

Original Research

How Can Entrepreneurs' Social Organization Identity Affect the Environmental Investment?

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Abstract

Political connections and corporation social responsibility (CSR) play important roles in firms' investment decisions. This paper examines empirically how distinct social organization identities of the entrepreneurs affect their environmental investment using Chinese private enterprises from the 13th national private enterprise sampling survey in 2018. The results show that: (1) The social organization identities of private entrepreneurs has a significant positive effect on firms' environmental investment; (2) The positive effects decrease in sequence for government-pushed organizations, industry associations and fellowship organizations; (3) There are significant heterogeneities among regions, industries, external risks and internal ownership structures; and (4) Environmental investment has a significant positive effect on firms' economic performance. After the methods of variable substitution, instrumental variable, PSM, etc., the results are all robust, which ensures the reliability of our findings. Finally, the research proposes policies of voluntary environmental management for Chinese private enterprises with different social organization identities.

Keywords: corporate social responsibility, private enterprises, social organization identity, environmental investment, Hawthorne effect

Introduction

According to the 2020 Environmental Performance Index (EPI), China ranks 120th out of 180 countries and regions with a score of 37.3, which indicates that environmental pollution is still an important factor that constrains the sustainable development in China. In recent years, the Chinese government has paid much attention to environmental protection and issued different policies to encourage enterprises to carry out green

practices and improve environmental performance by strengthening energy conservation, emission reduction and green technology innovation, etc. However, the reality is far from satisfactory. The environmental governance of Chinese listed companies remains at a low level (Li et al., 2019) [1], green investment is still insufficient (Tang et al., 2013) [2], and pollution problems also occur from time to time. In October 2020, the fifth Plenary Session of the 19th Central Committee of the Communist Party of China proposed to encourage green development, build an ecological civilization system, promote the harmonious coexistence of man and nature, adhere to the concept that clear waters and green mountains are as good as mountains

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of gold and silver, and focus on the environmental issues of enterprises in sustainable development. Enterprises are not only the main body of pollutant emissions but also the key link in environmental governance, so their active participation in environmental governance is very critical. The number of social organizations in China has been steadily rising since the reform and opening-up. Due to their lack of personal power, more and more private entrepreneurs are forming social connections and joining organizations to further their objectives. Whether private entrepreneurs may use their social organizational identity to impact environmental investment? This is a query that can be researched.

The remainder of this paper is organized as follows: the second part reviews pertinent literature; the third part discusses related theories and hypotheses; the fourth part provides the methodology and data; the fifth part presents and discusses the empirical results in detail; and the final part summarizes the conclusion and proposes policy implications.

Literature Review

Factors Affecting Environmental Investment

Extensive studies have been carried out on corporate environmental investment. Corporate environmental behavior, as described by Corbett (2002), is the effort made by enterprises to reduce their negative impact on the environment during the course of production and operation [3]. Some scholars discuss the influencing factors of enterprise environmental investment. According to Aragón-Correa and Sharma (2003), managers' cognition affects the corporate environmental strategy, and their knowledge of the internal organizational structure and external competitive environment has a significant impact on enterprise environmental investment [4]. Other influencing factors can be summarized as environmental regulation, supervision by public opinion, government fiscal and tax policies, characteristics of business executives, etc.. Relevant researches indicate that different types of environmental regulations have different impacts on environmental investment. Overall, there is a U-shaped relationship between the intensity of government environmental regulations and corporate environmental investment (Zhang and Gao, 2022; Shen and Zhou, 2020; Li et al., 2018; Xie et al., 2018; Li and Tian, 2016) [5-9]. From another perspective, both supervision by public opinion and government incentive mechanisms such as tax reduction can promote an increase in corporate environmental investment. Media attention can create market pressure, thereby promoting corporate environmental investment (Wang et al., 2017; Chen and Zhong, 2022; Xie and Wang, 2021) [10-12]. In addition, the ability of business executives has a positive impact on the level of corporate environmental responsibility

(Zhang et al., 2019; Li et al., 2017; Li and Zhang, 2016) [13-15].

Environmental Investment & Enterprises

The influence of environmental investments on the growth of enterprises has been studied by many academics. Researches from Hamilton and Zilberman show that environmental investment is beneficial to the long-term and stable development of enterprises, which can build a positive image of firms and increase the confidence of the public and potential investors [16]. Haveman et al. argued that environmental investment can help obtain heterogeneous resources and enhance competitive advantages [17-18]. Many studies have found that environmental investment can improve the enterprise performance (Chen, 2019; Lee et al., 2015; Lundgren and Zhou, 2017; Garcés-Ayerbe and Cañón-de-Francia, 2017) [19-22]. Furthermore, Wang and Wang have demonstrated that environmental investment will be able to promote the application and popularization of energy-saving and environmental protection technologies [23].

China's private enterprises account for more than 90% of the total number of enterprises, playing an important role in the innovation of environmental protection technology and the upgrading of industry. However, since the environmental protection is a time-consuming and cost-increasing process, there is a lack of proactiveness for private enterprises to invest in environment (Clarkson et al., 2004) [24]. Therefore, how to guide and encourage private enterprises to invest in environmental is the key to environmental governance in China. At present, the shareholding structure of most private enterprises in China presents the characteristics of highly concentrated ownership. The main decision-maker of environmental investment of private enterprises is still the major shareholder. Therefore, the internal incentive mechanism for entrepreneurs to make environmental investment is of special importance.

Social Organizations and Entrepreneurs

Since the reform and opening-up, the number of social organizations in China has been increasing under the "dual power of politics and market" (Ma and Jia, 2015; Xie and Ma, 2015) [25-26]. It has been called "corporate revolution in China" (Wang and He, 2004) [27]. The development of social organizations is of great significance to entrepreneurs, domestic and foreign scholars have conducted relevant research. Due to the weak individual power of private enterprises, entrepreneurs join various social organizations to express their claims of interest through organizations and reduce the risks of environmental uncertainties and stabilize development expectations (Huang, 2015) [28]. Social organizations also provide "membership services" to meet the interests of enterprises and support them to improve their anti-risk ability (Schmitter and Streeck,

1999) [29]. At the same time, China's traditional culture also determines that social organizations still maintain close relations with the government, and tend to seek informal "Guanxi" with officials to achieve their goals (Bruun, 1993) [30]. More and more private entrepreneurs lay stress on participating in different types of social organizations to maintain the social relations (Cai et al., 2017) [31]. Then, is it possible for the improvement of environmental investment be motivated by social organization identities of private entrepreneurs, rather than relying solely on the government's mandatory environmental regulation?

