 [5.9804]	-41.376*** [9.7975]	-2.0103 [8.9536]
GDP	121.1992*** [27.574]	14.9735 [10.0401]	35.4839*** [8.6668]	46.1207** [22.7123]	61.3501*** [18.9931]	28.2415* [17.6613]	18.3975 [15.7044]
GDP-GROWTH	8.2585 [6.9782]	4.6298* [2.5058]	7.1249*** [1.9191]	-2.2214 [4.1107]	-0.697 [3.5784]	6.6774 [6.3704]	-3.293 [4.8776]
PRIVATE-CREDIT	0.8242 [0.5574]	0.6535** [0.2722]	0.9115*** [0.1664]	0.2605 [0.4169]	0.1135 [0.2453]	0.1158 [0.4242]	0.098 [0.4405]
INFLATION	-3.4535 [3.113]	-3.3603** [1.4154]	-1.7494* [1.0493]	-7.8676** [3.1661]	-3.1027** [1.6348]	-0.5305 [2.7444]	-3.861 [3.3723]
PROPERTY-RIGHTS	-12.2567 [15.6102]	1.0775 [9.3702]	-3.038 [4.7466]	-13.3119 [10.3242]	-19.3647** [9.2222]	-8.728 [9.2102]	16.8404 [11.6247]
OMS	-135.3041** [68.1874]	-38.1803 [25.1056]	-48.4649** [19.5486]	-81.6699* [45.1891]	-44.2925 [29.8792]	-35.1754 [41.5471]	-118.5533*** [36.2027]
NMS	-3.0905 [60.4721]	-23.44 [26.3843]	15.6971 [17.7077]	-25.5342 [26.3822]	-18.4082 [24.6629]	-6.1587 [25.4925]	-48.3903 [44.913]
CEE	166.6261*** [48.4729]	26.335 [21.7823]	67.5649*** [15.8176]	-21.2213 [20.1137]	22.9442 [27.121]	-12.1524 [28.5544]	-1.136 [31.6899]
CIS	17.6343 [52.9296]	-6.3631 [18.0348]	12.8387 [18.4968]	-74.6885** [29.419]	13.747 [13.7289]	-60.3826** [26.0319]	3.7691 [30.5656]

(Continued)

Table 4. (Continued).

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
Intercept	-1305.8477*** [227.5414]	-348.1119*** [85.4999]	-530.255*** [65.4261]	-583.8569*** [187.6577]	-608.7193*** [183.8496]	-437.9797*** [162.1271]	-455.817*** [117.7601]
Log(scale)	5.4153*** [0.0761]	4.6477*** [0.0813]	4.634*** [0.0449]	4.7368*** [0.1529]	4.5953*** [0.1328]	4.5114*** [0.0567]	4.754*** [0.1337]
Pseudo R ²	0.0596	0.0374	0.0548	0.0580	0.0455	0.0805	0.0380
Obs.	15082	15082	15082	15082	15082	15082	15082

*** = $p < 10\%$, ** = $p < 5\%$, * = $p < 1\%$. Notes. Standard errors in brackets are clustered at the country level.

Table 5. Determinants of financing patterns for smaller firms.