This paper attempts to answer the above question using Chinese private enterprises sampling survey data and unravel the relations between social organization identities of private entrepreneurs and the environment investment of their firms. The possible contributions lie in three aspects. First, the research groups the social organizations into three types to study the differences in their impact on the environmental investment of the enterprises, which expands the scope of self-incentive measures to promote environmental protection from the perspective of the behavior of entrepreneurs. Second, heterogeneity analysis is carried out by industry, region, external risk environment and internal shareholding structure, so as to provide a feasible breakthrough path for China's current environmental dilemma. Third, most of the literature on the enterprises' environmental investment is based on samples of listed public companies, while the research adopts a new micro-level sampling survey data of private enterprises to verify the positive effect effects of entrepreneurs' social organization identities on environmental investment in China, and robust results are obtained using PSM method and IV-Tobit test to control possible endogeneity of the model.

Theories and Hypotheses

Stakeholder Theory

The stakeholder theory points out that enterprises do not exist independently. In addition to the market, enterprises are also affected by social, legal, political and other factors. Therefore, the decision-making behavior of firms is restricted by many aspects, and it is difficult to completely separate organizational development from external factors (Jones, 1995) [32]. The traditional view of "shareholder supremacy" has been challenged. According to the stakeholder theory, the purpose of enterprise operation and production is not limited to serving shareholders, but also needs to consider stakeholders related to enterprise development, such as employees, creditors, consumers, etc. Therefore, enterprises should take the maximization of overall interests as the business goal, and balance and take into account the interests of stakeholders, which means, enterprises should take corporate social responsibility

(CSR) (Jia et al., 2016; Feng et al., 2016; Wang and Xu, 2016) [33-35]. Environmental protection is an important part of CSR. On the one hand, the negative externality of environment pollution should be borne by the enterprises, and on the other hand, the environmental investment is the actual cost of the enterprises. The cost in environment cannot bring economic benefits to enterprises in a short period of time but can cause an extrusion effect to productive investment. Enterprises that pursue profit maximization seldom take the initiative to undertake the social responsibility of environmental protection, which requires the government to adopt regulatory means to promote enterprises to make environmental investment decisions.

Public Governance Theory

Public governance theory emphasizes that multi-power of governance should replace the governance with the government as a single actor. Therefore, the public and social organizations, as one of the multiple powers, can also play an important role in environmental governance. In China, the government plays a "bellwether" in environmental protection and plays an extremely important role, which effectively alleviates environmental pollution to a certain extent. However, it is difficult to solve the environmental pollution problem fundamentally by relying on the government's governance alone, as government supervision mechanism is not perfect and local governments are likely to pursue their own interests and weaken the implementation of environmental policies, resulting in poor environmental performance. As the public gradually realizes the importance of protecting the ecological environment, a large number of organizations emerge in the society. Social organizations with specific expertise and scale advantages can make up for the "failure" of the government and market in environmental governance. Therefore, entrepreneurs working in social organizations can not only improve their awareness of environmental responsibility and better participate in environmental governance, but also join various social organizations and express their claims of interests.

Transformation of Environmental Governance Paradigm

Since Pigou (1920) proposes corrective taxes to reduce negative externalities, punitive measures have become an important tool for environmental governance [36]. However, due to the lack of flexibility for enterprises, the punitive regulatory mechanism often fails to achieve environmental protection goals, and tends to cause distortion effect of resource allocation, resulting in high costs (Hahn and Stavins, 1992) [37]. Some studies have verified that incentive measures have better effects than punitive measures (Bergquist et al., 2013; Xie and Zou, 2021; Shang et al., 2021) [38-40]. For China, punitive measures based on laws and regulations have played

an important role in environmental protection in a certain stage, but in the implementation process, it is easy to cause “indiscriminate” phenomenon such as “one size fits all”, resulting in high costs. Therefore, as China is facing crucial difficulties in environmental protection at current stage, more incentive measures should be introduced and the governance paradigm should be transferred to the combination of punitive tools and incentive measures.

Entrepreneurs' Social Organization Identities and Environmental Investment

In China, social organizations can achieve friendly policies and development environment for the whole industry by strengthening the links between enterprises and the government and other organizations. Compared with individual enterprises, social organizations have greater social influence and receive more social attention, including the government and the public, which will inevitably affect the behaviors of their members. Although the fulfillment of CSR is a corporate behavior, the decisions are made by entrepreneurs or managers, especially in China, private enterprises are mainly family-owned enterprises, and entrepreneurs themselves play a key role in major decision-making and daily management of the companies. So social organization identities will bring more attention to the entrepreneurs. The Hawthorne Effect is the idea that people change their behavior when they know they are being observed. At present, China's economy has shifted from a stage of high-speed growth to a stage of high-quality development. Both the Chinese government and the public will pay high attention to the green behavior of enterprises and then make certain reactions.

Private entrepreneurs with a certain social organization identity will attract more social attention than those without. Both positive image and negative image will have a magnifying effect. Therefore, in this case, entrepreneurs will feel that they have become the object of public observation, pay great attention to their social image, strive to regulate their own behavior, and actively practice the concept of green development in major decisions and daily management. For example, the media's attention and report on the companies' negative environmental behavior will affect the reputation of entrepreneurs, and then affect their behavior, and ultimately promote the company to improve its environmental performance. The benefits of this voluntary behavior tendency are as follows: on the one hand, enterprises can avoid punitive environmental regulations and get rewards from various incentive measures, and further strengthen the relationship between government and business; on the other hand, due to the good social image of enterprises, the products or services they provide will be more recognized by the society, laying a solid public opinion foundation for enterprises to win advantages in the market competition.

Therefore, the research proposes the following:

Hypothesis 1(H1): Entrepreneurs with social organization identities will be more active in environmental investment.

The social organizations that private firms belong to in China are mainly divided into three categories: government-pushed organizations, industry associations and fellowship organizations. Government-pushed organizations are social organizations with Chinese characteristics, which are mainly promoted and established by government administrative forces and strongly guided by the government in their operation. At present, there are two types of government-pushed social organizations in China. One is the Federation of Industry and Commerce or the (General) Chamber of Commerce with regional names, at the national level it is called the All-China Federation of Industry and Commerce or the Chinese Non-Governmental Chamber of Commerce, and at the local level, it is called regional Federation of Industry and Commerce or (General) Chamber of Commerce, such as the Jiangsu Federation of Industry and Commerce (Jiangsu General Chamber of Commerce), the Suzhou Federation of Industry and Commerce (Suzhou General Chamber of Commerce), etc. The Federation of Industry and Commerce or the (General) Chamber of Commerce is the bridge between entrepreneurs and governments at all levels. The other type is the individual and private economic associations, which are established by the market supervision and management departments of governments at all levels, and are non-profit social groups voluntarily formed by individual industrial and commercial households, private enterprises and other organizations and individuals, whose main duty is to actively perform the basic functions of unity, education, and guidance, strive to give play to the role of mass autonomy, bridges, regulatory assistants, and intermediary organizations, and actively act in publicizing and educating, guiding development, coordinating services, standardizing self-discipline, and making positive contributions to promoting the healthy development of the individual and private economy. Because of the close connection between this type of social organizations and the government, compared with ordinary social organizations, their attention from society is also wider, and the performance of enterprises in environmental protection behavior will quickly spread in society and show an amplification effect, and the positive effect will strengthen the social responsibility image of enterprises, and the negative effect will make the social image of enterprises decline rapidly or even lead to bankruptcy. Therefore, entrepreneurs with this type of social organization identity will be more careful to regulate the behavior of their own enterprises.

Industry associations are so far the mainstream social organizations in the world, but less developed in China. There are both national and regional industry associations, and firms can choose to join different associations according to their own needs. Currently,

there are two types of industry organizations in China, one is formed after the separation of administrative functions in the original industry association during the process of market-oriented reform, and the other type is the industry association that enterprises spontaneously establish in the course of development. Entrepreneurs with the identity of industry associations will receive double attention from industry organizations and society, which will make entrepreneurs consciously fulfill the environmental protection behavior of their own enterprises. From the perspective of industry concern, because most of the industry associations are self-organized by enterprises, they give enterprises more services than constraints, and the biggest punishment for enterprises is to dismiss their membership. And spontaneously formed industry organizations still lack bottom-up participation and representation, and face the problem of continuous loss of members. Many industry associations are not attractive enough to member companies due to their weak service capabilities, and the social status of the industry is not high, which leads to member companies not feeling a lot of social pressure from society and the industry, so the punishment of self-discipline will not have a great impact on the enterprise itself. Similarly, because of the non-governmental nature of industry organizations and the large overall number, the social attention received by enterprises is relatively scattered, so compared with government social organizations, their self-restraint behavior will be relatively weak.

Another important type of social organizations for Chinese private enterprises to participate in is fellowship organizations. This kind of social organization is mainly based on interests and hobbies and some common experiences, such as MBA alumni association, young entrepreneurs' association, interest and hobby organizations, etc. Especially the rise of the young generation of entrepreneurs, they pay more attention to flying their ideals, and are more interested in joining such social organizations, and often carry out various colorful membership activities. However, the structure of this kind of social organization is relatively loose, and there is generally no very binding constitution of members. The function is also relatively simple, generally not oriented to serve enterprise development, but to maintain friendship. Their social awareness rate is not high, a lot of fellowship organizations are never announced to the public, and the activities carried out are relatively private, so they will not receive widespread attention from the society. Entrepreneurs with this identity will not be paid attention to by society, and will not be subject to environmental investment pressure from society, and their self-behavior tendencies will be less affected.

Based on the above reasoning, the research proposes the following hypothesis:

Hypothesis 2(H2): The influence of government-pushed social organizations, industrial associations and fellowship organizations on enterprise environmental investment decreases successively.

Methodology and Data

Sample Selection and Data Sources

The data in this paper comes from the 13th national private enterprise sampling survey in 2018, which is made by a research group composed of 5 departments such as the National Federation of Industry and Commerce and the China Private Economy Research Association, relying on the strength of the corresponding departments in various provinces (autonomous regions and municipalities). This data is currently the latest version of continuous official authoritative survey data for private enterprises at the national level, covering all provincial-level administrative units in Chinese mainland and 15 major industries of the national economy. The research excludes samples of missing important variables in the empirical evidence.

Methodology

Through the Hausman test, this paper uses fixed effect model instead of random effect model. The model controls for Industry Fixed Effect and Provincial Fixed Effect. Industry Fixed Effect is to control the influence of unobservable factors at the industry level that do not change over time on enterprise environmental investment, and Provincial Fixed Effect is designed to eliminate other uncertainties that may affect results by studying data from different provinces. In order to investigate the effects of various types of social organization identities on corporate environmental investment, this paper divides social organizations into three categories: Government-pushed organization identity, Industry association identity and Fellowship organization identity. Each category of identity is used separately as an independent variable in regression analysis along with Total Social Organization identity. Although the fixed effect model controls some variables that affect the environmental investment of enterprises, it cannot completely eliminate the endogenous problem existing in the missing variables. Therefore, we use the IV-Tobit test and PSM method to control the endogeneity in the robustness test. Additionally, this paper also conducts heterogeneity test to verify whether the research results are consistent in different situations.

Model

So as to verify the influence of entrepreneurs' social organization identity on enterprise environmental investment, the research builds the empirical model as follows:

$$EPI = \beta_0 + \beta_1 SG + \beta_2 Control + \sum Province + \sum Industry + \varepsilon \quad (1)$$

Dependent Variables

The dependent variable is enterprise environmental investment and the research uses three indicators for its measurement. The core indicator is the intensity of environmental investments, which is the ratio of the amount of investment used by the enterprise for environmental protection to the net assets in the current year [41]. At the same time, the research also uses two other types of environmental investment variables as a robustness test. One is the scale of environmental investment, which is the log of the amount of environmental investment used by the enterprise in the current year; and the other is propensity to invest in environment, which is set to 1 when the amount of environmental investment in the current year is greater than 0, otherwise set to 0 [42].

Independent Variables

The core independent variables in this paper are the total social organization identity of entrepreneurs. For the three categories of organizations mentioned above, the indicators are computed as follows: (1) Government-pushed organization identity is the number of types of government-pushed social organizations that entrepreneurs have joined; (2) Industry association identity is the number of types of industry associations that entrepreneurs have joined;

(3) Fellowship organization identity is the number of types of fellowship organizations that entrepreneurs have joined. (4) Social organization identity is obtained by adding the above three categories of social organization assignments.

Control Variables

Considering that other personal characteristics and corporate characteristics of entrepreneurs will also affect corporate social responsibility, the research controls these characteristics. At the enterprise level, the research controls the size, age, asset-liability ratio and listing situation of enterprises. In terms of entrepreneur characteristics, gender, age and education level are controlled. The research also controls for province and industry variables. Table 1 lists the variable names and variable definitions of the main variables.

Descriptive Statistics

To control the effect of extreme values in the sample data, contingencies with extreme values are downsized by 1% up and down, while missing variables are automatically rejected during regression. The descriptive statistical results of the main variables are shown in Table 2. As far as the excluded sample enterprises are concerned, 32.7% of the enterprises have environmental investment behaviors, and each enterprise has joined

Table 1. Variable description.