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
Panel A: Working capital.							
CER	-3.7637 [6.204]	8.6096*** [2.0347]	2.656 [4.6939]	5.627 [4.9407]	-3.8725 [4.0131]	-8.373 [7.384]	-16.7943 [21.1953]
FIRM-GROWTH	-0.0586 [0.0449]	0.0503 [0.0364]	0.108 [0.0718]	-0.0176 [0.0334]	0.0999 [0.0686]	0.0323 [0.0634]	0.1515 [0.1038]
EXPORTER	-17.089*** [4.8895]	12.5235*** [3.767]	29.8842*** [4.8031]	21.987*** [5.8334]	15.0039*** [5.5989]	24.3159*** [3.4614]	10.7977 [11.3026]
FOREIGN-OWNED	7.8961 [5.6067]	-11.7605*** [3.8422]	10.7312 [7.8263]	-1.1093 [5.1941]	6.4662 [5.4334]	19.9362*** [5.6123]	-4.0751 [14.3725]
COOPERATION	4.3483 [4.8571]	3.2997 [3.8023]	-1.5421 [5.9586]	-2.3882 [6.4422]	2.8192 [3.3156]	-4.5267* [2.4902]	-31.4853** [13.6854]
AGE	0.8343 [2.2213]	1.0487 [1.3231]	-1.1654 [2.016]	-1.9252 [2.4781]	1.8623 [3.003]	-4.9466*** [1.3453]	-10.5511** [5.0948]
EXPERIENCE	-1.0437 [2.6769]	-3.1899*** [1.6713]	-2.5092 [2.5873]	1.5275 [3.2205]	-2.4259 [3.4643]	-6.4881*** [1.4496]	6.2981 [8.3603]
TAX	-8.7946*** [2.7596]	5.8397* [3.2493]	0.3671 [2.5473]	11.8034*** [3.6767]	-0.5336 [2.7457]	1.5333 [2.8995]	7.1628 [5.0224]
CLUSTERING	0.7746 [0.8668]	-1.6181** [0.8172]	-2.1284** [0.8389]	1.0651 [0.7432]	-1.4635 [1.8262]	-0.3597 [1.2274]	-2.7072 [1.9356]
COMPETITION	8.6961 [5.6578]	-4.9919 [3.4207]	2.9126 [3.0461]	-0.3871 [3.9559]	-2.043 [2.6174]	3.1082 [3.5716]	-15.5324 [18.0046]
SMALL-CITY	3.08 [5.4668]	-4.3331 [3.2625]	-9.313* [5.2421]	-4.4979 [7.8911]	9.0153 [5.6955]	-4.595 [5.1401]	11.7323 [10.4502]
MEDIUM-CITY	-1.2666 [2.1663]	1.0739 [2.544]	1.0739 [5.3485]	5.0893 [5.4077]	7.9431* [4.5227]	8.0095* [4.8935]	5.9129 [4.749]
SERVICES	5.9201 [3.8954]	-1.9301 [1.8016]	3.1584 [3.3095]	-4.2501 [3.3751]	-7.1229 [7.3648]	0.9612 [2.4555]	-6.8757 [9.2748]
GDP	-0.3645 [6.984]	8.7506* [5.0681]	14.4949** [6.041]	16.3285* [10.0657]	12.9483*** [3.1177]	5.9021 [5.2483]	-32.7763*** [10.9478]
GDP-GROWTH	-0.2235 [1.8729]	2.5324*** [0.8491]	-1.0524 [1.1241]	-2.0027 [3.3833]	2.2422* [1.2062]	1.3649* [0.8459]	-2.9584 [3.3438]
PRIVATE-CREDIT	-0.2502 [0.1609]	0.6577*** [0.1331]	0.4875*** [0.1569]	-0.1109 [0.2396]	0.3005** [0.1178]	0.5352*** [0.1088]	0.1041 [0.1621]
INFLATION	-0.6241 [1.0086]	-0.4 [0.5604]	-0.6151 [0.5914]	1.5422 [1.4981]	1.2556** [0.5247]	2.025*** [0.5787]	0.8797 [0.8466]
PROPERTY-RIGHTS	1.2006 [5.5391]	-3.6446 [5.1499]	-5.2778 [6.0985]	-9.974 [9.419]	-6.9973* [3.8896]	-2.0756 [4.9542]	24.7506*** [11.3693]

(Continued)

Table 5. (Continued).

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
OMS	2.2486 [18.4838]	-18.8239 [14.0468]	-47.5497*** [17.231]	14.5034 [27.3693]	-30.9039*** [11.408]	-35.9809*** [14.0191]	-94.0507** [40.7136]
NMS	-15.4147 [15.2023]	10.0448 [10.9789]	-10.7106 [13.3354]	28.8388 [21.5124]	-14.3677* [8.3888]	-1.3922 [10.1945]	-42.4109** [21.0615]
CEE	-10.8044 [18.0858]	20.6678*** [7.6408]	-32.8875** [13.7347]	17.173 [27.1757]	-27.4845*** [10.3191]	-6.6016 [11.7127]	-52.5253** [26.5856]
CIS	-10.1779 [11.8253]	3.0411 [6.7502]	-21.9417** [8.9357]	25.9105 [17.5625]	-22.3591*** [6.6483]	-16.5142* [10.2648]	-13.3875 [16.6843]
Intercept	112.0412** [59.2854]	-120.9959** [53.7875]	-185.5421*** [71.4828]	-149.7488* [92.5038]	-173.9701*** [38.4472]	-133.5839*** [45.8835]	97.3885 [83.1112]
Log(scale)	4.0771*** [0.1027]	3.861*** [0.0538]	3.882*** [0.1515]	4.053*** [0.0904]	3.7039*** [0.1178]	3.4538*** [0.1031]	4.5537*** [0.2615]
Pseudo R ²	0.00487	0.02591	0.04143	0.0157	0.04533	0.14631	0.06428
Observations	10,047	10,047	10,047	10,047	10,047	10,047	10,047
CER							
ATE		3.5833					
Extensive margin		0.6683					
Intensive margin		2.9150					
Variable	Internal funds	Equity	Bank loans	MFI loans	Trade credit	Grants	Informal finance
Panel B: Fixed investment.							
CER	275.5448*** [47.6754]	85.2503*** [17.0188]	122.7524*** [11.169]	109.1975*** [19.1499]	77.9241*** [15.6364]	68.3738*** [10.343]	76.053*** [21.8894]
FIRM-GROWTH	0.7707*** [0.2497]	0.3003* [0.1623]	0.3368** [0.1396]	0.1987 [0.2739]	0.2271* [0.1358]	-0.0611 [0.211]	-0.0717 [0.2329]
EXPORTER	27.2187 [23.9166]	17.2183 [13.0875]	19.8213** [8.821]	54.5346*** [19.0164]	31.6526*** [11.8482]	21.1523 [16.8296]	26.785 [18.6804]
FOREIGN-OWNED	18.3735 [18.117]	6.367 [14.507]	-28.1561** [11.3725]	24.7753 [29.2164]	16.1628 [13.476]	-43.5134 [34.7166]	49.1573*** [19.7199]
COOPERATION	42.9724** [21.5827]	-2.1478 [12.0231]	11.5738 [7.7504]	2.335 [14.2899]	-6.4406 [8.2219]	43.4085*** [17.2788]	30.8825** [14.3439]
AGE	-6.9867 [17.6202]	-0.0496 [7.0136]	-9.5195* [5.3509]	-4.3242 [9.6068]	-9.2138* [5.7401]	-12.7798** [6.4621]	-16.1416 [12.0853]
EXPERIENCE	1.4015 [13.6454]	-4.9163 [7.1056]	0.683 [4.2824]	1.6716 [14.7273]	-4.5217 [4.8443]	-5.412 [6.275]	-5.2524 [6.8298]
TAX	16.3355 [23.7258]	2.5572 [10.2167]	3.3133 [6.9784]	-9.7175 [15.4986]	9.2738 [8.8218]	5.334 [8.8148]	-10.8469 [10.5603]
CLUSTERING	0.6153	-6.5654*	1.3314	0.431	-1.7856	-4.16*	-1.7956