Name	Denotation	Definition
Intensity of environmental investment	EPI_I	Amount of environmental investment/ net assets
Scale of environmental investment	EPI_S	Log of the amount of environmental investment
Propensity to invest in environment	EPI_P	1 when the amount of environmental investment is greater than 0, otherwise 0
Total Social Organization identity	SG_A	Sum of all types of social organizations joined
Government-pushed organization identity	SG_G	Number of government-pushed organizations joined
Industry association identity	SG_I	Number of industry associations joined
Fellowship organization identity	SG_F	Number of fellowship organizations joined
Size of enterprise	Size	Log of net asset
Age of enterprise	Age_F	The year of the survey/the year of establishment of corporation
Asset-liability ratio of enterprise	Lev	Liability/asset
Listed or not	Stock	1 when listed or to be listed, otherwise 0
Gender of the entrepreneur	Man	1 for male and 0 for female
Age of the entrepreneur	Age_E	The year of the survey - the year the entrepreneur was born
Education of the entrepreneur	Edu	1 for under middle school, 2 for high school, 3 for junior college, 4 for undergraduate, 5 for master, 6 for PHD
Province	Pro	Dummy of province, totally 32 provinces
Industry	Ind	Dummy of industry, totally 15 industries

Table 2. Descriptive statistics of variables.

Variables	Obs.	Mean	S.E.	Min	Max
EPI_I	3700	0.0180	0.0795	0.0000	0.6670
EPI_S	3700	1.0820	1.8440	0.0000	7.1490
EPI_P	3700	0.3270	0.4690	0.0000	1.0000
SG_A	3700	1.7560	1.4040	0.0000	7.0000
SG_G	3700	0.8380	0.7090	0.0000	2.0000
SG_I	3700	0.6100	0.7050	0.0000	2.0000
SG_F	3700	0.3080	0.5750	0.0000	3.0000
Size	3700	15.5300	2.5850	8.5170	21.6600
Age_F	3672	11.1200	7.0690	0.0000	65.0000
Lev	3289	0.2710	0.2920	0.0000	1.1900
Stock	3391	0.1150	0.3190	0.0000	1.0000
Man	3688	0.7980	0.4020	0.0000	1.0000
Age_E	3677	45.9900	9.7860	18.0000	78.0000
Edu	3658	3.0950	1.1230	1.0000	6.0000

more than 1.76 types of social organizations on average; the average asset-liability ratio is 27.1%, more than 11% of the enterprises have been listed or to be listed, and the average number of years of establishment is more than 11 years; the proportion of men among entrepreneurs is nearly 80%, the average age is close to 46 years old, and the average education is above college level.

Table 3 lists the correlation information for the variables. The data show that the correlation coefficients of social organizations (SG_A), industry associations (SG_I), fellowship organizations (SG_F), government-pushed organizations (SG_G) and the environmental protection investment scale (EPI_S) are 0.277, 0.258, 0.029, 0.268, respectively. Except for the fellowship organizations that are slightly lower in the level of 10%, and the others are significant at the level of 1%, indicating that the social organization identity of private entrepreneurs helps to improve the environmental social responsibility of enterprises, which simply verifies the hypothesis 1.

In order to further test whether there is multicollinearity, this research conducts the variance expansion factor VIF test. As Total Social Organization identity is the sum of assigned values for three types of social organizations, Table 4 only shows the VIF test results when it is used as the explanatory variable. The VIF of all variables is less than 5, regardless of which of the four independent variables is chosen. Therefore, there is no multicollinearity problem.

Results and Discussion

The majority of studies on corporate environmental investment come from the viewpoint of harsh

environmental protection rules, while very few studies focus on entrepreneur behaviors, particularly from the perspective of social organization identity. In order to provide countermeasures for promoting environmental investment in China, this paper divides social organizations into three categories and performs heterogeneity analysis in accordance with industry, region, external risk environment, and internal shareholding structure.

Basic Regression Results

Before regression, z-core standardized processing was carried out for significant social risks in order to facilitate comparison of data effects. After processing, the significance of regression does not change, and the coefficient size can be compared. Tobit method is used to test since some enterprises do not invest in environmental protection.

Table 5 reports the Tobit regression results of entrepreneurs' social organization identity and enterprise environmental investment intensity, and the results of column (1) show that the total social organization identity and environmental investment intensity of entrepreneurs are significant at the level of 1%, indicating that the impact of entrepreneurs joining a variety of social organizations on the intensity of enterprise environmental investment is positive and significant, and hypothesis 1 has been tested. The results in Columns (2) and (3) show that when entrepreneurs join government-pushed organizations and industry associations, the coefficient of investment intensity of enterprise environmental protection is significant at 1% level. By comparing the coefficient size, the effect of government-pushed organizations is significantly

Table 3. Correlation coefficient matrix.

Variable	EPI_S	EPI_I	EPI_P	SG_A	SG_I	SG_F	SG_G	Size	Age_F	Lev	Stock	Man	Age_E
EPI_I	0.395***	1.000											
EPI_P	0.841***	0.325***	1.000										
SG_A	0.277***	0.033**	0.266***	1.000									
SG_I	0.258***	0.030*	0.237***	0.783***	1.000								
SG_F	0.029*	-0.015	0.035**	0.551***	0.177***	1.000							
SG_G	0.268***	0.047***	0.262***	0.755***	0.413***	0.105***	1.000						
Size	0.469***	0.077***	0.399***	0.458***	0.428***	0.116***	0.389***	1.000					
Age_F	0.263***	0.037**	0.241***	0.266***	0.260***	0.004	0.266***	0.404***	1.000				
Lev	0.231***	0.058***	0.207***	0.201***	0.191***	0.042**	0.172***	0.306***	0.205***	1.000			
Stock	0.265***	0.035**	0.192***	0.256***	0.230***	0.139***	0.162***	0.350***	0.138***	0.132***	1.000		
Man	0.149***	0.056***	0.125***	0.122***	0.105***	0.007	0.131***	0.170***	0.074***	0.039**	0.065***	1.000	
Age_E	0.133***	0.021	0.130***	0.073***	0.133***	0.168***	0.148***	0.195***	0.340***	0.119***	0.063***	0.127***	1.000
Edu	0.129***	-0.017	0.069***	0.285***	0.238***	0.239***	0.132***	0.336***	0.106***	0.153***	0.233***	0.009	0.211***

Table 4. Results of VIF test.

Variable	VIF	1/VIF
SG_A	1.46	0.685968
Size	1.93	0.517349
Age_F	1.40	0.714713
Lev	1.21	0.827855
Stock	1.21	0.827855
Man	1.08	0.925199
Age_E	1.30	0.767708
Edu	1.48	0.675050
Mean VIF	1.38	

greater than that of industry associations. Column (4) shows that the effect of fellowship organizations on the intensity of environmental protection investment is not statistically significant. Put them together, hypothesis 2 has been verified.

Further analysis of control variables shows that from the perspective of enterprise variables, the establishment time of the enterprise, the asset-liability ratio and the status of listed or to be listed are all positively correlated to the intensity of environmental investment, and are all statistically significant. From the perspective of entrepreneur variables, the scale of investment in environmental protection is larger when the entrepreneurs are male. There is no significant relationship between enterprise size, age and education level of entrepreneurs and environmental investment intensity.

Robustness Test

In this section the research uses relevant variable substitution, instrumental variable method, PSM and other methods to conduct robustness test.

Substitute the Dependent Variable

Firstly, the intensity of environmental investment is replaced by the scale of environmental investment and propensity to invest in environmental protection. Table 6 reports the regression results of the entrepreneurs' social organization identity and enterprise environmental investment scale. Column (1) shows that the total social organization identity and environmental investment scale are significant at the level of 1%, indicating that the impact of entrepreneurs joining social organizations on the scale of enterprise environmental protection investment is positive and significant, and hypothesis 1 is tested. The results of columns (2)-(4) show that although the coefficients of different types of social organization identities of entrepreneurs on the scale of enterprise environmental investment are all positive, the impact of

fellowship organizations is not statistically significant, while the coefficients of the identity of government-pushed organizations and the identity of industry associations are statistically significant at 1% level, showing the difference in the role of different social organizations. From the comparison of coefficients, the effect of government-pushed organization identity is higher than that of industry association identity. Hypothesis 2 is tested.

Table 7 reports the Probit regression results of entrepreneurs' social organization identity and enterprises' propensity to invest in environmental protection. Column (1) show that entrepreneurs total social organization identity and enterprises' propensity to invest in environmental protection are significant at the level of 1%, indicating that entrepreneurs' joining social organizations has a positive and significant impact on enterprises' propensity to invest in environmental protection. Columns (2) and (3) also show that when entrepreneurs join government-pushed social organizations and industry associations, the coefficients of their enterprises' propensity to invest in environmental protection are both significant at the level of 1%, but show different degrees of effects. As shown in column 4, fellowship organizations have no significant impact on enterprises' propensity to invest in environmental protection. These empirical results are consistent with the previous ones, and hypothesis 2 is further tested.

Instrumental Variable Method

Considering that the entrepreneur's social organization identity can improve enterprise environmental investment, it cannot be ruled out that enterprises will have more social organization identity by participating in environmental protection behaviors. Although a series of variables affecting corporate environmental investment have been controlled, it cannot completely eliminate the impact of variable omission on research and the existing endogenous problems. To this end, multiple instrumental variables for the identity of entrepreneurs' social organizations are designed. One is the trend level, due to the irreversibility of time, the average regional-industry risk of the survey data in 2016 and 2018 is calculated, and the latter is subtracted from the former, which is the trend variable of the entrepreneur's social organization identity. The second is the relative level which is measured by subtracting the average level of the corresponding region-industry from the corresponding individual index of the enterprise. Instrument variables are standardized before regression.

Table 8 uses the IV-Tobit method to test the intensity of environmental protection investment, the results show that the coefficients of the total social organization identity and the classified social organization identity of the entrepreneur are positive, except for the fellowship organization, the coefficients of other

Table 5. Regression Results of Social Organization Identity and Environmental Investment Intensity (EPI_I).

	(1)	(2)	(3)	(4)
SG_A	0.0207***			
	(4.9890)			
SG_G		0.0208***		
		(5.1992)		
SG_I			0.0164***	
			(4.1794)	
SG_F				0.0002
				(0.0638)
Size	-0.0015	-0.0013	-0.0012	0.0005
	(-0.7805)	(-0.6714)	(-0.6363)	(0.2850)
Age_F	0.0016***	0.0016***	0.0017***	0.0019***
	(2.8274)	(2.8221)	(3.0436)	(3.3923)
Lev	0.0471***	0.0479***	0.0484***	0.0504***
	(3.4799)	(3.5474)	(3.5788)	(3.7273)
Stock	0.0201*	0.0236**	0.0221**	0.0254**
	(1.8882)	(2.2215)	(2.0772)	(2.3719)
Man	0.0265***	0.0246**	0.0271***	0.0282***
	(2.6021)	(2.4191)	(2.6669)	(2.7654)
Age_E	0.0004	0.0003	0.0003	0.0004
	(1.0096)	(0.6406)	(0.6453)	(0.9210)
Edu	-0.0038	-0.0016	-0.0033	-0.0019
	(-1.0225)	(-0.4254)	(-0.8935)	(-0.5167)
Cons	-0.1130***	-0.1159***	-0.1103***	-0.1466***
	(-2.7899)	(-2.8774)	(-2.7005)	(-3.6391)
N	2964	2964	2964	2964
Pse-R ²	0.7041	0.7064	0.6962	0.6779
Chi ²	669.3197	671.5671	661.8974	644.4322
Industry FE	YES	YES	YES	YES
Province FE	YES	YES	YES	YES

Note: *Statistically significant at the 10% level; **Statistically significant at the 5% level; ***Statistically significant at the 1% level; *t* statistics in parentheses.

variables are statistically significance at the level of 1%. The government-pushed social organizations have the greatest effect, which is also in line with hypothesis 1 and hypothesis 2, showing the robustness of the results.

Table 9 is the impact on the scale of environmental investment. From the perspective of coefficient significance, in addition to the fellowship organizations, whether the total social organization identity of entrepreneurs, or the identities of government-pushed social organization or industry association,

the coefficient is significantly positive, and the effect of identity of government-pushed organizations is the largest, in line with hypothesis 1 and hypothesis 2, showing the robustness of the results.

Table 10 uses the IV-Probit method to test the propensity of environmental protection investment, and the results show that the coefficients of entrepreneurs' total social organization identity, government-pushed organization identity and industry association identity are significantly positive, and the role of government-pushed social organizations is the largest, which is also

Table 6. Regression Results of Social Organization Identity and environmental Investment Scale (EPI_S).