(Continued)

Table 5. (Continued).

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
COMPETITION	[3.4502] -1.245 [15.4891]	[3.9244] -17.619* [10.4948]	[1.4648] 2.9905 [6.5582]	[3.5761] 2.4531 [11.1341]	[2.1413] 6.3119 [8.1037]	[2.4932] -5.9388 [7.8505]	[3.0284] -10.5074 [8.7235]
SMALL-CITY	41.2506** [21.1749]	[13.0991] [16.4926]	[10.2068] [8.6937]	-15.8607* [13.1264]	-3.4695 8.3743]	33.347* [20.6828]	13.6241 [14.6216]
MEDIUM-CITY	[20.5947 [19.4982]	5.099 [16.4926]	12.3236 [8.6937]	-10.4683 [19.4324]	3.9003 [9.3299]	29.4821* [15.9426]	15.5923 [14.0478]
SERVICES	-10.8284 [11.0596]	-6.9185 [8.2792]	-12.7899** [5.273]	11.7286 [11.3459]	1.2946 [8.5345]	-37.2037*** [14.3903]	-4.1908 [9.1923]
GDP	151.2486*** [32.8341]	37.9321* [20.996]	38.0186*** [11.8098]	14.1504 [30.9035]	91.4411*** [29.1738]	13.1107 [23.8754]	10.2831 [17.7686]
GDP-GROWTH	9.5098 [8.0669]	11.864*** [3.4495]	6.4992*** [1.7753]	-0.6472 [7.3964]	2.1166 [4.5893]	11.5795 [8.1025]	-7.3988 [5.6345]
PRIVATE-CREDIT	0.7455 [0.5806]	0.3279 [0.4198]	0.989*** [0.2279]	-2.0188* [1.1177]	0.0064 [0.4117]	0.0849 [0.6284]	0.2613 [0.4418]
INFLATION	-5.322* [2.9009]	-8.8825*** [2.754]	-1.4985 [1.0733]	-30.7522*** [11.7653]	2.5638 [2.7514]	-1.782 [4.6543]	-1.2306 [3.7419]
PROPERTY-RIGHTS	-1.5702 [16.2225]	18.6512 [12.3095]	2.6678 [8.1574]	21.3014 [16.901]	-27.4863** [12.5002]	-3.5608 [12.8639]	21.413* [11.8241]
OMS	-196.8379*** [74.0786]	-97.0454** [47.6099]	-68.2936*** [23.1555]	-31.1336 [66.4997]	-35.7033 [46.0335]	-26.9158 [57.4423]	-99.933** [47.3717]
NMS	-52.2308 [61.3477]	-94.6561* [51.2206]	7.9035 [17.9514]	-70.4057 [48.2391]	-15.5598 [29.6954]	-2.1398 [34.2528]	-16.9282 [55.8603]
CEE	164.4832*** [42.3556]	13.8643 [26.3306]	73.6231*** [15.3697]	-66.4416 [42.5194]	33.9688 [37.4501]	-6.2634 [44.946]	-6.2634 [40.2186]
CIS	20.2363 [58.1909]	-25.3077 [20.5436]	27.006** [13.4207]	-72.3637* [43.2041]	37.4551* [21.6971]	-76.568* [43.6978]	27.7067 [42.1577]
Intercept	-1733.9949*** [304.221]	-633.3603*** [204.4995]	-653.7659*** [108.1893]	-353.7437 [258.3631]	-906.0094*** [271.9725]	-380.244* [218.3716]	-395.915*** [131.4318]
Log(scale)	5.6207*** [0.0788]	4.7318*** [0.0877]	4.7683*** [0.0614]	4.8589*** [0.1634]	4.7601*** [0.1485]	4.6837*** [0.1209]	4.7105*** [0.1763]
Pseudo R ²	0.06352 10047	0.05801 10047	0.05551 10047	0.06959 10047	0.05337 10047	0.08273 10047	0.04961 10047
Obs.							
CER							
ATE	1.8288	0.4629	1.8111	0.1087	0.7068	0.1755	0.0724
Extensive margin	0.0905	0.0185	0.0893	0.0026	0.0254	0.0044	0.0034
Intensive margin	1.7384	0.4443	1.7218	0.1061	0.6814	0.1711	0.0690

*** = $p < 10\%$; ** = $p < 5\%$; * = $p < 1\%$. Notes. Standard errors in brackets are clustered at the country level.

Table 6. Determinants of financing patterns for larger firms.

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
Panel A. Working capital.							
CER	-1.8875 [3.326]	3.8638* [2.286]	5.2494* [3.0871]	3.8656 [2.583]	5.0044** [2.5449]	2.6822 [5.9238]	-14.2754 [15.9167]
FIRM-GROWTH	-0.0542 [0.0341]	0.0035 [0.0429]	0.157 [0.1138]	0.0404 [0.0441]	-0.013 [0.0624]	0.2523* [0.1345]	0.3889** [0.1788]
EXPORTER	-19.7782*** [4.7126]	12.3748*** [2.9046]	25.8779*** [4.1141]	15.9273*** [4.8012]	8.7357*** [3.3089]	31.1027*** [4.788]	26.4391*** [8.5545]
FOREIGN-OWNED	9.6553** [4.8463]	-12.2861*** [3.5302]	2.891 [3.6932]	-3.1295 [3.5129]	-12.6001*** [4.3898]	12.6519** [6.4344]	7.4954 [9.0648]
COOPERATION	3.3861 [3.2129]	3.7446 [2.4212]	-0.6096 [5.4648]	-5.2549 [5.6859]	-1.8956 [4.1605]	-12.9922*** [4.0993]	-20.8417*** [8.4992]
AGE	-2.8703 [1.8893]	2.3431* [1.327]	2.8805 [2.5714]	1.3916 [2.4517]	4.1386** [2.1002]	10.9746** [5.0749]	2.7833 [3.0938]
EXPERIENCE	3.5917** [1.6658]	-1.7347 [1.208]	-6.3929*** [1.7248]	-1.998 [3.053]	-4.6241*** [1.2673]	-2.9502 [2.6616]	-4.3761 [3.4605]
TAX	-6.2174* [3.5502]	6.8236** [3.4345]	-2.2431 [4.0279]	6.8736** [3.3294]	0.7934 [2.0585]	0.9849 [4.2956]	-3.498 [9.2319]
CLUSTERING	1.4505** [0.7176]	-2.344*** [0.8445]	0.023 [0.9566]	-0.0358 [0.8955]	-1.7179 [2.0854]	-4.7049*** [1.2334]	0.5291 [1.8355]
COMPETITION	4.8752 [3.8028]	-3.4136 [2.2528]	-2.4244 [3.7169]	-2.7234 [2.9294]	-3.4338 [2.3509]	2.5731 [5.1491]	-3.4422 [12.0922]
SMALL-CITY	-0.8325 [5.4704]	1.4348 [3.1576]	-4.1578 [5.2172]	-4.4021 [6.3848]	8.0406* [4.2823]	-1.7704 [5.1777]	11.0258 [13.2366]
MEDIUM-CITY	-7.1538* [4.1346]	5.4213* [3.0532]	4.8859 [3.7739]	4.6241 [3.7396]	5.5772 [5.5665]	0.7872 [5.5423]	7.5932 [13.9112]
SERVICES	-1.9709 [2.5264]	2.2642 [2.4473]	3.8099 [3.5116]	3.1515 [3.646]	-6.599 [4.9164]	-3.1618 [3.4699]	-0.7145 [6.4036]
GDP	-6.4975* [4.0628]	7.4747* [4.1655]	4.116 [5.4813]	13.9273** [7.2474]	15.0511*** [2.3881]	10.3913** [4.9013]	-23.846** [10.3053]
GDP-GROWTH	-1.4634 [1.4261]	2.5884*** [0.8424]	-1.7765 [1.765]	-1.4336 [3.1394]	0.5798 [1.0232]	-1.1072 [2.0968]	-4.2781* [2.3525]
PRIVATE-CREDIT	-0.1603 [0.1279]	0.434*** [0.1302]	0.1854 [0.1267]	-0.1829 [0.1695]	0.0137 [0.0784]	0.1399 [0.1092]	0.0499 [0.1926]
INFLATION	-0.0623 [0.6971]	-0.4062 [0.4745]	-0.5498 [0.6956]	0.0872 [0.8406]	0.8013*** [0.1735]	0.2525 [0.4558]	1.7494 [1.187]
PROPERTY-RIGHTS	0.2316 [4.4941]	-2.4634 [2.9347]	-1.3917 [5.1155]	-2.8031 [7.8294]	-7.9633*** [3.0238]	-2.4993 [5.9184]	16.398* [9.2269]
OMS	5.3741	-18.2955*	-23.7965*	10.5651	-29.4843***	-45.0298***	-55.6126**

(Continued)

Table 6. (Continued).