	(1)	(2)	(3)	(4)
SG_A	0.4262***			
	(5.0530)			
SG_G		0.4260***		
		(5.2021)		
SG_I			0.3464***	
			(4.3531)	
SG_F				0.0035
				(0.0463)
Size	0.5709***	0.5759***	0.5741***	0.6105***
	(13.8676)	(14.0715)	(13.9177)	(14.9964)
Age_F	0.0273**	0.0273**	0.0295***	0.0337***
	(2.4084)	(2.4114)	(2.6087)	(2.9740)
Lev	0.9685***	0.9825***	0.9938***	1.0365***
	(3.4767)	(3.5339)	(3.5705)	(3.7163)
Stock	0.3645*	0.4350**	0.4064*	0.4769**
	(1.6875)	(2.0246)	(1.8857)	(2.1973)
Man	0.4658**	0.4315**	0.4797**	0.5026**
	(2.2193)	(2.0586)	(2.2886)	(2.3905)
Age_E	0.0033	0.0000	0.0001	0.0028
	(0.3828)	(0.0048)	(0.0109)	(0.3186)
Edu	-0.1416*	-0.0942	-0.1311*	-0.0997
	(-1.8492)	(-1.2386)	(-1.7158)	(-1.2943)
Cons	-10.7766***	-10.8475***	-10.6821***	-11.4560***
	(-12.6719)	(-12.8159)	(-12.4621)	(-13.5123)
Observations	2964	2964	2964	2964
Pse-R ²	0.1797	0.1799	0.1789	0.1765
Chi ²	1435.9390	1437.5437	1429.3226	1410.3617
Industry FE	YES	YES	YES	YES
Province FE	YES	YES	YES	YES

Note: *Statistically significant at the 10% level; **Statistically significant at the 5% level; ***Statistically significant at the 1% level; *t* statistics in parentheses.

in line with hypothesis 1 and hypothesis 2, showing the robustness of the results.

PSM Method

To solve the problem of sample selection bias, the propensity score matching (PSM) method is introduced. Firstly, all the enterprise samples are divided into high and low groups according to whether the mean value of entrepreneurs' social organization identity is greater than or equal to the mean value of corresponding

variables in the province and industry where the enterprise is located. On this basis, the control variables mentioned above are used as covariable for 1:4 linear matching, and the balance test results show that the selection of matching variables meet the prerequisite requirements of PSM. The average treatment effect ATT is reported in Table 11. From the value of total social organization identity, government-pushed organizations and industry associations, the average treatment effect is positive, and all of them are statistically significant test. For fellowship organizations, most of the average

Table 7. Regression Results of Social Organization Identity and environmental Investment Propensity (EPI_P).

	(1)	(2)	(3)	(4)
SG_A	0.2686***			
	(4.7730)			
SG_G		0.2594***		
		(4.7493)		
SG_I			0.2064***	
			(3.8432)	
SG_F				0.0322
				(0.6461)
Size	0.2750***	0.2799***	0.2797***	0.3007***
	(9.9448)	(10.1860)	(10.1191)	(11.0944)
Age_F	0.0182**	0.0181**	0.0197**	0.0222***
	(2.2839)	(2.2699)	(2.4798)	(2.8136)
Lev	0.4256**	0.4341**	0.4417**	0.4721***
	(2.3307)	(2.3820)	(2.4235)	(2.6045)
Stock	0.1225	0.1708	0.1548	0.1940
	(0.7902)	(1.1048)	(1.0015)	(1.2500)
Man	0.1205	0.1088	0.1270	0.1414
	(0.8827)	(0.7982)	(0.9336)	(1.0427)
Age_E	0.0025	0.0007	0.0009	0.0028
	(0.4323)	(0.1120)	(0.1473)	(0.4841)
Edu	-0.1320**	-0.1009*	-0.1222**	-0.1070**
	(-2.5441)	(-1.9579)	(-2.3680)	(-2.0664)
Cons	-5.3532***	-5.4435***	-5.3539***	-5.8164***
	(-9.5430)	(-9.7763)	(-9.4799)	(-10.5319)
Observations	2928	2928	2928	2928
Pse-R ²	0.3050	0.3050	0.3029	0.2991
Log lik.	-1308.7362	-1308.8640	-1312.8005	-1319.9802
Industry FE	YES	YES	YES	YES
Province FE	YES	YES	YES	YES

Note: *Statistically significant at the 10% level; **Statistically significant at the 5% level; ***Statistically significant at the 1% level; *t* statistics in parentheses.

processing effects are not statistically significant, and the direction of the coefficients is not robust. For coefficient size and significance, the role of government-pushed social organizations is stronger than that of industry associations. These are basically consistent with the previous empirical results.

Regressions are further performed with the matched data to verify the robustness of the results. With the matched data regression, the effects of identities of total social organizations, government-pushed organizations, industry associations on the environmental investment

are all positive, and statistically significant at 1% level, while the coefficient of fellowship organizations is not significant. These are in exact accordance with the empirical results before matching, showing the strong robustness of the results.

Heterogeneity Test

The impact of the social organization identities on the environmental investment may be heterogeneous due to different regions, industries, external risks and

Table 8. Instrumental Variable Method EPI_I (IV-Tobit).

	(1)	(2)	(3)	(4)
SG_A	0.0199***			
	(4.6261)			
SG_G		0.0200***		
		(4.8404)		
SG_I			0.0156***	
			(3.8542)	
SG_F				0.0003
				(0.0846)
Size	-0.0014	-0.0012	-0.0011	0.0006
	(-0.7241)	(-0.6067)	(-0.5784)	(0.2885)
Age_F	0.0016***	0.0016***	0.0017***	0.0019***
	(2.8747)	(2.8843)	(3.0929)	(3.4083)
Lev	0.0477***	0.0484***	0.0490***	0.0510***
	(3.5200)	(3.5755)	(3.6172)	(3.7582)
Stock	0.0198*	0.0230**	0.0218**	0.0248**
	(1.8434)	(2.1588)	(2.0368)	(2.3013)
Man	0.0275***	0.0258**	0.0281***	0.0293***
	(2.6905)	(2.5220)	(2.7558)	(2.8645)
Age_E	0.0004	0.0003	0.0003	0.0004
	(1.0036)	(0.6580)	(0.6638)	(0.9104)
Edu	-0.0035	-0.0014	-0.0030	-0.0018
	(-0.9489)	(-0.3696)	(-0.8142)	(-0.4817)
Cons	-0.1171***	-0.1208***	-0.1152***	-0.1480***
	(-2.8700)	(-2.9792)	(-2.8002)	(-3.6623)
Observations	2957	2957	2957	2957
Chi ²	462.1458	464.8385	459.4153	449.7868
Anderson-Rubin	21.99 (0.0000)	23.42 (0.0000)	15.64 (0.0004)	1.62 (0.4455)
Industry FE	YES	YES	YES	YES
Province FE	YES	YES	YES	YES

Note: *Statistically significant at the 10% level; **Statistically significant at the 5% level; ***Statistically significant at the 1% level; *t* statistics in parentheses.

internal ownership structure of enterprises. Therefore, the classification and regression comparison are conducted.