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
NMS	[11.3871] -2.6682 [11.2001]	[9.7768] 5.985 [9.0934]	[14.0996] -5.7126 [12.1093]	[17.7784] 7.1391 [17.7762]	[6.784] -12.8658*** [4.7097]	[14.2222] -23.0225* [13.5978]	[28.076] -39.6545* [23.6634]
CEE	-5.5617 [12.5651]	12.9982* [7.5435]	-3.28614** [12.9683]	2.2735 [20.8924]	-31.6876*** [6.9517]	-39.5026** [15.8737]	-17.2474 [20.9606]
CIS	[8.0594] 154.6002***	[7.5961] -94.6643***	[9.5661] -95.5086**	[10.3693] -129.2029*	[4.5419] -144.7042***	[10.0508] -183.1897***	10.6681 28.6266
Intercept	[43.4586] 3.9372***	[37.4355] 3.7196***	[49.5965] 3.7956***	[76.8555] 3.9112***	[31.5653] 3.5253***	[52.22] 3.8602***	[69.6855] 4.3971***
Log(scale)	[0.0834] 0.00718	[0.047] 0.01867	[0.1235] 0.03682	[0.0911] 0.01434	[0.0659] 0.04675	[0.1206] 0.07212	[0.2283] 0.0636
Observations	5,035	5,035	5,035	5,035	5,035	5,035	5,035
CER							
ATE					0.1477		
Extensive margin					0.0293		
Intensive margin					0.2353		
Variable	Internal funds	Equity	Bank loans	MFI loans	Trade credit	Grants	Informal finance
Panel B: Fixed investment.							
CER	55.822*** [14.0629]	23.4036*** [7.4911]	27.9917*** [5.2271]	19.4366** [8.6416]	18.786*** [6.2708]	16.464* [9.2444]	21.9849 [16.7838]
FIRM-GROWTH	0.5019*** [0.172]	0.413*** [0.1493]	0.4201*** [0.1152]	0.5706*** [0.2055]	0.1397 [0.1225]	0.277** [0.1249]	0.816** [0.3625]
EXPORTER	-15.1949 [10.3592]	25.9419*** [8.748]	24.5394*** [6.0214]	49.2625*** [10.5869]	23.7566*** [5.6805]	15.394* [9.5056]	42.0303** [20.3575]
FOREIGN-OWNED	53.1049*** [8.7579]	13.9772 [9.1323]	-27.6172*** [7.3933]	-1.5691 [8.7447]	-4.9426 [7.6716]	-12.2711 [11.4999]	46.0831** [18.3139]
COOPERATION	49.657*** [14.7583]	-2.8464 [8.0809]	15.508** [7.8539]	25.3101 [16.2486]	0.0606 [7.9832]	11.3279 [9.6614]	-1.7066 [18.9758]
AGE	3.4232 [6.3765]	2.7768 [5.1286]	3.3244 [4.0902]	4.5148 [6.7288]	7.7993 [5.0118]	14.6808** [6.2271]	-6.7779 [10.026]
EXPERIENCE	13.3294* [7.3407]	-0.9002 [5.3106]	3.0202 [2.691]	-6.0811 [6.7779]	-6.0267 [4.048]	-1.8019 [3.7562]	7.018 [11.6987]
TAX	0.1605 [10.3777]	-3.4595 [7.1307]	9.2586** [4.1164]	0.021 [8.4685]	8.085 [5.38]	2.0619 [5.7776]	18.346 [15.8184]

(Continued)

Table 6. (Continued).