Regional Heterogeneity Test

Due to the significant imbalance in regional development in China, there are great differences in the level of economic development, ecological environment vulnerability and social organization development

in different regions, so the effects of entrepreneurs' behavior in different regions on the environmental investment may also show different patterns, so it is necessary to conduct regional heterogeneity tests. According to the general knowledge, China can be divided into three major regions: eastern, central and western, and the test results are shown in Table 12. First of all, by comparing the overall social organizations, it can be seen that in the east and west, the coefficient of social organization identities on environmental

Table 9. Instrumental Variable Method EPI_S (IV-Tobit).

	(1)	(2)	(3)	(4)
SG_A	0.4440***			
	(5.0586)			
SG_G		0.4327***		
		(5.1216)		
SG_I			0.3513***	
			(4.2715)	
SG_F				0.0163
				(0.2112)
Size	0.5694***	0.5757***	0.5743***	0.6108***
	(13.7747)	(14.0083)	(13.8703)	(14.9638)
Age_F	0.0269**	0.0273**	0.0295***	0.0336***
	(2.3598)	(2.3979)	(2.5952)	(2.9574)
Lev	0.9712***	0.9875***	0.9962***	1.0361***
	(3.4783)	(3.5434)	(3.5694)	(3.7055)
Stock	0.3486^	0.4236**	0.3952*	0.4610**
	(1.6063)	(1.9635)	(1.8259)	(2.1144)
Man	0.4866**	0.4521**	0.4998**	0.5263**
	(2.3066)	(2.1458)	(2.3721)	(2.4898)
Age_E	0.0032	0.0001	0.0001	0.0032
	(0.3710)	(0.0146)	(0.0060)	(0.3709)
Edu	-0.1407*	-0.0900	-0.1281*	-0.0982
	(-1.8298)	(-1.1814)	(-1.6694)	(-1.2698)
Cons	-10.7634***	-10.8887***	-10.7160***	-11.4956***
	(-12.5723)	(-12.7880)	(-12.4136)	(-13.5222)
Observations	2957	2957	2957	2957
Chi ²	1040.3634	1043.6968	1039.4394	1030.0124
Anderson-Rubin	25.61 (0.0000)	26.73 (0.0000)	18.43 (0.0001)	0.22 (0.8945)
Industry FE	YES	YES	YES	YES
Province FE	YES	YES	YES	YES

Note: *Statistically significant at the 10% level; **Statistically significant at the 5% level; ***Statistically significant at the 1% level; *t* statistics in parentheses.

investments is positive, and statistically significance at 1% level, while the central region is not statistically significant. By coefficient comparison, it can be found that the impact of social organization identities in the eastern region on environmental investment is higher than that in the western region. The possible reason is that the eastern region has now entered a stage of high-quality development, and government, enterprises and society are highly concerned about the quality of the ecological environment. At the same

time, the social organizations in the eastern region are relatively developed, and have performed better in providing services and restricting the behavior of their members, which will inevitably make entrepreneurs with social organization identity more concerned about their external image and restrict the environmental protection behavior of their own enterprises. Therefore, social organization identity plays a relatively large role in promoting enterprise investment in environmental protection.

Table 10. Instrumental Variable Method EPI_P (IV-Probit).

	(1)	(2)	(3)	(4)
SG_A	0.1625***			
	(4.7906)			
SG_G		0.1473***		
		(4.5354)		
SG_I			0.1196***	
			(3.7190)	
SG_F				0.0281
				(0.9504)
Size	0.1575***	0.1612***	0.1601***	0.1725***
	(10.1521)	(10.4552)	(10.3269)	(11.3945)
Age_F	0.0109**	0.0110**	0.0119***	0.0134***
	(2.3707)	(2.3889)	(2.5946)	(2.9245)
Lev	0.2439**	0.2508**	0.2537**	0.2667**
	(2.3159)	(2.3837)	(2.4152)	(2.5480)
Stock	0.0674	0.0975	0.0890	0.1096
	(0.7444)	(1.0813)	(0.9877)	(1.2131)
Man	0.0801	0.0755	0.0862	0.0956
	(1.0315)	(0.9751)	(1.1150)	(1.2393)
Age_E	0.0018	0.0008	0.0009	0.0023
	(0.5397)	(0.2532)	(0.2618)	(0.6724)
Edu	-0.0753**	-0.0572*	-0.0692**	-0.0618**
	(-2.4961)	(-1.9106)	(-2.3067)	(-2.0556)
Cons	-3.1148***	-3.1935***	-3.1212***	-3.4008***
	(-9.7289)	(-10.0465)	(-9.6782)	(-10.8305)
Observations	2921	2921	2921	2921
Chi ²	834.9967	834.5701	833.0777	826.8478
Anderson-Rubin	23.08 (0.0000)	20.81 (0.0000)	15.21 (0.0005)	1.06 (0.5874)
Industry FE	YES	YES	YES	YES
Province FE	YES	YES	YES	YES

Note: *Statistically significant at the 10% level; **Statistically significant at the 5% level; ***Statistically significant at the 1% level; *t* statistics in parentheses.

While the western region is relatively fragile in ecology and the environmental carrying capacity is small, so there are also higher requirements for the environmental protection behavior of enterprises. But on the other hand, as the western economy is relatively less developed and the development of social organizations is relatively insufficient, the government's development tasks are more focused on economic indicators with less ability to provide resources for environmental protection incentives, and the ability of

social organizations to play a role is relatively weak compared to the east. Therefore, entrepreneurs' social organization identities will inevitably have a weaker role in restricting the environmental protection behavior of enterprises. The central region is stronger than the west in terms of environmental carrying capacity, but weaker than the east in terms of economic development and the level of social organization development, so enterprises may focus on their economic performance, and the effect of social organization

Table 11. Mean Treatment Effect Across Samples.

	EPI_I	EPI_S	EPI_D
ATT- SG_A	0.0105** (2.3700)	0.3339 *** (4.1700)	0.0775*** (2.8000)
ATT- SG_G	0.0106** (2.4009)	0.4511*** (5.5300)	0.0961*** (3.9000)
ATT- SG_I	0.0071* (1.7600)	0.1819** (2.0100)	0.0579** (2.4300)
ATT- SG_F	-0.0009 (-0.26)	0.0788 (0.8500)	0.0397* (1.7200)

Note: *Statistically significant at the 10% level; **Statistically significant at the 5% level; ***Statistically significant at the 1% level; *t* statistics in parentheses.

identity on environmental protection behavior is not significant.