Variable	Internal funds	Bank loans	MFI loans	Trade credit	Grants	Bonds	Informal finance
CLUSTERING	-3.9994 [2.7835]	-1.155 [2.121]	-0.8664 [1.4843]	2.1971 [2.7133]	0.1586 [2.3703]	-8.1877** [3.1911]	-4.4719 [6.0462]
COMPETITION	-5.5965 [12.5547]	-12.4778* [6.8751]	-1.1825 [6.5215]	-13.7298 [13.2183]	-10.8342 [7.4485]	4.269 [9.5111]	-28.8971* [17.0218]
SMALL-CITY	30.6006** [13.8456]	6.4158 [9.8912]	16.445** [6.6134]	-11.5768 [13.6852]	-5.3971 [8.1185]	21.8387** [9.1493]	17.5424 [22.7984]
MEDIUM-CITY	5.6025 [9.4987]	-0.4886 [1.08465]	7.6996 [6.6225]	11.1265 [15.6012]	4.4927 [8.8339]	-8.9647 [9.5779]	-47.4859 [30.769]
SERVICES	17.5259* [9.5462]	2.8583 [9.7486]	6.5561 [6.3401]	18.7349*** [9.7645]	3.857 [7.2923]	-51.4296*** [9.398]	-1.0354 [17.9289]
GDP	87.8528*** [21.1067]	-6.3529 [6.3529]	31.3746*** [7.6352]	54.375*** [19.8526]	37.838*** [13.3705]	38.0944** [16.7243]	23.4524 [16.7462]
GDP-GROWTH	6.0639 [5.9241]	-2.3097 [3.1973]	7.6112*** [2.5823]	-4.9967 [3.2019]	-2.4339 [3.7065]	3.7888 [6.708]	5.6679 [5.456]
PRIVATE-CREDIT	0.6686 [0.5104]	0.696*** [0.1905]	0.7308*** [0.1813]	0.5836* [0.3598]	-0.0037 [0.2011]	0.0864 [0.3419]	-0.6143 [0.5061]
INFLATION	-1.0522 [3.0115]	-0.204 [1.398]	-1.6305 [1.2967]	-5.7131** [2.4356]	-2.5107** [1.2453]	-0.9599 [1.9812]	-10.1039** [4.2976]
PROPERTY-RIGHTS	-13.0737 [13.8388]	-9.7011 [9.7991]	-4.3067 [4.6952]	-24.0794*** [9.3515]	-9.9659 [7.8077]	-11.6851 [8.5765]	9.0272 [18.2927]
OMS	-90.234 [59.2066]	-2.4233 [23.1954]	-37.6853* [23.0944]	-116.6894*** [42.8769]	-40.9447* [24.6037]	-49.9738 [37.0473]	-135.9858** [53.7694]
NMS	26.5521 [54.8918]	24.2158 [19.1898]	15.1434 [20.7537]	-23.6276 [24.4442]	-18.9783 [25.6121]	-14.715 [27.2245]	-12.53173*** [46.3968]
CEE	158.7494*** [51.4479]	26.5814 [18.8267]	59.2141*** [18.6035]	-24.1709 [19.6859]	21.6474 [23.1478]	-9.0209 [28.2011]	-31.8791 [25.2927]
CIS	21.5947 [43.4281]	4.8086 [17.9545]	1.1096 [20.2839]	-91.0069*** [26.5153]	6.4958 [13.0469]	-64.6085*** [23.6314]	-44.5361* [24.797]
Intercept	-986.9973*** [161.6104]	-134.2265* [82.4042]	-480.3986*** [58.1071]	-589.1011*** [172.2152]	-419.5191*** [141.5391]	-477.6844*** [154.7085]	-452.4279** [233.8809]
Log(scale)	5.1248*** [0.0801]	4.5136*** [0.1134]	4.4784*** [0.0475]	4.5927*** [0.1555]	4.3868*** [0.1266]	4.3577*** [0.0731]	4.7717*** [0.2185]
Pseudo R ²	0.05633	0.02425	0.0457	0.06044	0.03467	0.07113	0.07295
Obs.	5035	5035	5035	5035	5035	5035	5035
CER							
ATE	3.7572	0.7981	4.2014	0.2987	1.0857		
Extensive margin	0.4278	0.0489	0.3337	0.0123	0.0720		
Intensive margin	3.3294	0.7492	3.8676	0.2864	1.0137		

*** = $p < 10\%$, ** = $p < 5\%$, * = $p < 1\%$. Notes. Standard errors in brackets are clustered at the country level.

For smaller firms, the calculated ATEs in Panel B of [Table 5](#) suggest that eco-friendly smaller firms finance 1.83% points more of new fixed assets with internal funds than conventional smaller firms, followed by bank loans (1.81% points), trade credit (0.71% points), and equity (0.46% points). Considering the average financing proportions for environmentally responsible smaller firms (17.8% for internal funds, 3.4% for bank loans, 1.11% for trade credit, and 0.86% for equity), CER has a substantially lower relative impact on internal funds than on any external financing source, contrary to pecking order theory. Among external financing sources, the relative impact of CER on equity is stronger than its impact on bank loans and MFI loans and weaker than its impact on trade credit. Regarding the impacts of CER on the probabilities of using financing sources, environmentally responsible smaller firms are more likely to use internal funds and banks loans (9.05% and 8.93%, respectively), followed by trade credit (2.54%) and equity (1.85%), indicating a pecking order of internal funds, debt financing, and new equity.

For larger firms and regarding fixed assets, Panel B of [Table 6](#) shows that the value of ATE of CER is 3.75 for internal funds, 4.2 for bank loans, 1.09 for trade credit, and 0.80 for equity. Taking their respective means into account (28%, 7.51%, 1.73%, and 1.33%), we find that the impact of CER on internal funds is relatively weak, suggesting the rejection of the “adverse selection.” The relative effect of CER on equity is more potent than its relative effect on bank loans and other types of external financing sources, indicating a negative association between CER and debt ratio for large firms. Thus, we confirm [Chang et al.’s \(2021\)](#) proposition that the negative impact of environmental liability on debt ratios is more pronounced for larger firms than for smaller firms. Both environmentally responsible larger and smaller firms use trade credit to finance capital expenditures, indicating high levels of trust and low information asymmetry between stakeholders along the green supply chain. Except for grants and informal financing, all other finance sources are more sensitive to CER for larger firms than for smaller firms. A comparison of the probabilities of using various financing sources indicates that environmentally responsible larger firms are more likely to use internal funds, bank loans, and equity to finance fixed investment than environmentally responsible smaller firms (42.3% versus 9%, 33.4% versus 8.9%, 4.89% versus 1.85%, respectively). For larger and smaller firms, the probabilities of using different sources of financing (rather than their proportions) for fixed investments follow a pecking order of internal funds, bank loans, and new equity.

Regarding firm-level control variables, Panel A of [Table 5](#) shows that smaller exporters are less likely to use internal funds for working capital, probably due to their access to all types of external financing sources except for informal financing. Smaller firms that perceived tax rates as moderate or severe barriers to their operations use less internal funding and more bank loans to finance working capital, in line with the expectation of POT. Panel

A of Table 6 shows that exporting has a similar impact on larger and smaller firms. However, larger firms with experienced managers more actively choose internal funds for working capital, and tax burdens do not affect the use of internal funds for larger firms.

Regarding firm-level control variables influencing capital expenditures, firms with a high growth rate are more likely to use internal funds and bank loans, regardless of firm size. Larger export firms substitute internal funds with all types of external sources to finance new fixed assets. In contrast, export-oriented smaller firms do not differ from domestic-focused smaller firms when using internal funds to purchase fixed assets. While shareholding smaller firms are less likely to use informal finance, larger firms with a fast growth rate turn to informal finance when investing in fixed assets. Tax burdens significantly affect the use of bank loans for larger firms, probably due to the tax deductibility of interest payments.

Regarding country-level control variables, Tables 5 and 6 show that, for working capital, both smaller and larger firms in countries with a fast GDP growth rate or high level of private credit use more bank loans. However, most country-level variables play differing roles in financing patterns for smaller and larger firms, indicating the necessity to estimate the models for those two types of firms separately. For example, the GDP is significantly associated with MFIs for financing working capital only for smaller firms and with trade credit and bonds only for larger firms. The level of inflation rate has a significant impact on the use of MFI loans and equity for purchasing fixed assets only for smaller firms. Given the dominant role of equity and bank loans in capital expenditures, high inflation may raise smaller firms' leverage, in line with the findings in Frank and Goyal (2009).

Robustness checks

We conduct a range of robustness checks to address concerns related to endogeneity, estimation methods, and measurement, specifically focusing on the models for smaller and larger firms. To conserve space, we refrain from reporting the results of the additional estimations, which can be provided upon request.

There is probably an endogeneity issue in our models due to some unobserved factors influencing both financing sources and CER. Accordingly, we use Rivers and Vuong's (1988) control function approach to control for endogeneity, using CO₂ emissions per capita and customer environmental concerns (a dummy variable) as instrument variables. The significant levels of CER in the models for fixed assets are not substantially different from their counterparts in the main results. For working capital, the new results do not capture any significant effect of CER for larger firms, although several coefficients of CER become significant for smaller firms.

Regarding estimation methods, an alternative modeling approach for ratio variables is a fractional logit model (Papke & Wooldridge, 1996). The estimation results of the fractional models show that, for working capital, CER significantly affects five types of financing sources, including bank loans for smaller firms. However, CER is insignificant in most of the regressions for larger firms, consistent with the main results. For fixed assets, the impacts of CER on the primary financial sources, including internal funds, equity, bank loans, and trade credit, are not affected by the alternative estimation approach.

Besides the question about whether firms have adopted any measures to enhance energy efficiency, the WBES questionnaire includes questions about whether firms have adopted 10 individual measures to reduce their environmental impacts. We further construct an indicator of environmentally responsible activities (= the number of measures adopted by a firm/the total number of measures). The estimation results using the new CER measure indicate that, for working capital, CER becomes significant in the regressions of MFI loans and government grants for smaller firms and insignificant in the regression of government grants for larger firms. However, the estimation results of CER in the models for fixed assets are similar to the main results for smaller and larger firms.

Conclusion

This study investigates the association between corporate environmental responsibility (CER) and different financing sources—namely, internal funds, equity, different types of debt, and government grants, using cross-sectional data on 15,082 private firms across 27 countries. We distinguish financing patterns for working capital and capital expenditures since they play different roles in firms' value and profitability. Specifically, we compare the impacts of CER on financing patterns for smaller and larger firms as a reflection of the importance of smaller firms in the transition to a sustainable economy.

Our empirical results indicate that CER does not significantly affect most finance sources for working capital, regardless of firm size. However, eco-friendly smaller firms are more likely to use bank loans for working capital compared to conventional smaller firms. Since the management of working capital influences firm performance in the short term (Lazaridis & Tryfonidis, 2006), this finding indicates that environmental performance may affect short-term profitability for smaller firms. Although the role of financial markets in sustainable transition is well recognized, previous studies have not distinguished the use of finance sources for working capital and fixed assets, indicating an incomplete evaluation of the potential for the short-run value generated from environmental practices. In other words, financial institutions may help firms improve the benefits of environmentally responsible activities by considering environmental factors when making lending decisions for working capital.

For capital expenditures, there is a positive and significant association between CER and the use of internal funds, equity, and different types of debt. For smaller and larger firms, CER has a lower impact on the use of internal funds than external financing sources. Among external financing, eco-friendly smaller and larger firms use more equity than bank loans and MFI loans, all relative to their respective average proportions. As such, we fail to find evidence consistent with the pecking order from internal funds, debt, to equity. Additionally, those finance sources for fixed assets are more sensitive to CER for larger firms than for smaller firms. Smaller firms need to effectively convey environmental information to stakeholders and then improve the credibility of environmental information from the investors' perspective, which consequently strengthens the relationship between CER and financing options.

For different types of debt, informal financial service providers consider only environmental factors when financing new fixed assets for smaller firms. Informal finance relies on relationships, lenders' reputations, and close monitoring to overcome information asymmetry, which is likely unrelated to larger firms. Eco-friendly smaller and larger firms use more trade credit to finance capital expenditures than their conventional counterparts. Although the documented relationship between CER and trade credit implies effective green practices along the supply chain, trade credit can be costly. Therefore, it is advisable to use trade credit to finance working capital, especially for small firms (Song et al., 2020). Using trade credit for capital expenditures reduces the availability of working capital and raises capital costs, indicating a direction for smaller firms to adjust their capital structure.

More generally, our empirical findings have potentially significant implications for optimizing capital structure, improving the benefits of environmentally responsible activities, and designing government support programs in transitioning to a sustainable economy. The different impacts of CER on financing sources indicate differences in the evaluations of environmental factors among lenders and investors, suggesting the need to adopt a more informative and transparent indicator of CER. In addition, the availability of working capital for eco-friendly smaller firms can be improved by a well-designed government grant or support program since these firms currently use government grants for financing new fixed assets rather than working capital. This also indicates that governmental initiatives aimed at achieving carbon-neutrality targets need to consider firms' capital structure and focus on maximizing short-term and long-term valuation creation by smaller eco-friendly firms.

Despite its novel contribution to SME financing literature, this study has several limitations. Our empirical analysis relies on cross-sectional data. While we use various firm-level variables to control for firm heterogeneity, future studies utilizing panel data would allow for capturing firms' specific features

and dynamic capital structure adjustments. Additionally, since environmental regulations have become increasingly stringent, there may be a time-varying impact of CER on capital structure. Panel data analysis can further investigate structural changes in the relationship between CER and financing options. Finally, this study primarily focuses on the influence of CER on financing choices between different types of debt and equity. Exploring the impacts of alternative measures of environmental performance and other aspects of sustainability on financing sources, including emerging innovative ones such as bootstrapping and crowdfunding, would provide a more comprehensive understanding of SME financing.

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No potential conflict of interest was reported by the authors.

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Ethical approval

This article does not contain any studies with human participants performed by any of the authors.

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APPENDIX

Table A1. The number of firms by country.

Country	No.	Share of smaller firms
Albania	259	58.7%
Armenia	333	75.1%
Azerbaijan	55	70.9%
Bosnia and Herzegovina	236	62.3%
Bulgaria	539	63.6%
Croatia	378	56.1%
Czech Republic	465	64.3%
Egypt	2,832	74.6%
Estonia	313	69.3%
Georgia	328	73.8%
Greece	557	64.6%
Hungary	694	68.0%
Italy	509	44.4%
Kazakhstan	755	71.0%
Latvia	276	60.5%
Lithuania	318	68.2%
Montenegro	115	64.3%
Morocco	617	60.3%
North Macedonia	233	63.9%
Poland	408	75.2%
Portugal	924	67.0%
Romania	722	65.5%
Russia	981	59.5%
Serbia	249	57.0%
Slovakia	399	69.2%
Slovenia	355	69.3%
Turkey	1,232	65.9%
Whole sample	15,082	66.6%

Table A2. Variable definitions and data sources.

Variable	Definition	Original source
Firm-level variables		
FINANCING	Proportion of finance sources used for financing working capital or the purchase of fixed assets in percentage points (see details in text)	WBES
CER	Dummy variable (= 1 for firms that adopted energy efficiency measures and 0 otherwise)	WBES
SMALLER	Dummy variable (= 1 for firms with the number of employees fewer than 50)	WBES
FIRM-GROWTH	The rate of changes in sales over the last 3 years in percentage points	WBES
EXPORTER	Dummy variable (= 1 for exporters and 0 otherwise)	WBES
FOREIGN-OWNED	Dummy variable (= 1 for firms with foreign ownership and 0 otherwise)	WBES
COOPERATION	Dummy variable (= 1 for shareholding firms and 0 otherwise)	WBES
AGE	Firm ages in years and logarithmic scale	WBES
EXPERIENCE	Managers' working experience in years and logarithmic scale	WBES
TAX	Dummy variable (= 1 for perceived tax rates as a major or very severe obstacles to their operations and 0 otherwise)	WBES
CLUSTERING	The number of firms by country and industry in logarithmic scale	WBES
COMPETITION	Dummy variable (= 1 for firms with too many competitors to count and 0 otherwise)	WBES
SMALL-CITY	Dummy variable (= 1 if firms in the locations with population fewer than 50,000 and 0 otherwise.)	WBES
MEDIUM-CITY	Dummy variable (= 1 if firms in the locations with population fewer than 50,000 and 0 otherwise.)	WBES
SERVICES	Dummy variable (= 1 for firms in the service industry and 0 otherwise.)	WBES
Country-level variables		
GDP	Real gross domestic product (GDP) per capita in US dollars	World Bank
GDP-GROWTH	Growth of GDP in US dollars	World Bank
PRIVATE-CREDIT	The share of private credit divided by GDP	World Bank
INFLATION	The rate of changes in the consumer price index in percentage points	World Bank
PROPERTY-RIGHTS	Protection of property rights index	Property Rights Alliance

Source: Property Rights Alliance: <https://www.internationalpropertyrightsindex.org/countries>.