Further subdivision of social organizations shows that in the east, it is mainly the government-pushed organizations and industry associations that are playing important roles, which reflects the “double strong” feature that the eastern region not only has a developed market economy, but also a powerful government. In the western region, the government-pushed organizations play a significant role, which implies that the role of industry associations still needs to be further enhanced. The role of social organizations in the central region is not significant, which reflects that social organizations do not focus on environmental protection, but are more likely to focus on promoting enterprise economic development.

Industrial Heterogeneity Test

China’s private enterprises are less involved in the primary industry, mainly involving the secondary industry and the tertiary industry. Since the reform and opening-up, China mainly participates in the world’s industrial division with low-cost advantages, and China’s manufacturing enterprises are mainly located at the middle or low end of the global value chain which results in a lot of environmental pollution, so manufacturing enterprises are the key regulatory objects. While Services are generally less polluting, so firms suffer less environmental regulation. According to this, it is speculated that the effect of entrepreneurs’ social organization identities on promoting environmental investment is the largest in the secondary industry, followed by the service industry, and finally the primary industry. Table 13 gives an empirical analysis of this. From the perspective of the total social organization identity, the coefficients for environmental investment are positive both in the secondary and tertiary industries, while the coefficient of the former is significantly greater than that of the latter, and not significant in the primary industry. This is consistent with the previous analysis. Further analysis of different types of social

organizations shows that in the secondary and tertiary industries, government-pushed organizations and industry associations are significant, while the role of government-pushed organizations is stronger than that of industry associations, and the role of fellowship organizations is not significant, which is consistent with the previous basic regression.

Heterogeneity Test by the Levels of External Risks

External risks faced by enterprises will also affect their decision-making. Generally speaking, if the external risks faced by enterprises are too high, enterprises need to reduce unnecessary expenditures and improve viability, and if the external risks faced by enterprises are too low, they may lose the vigilance of investment failure probability and expand productive investment while reducing the proportion of expenditure on other non-productive investment. Moderate risks will allow enterprises to balance all aspects of investment, not only to do a good job of productive input, but also to maintain other non-productive inputs, taking into account different stakeholders. Therefore, it is speculated that the entrepreneurs’ social organization identity plays the largest role under the medium-external risks, followed by the low external risks, and the weakest under high external risks.

The research divides the external risks into three types, which are assigned as low risks, medium risks and high risks, and test them separately. The results are shown in Table 14. It can be seen that entrepreneurs’ total social organization identity has a positive and significant effect on environmental investment under low external risks and medium external risks, but not significant under high external risks. The effect is the strongest under medium external risks, which is consistent with the previous speculation. Further analysis of the different types of social organizations, it is found that under the low external risks, it is mainly the government-pushed organization identity that takes effect; under the medium external risks, the government-pushed social organization identity and the industry association identity play a significant role. However,

Table 12. Effects of Social Organizations on Environmental Investment by Regions (EPI_I).

	Eastern			Central			Western					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
SG_A	0.024*** (4.171)				0.013 (1.396)				0.017** (2.331)			
SG_G		0.026*** (4.821)				0.002 (0.180)				0.025*** (3.386)		
SG_I			0.020*** (3.787)				0.013 (1.476)				0.008 (1.197)	
SG_F				-0.005 (-0.988)				0.008 (1.077)				-0.000 (-0.065)
Size	-0.006** (-2.124)	-0.005** (-2.075)	-0.005** (-2.025)	-0.003 (-1.226)	0.002 (0.425)	0.003 (0.678)	0.002 (0.381)	0.003 (0.753)	0.006 (1.541)	0.005 (1.291)	0.007* (1.781)	0.007** (2.046)
Age_F	0.002*** (2.775)	0.002*** (2.674)	0.002*** (2.958)	0.002*** (3.320)	0.001 (0.982)	0.002 (1.114)	0.001 (0.990)	0.002 (1.056)	0.001 (1.143)	0.001 (1.058)	0.001 (1.289)	0.001 (1.329)
Lev	0.037** (2.051)	0.038** (2.108)	0.038** (2.107)	0.040** (2.241)	0.112*** (3.744)	0.114*** (3.811)	0.112*** (3.739)	0.113*** (3.786)	-0.013 (-0.508)	-0.020 (-0.755)	-0.010 (-0.375)	-0.009 (-0.353)
Stock	0.029** (2.069)	0.033** (2.351)	0.031** (2.188)	0.036** (2.523)	-0.005 (-0.199)	-0.001 (-0.046)	-0.003 (-0.127)	-0.003 (-0.118)	0.028 (1.344)	0.035* (1.657)	0.029 (1.391)	0.032 (1.509)
Man	0.042*** (2.932)	0.039*** (2.748)	0.043*** (3.018)	0.044*** (3.046)	-0.008 (-0.369)	-0.007 (-0.354)	-0.009 (-0.408)	-0.007 (-0.319)	0.025 (1.364)	0.021 (1.158)	0.026 (1.401)	0.027 (1.442)
Age_E	-0.000 (-0.610)	-0.001 (-1.002)	-0.001 (-1.016)	-0.001 (-0.920)	0.001 (1.360)	0.001 (1.332)	0.001 (1.284)	0.001 (1.481)	0.001* (1.851)	0.001* (1.819)	0.001* (1.750)	0.001* (1.838)
Edu	-0.005 (-0.965)	-0.002 (-0.373)	-0.005 (-0.910)	-0.002 (-0.399)	-0.004 (-0.482)	-0.003 (-0.400)	-0.004 (-0.458)	-0.004 (-0.510)	0.000 (0.057)	0.002 (0.315)	0.002 (0.244)	0.003 (0.430)
Cons	-0.033 (-0.597)	-0.037 (-0.675)	-0.025 (-0.452)	-0.065 (-1.191)	-0.182** (-2.252)	-0.206** (-2.553)	-0.174** (-2.131)	-0.215*** (-2.724)	-0.317*** (-4.481)	-0.308*** (-4.424)	-0.334*** (-4.648)	-0.356*** (-5.123)
Obs.	1592	1592	1592	1592	815	815	815	815	557	557	557	557

Table 12. Continued.

Pse-R ²	0.721	0.733	0.715	0.689	0.677	0.671	0.678	0.675	1.569	1.641	1.522	1.505
Chi ²	369.480	375.351	366.428	353.021	218.254	216.346	218.482	217.465	134.199	140.407	130.174	128.743
Industry FE	YES											
Province FE	YES											

Note: *Statistically significant at the 10% level; **Statistically significant at the 5% level; ***Statistically significant at the 1% level; *t* statistics in parentheses.

Table 13. Effects of Social Organization Identities on environmental investment by Industries (EPI_I).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(12)	(10)	(11)	(12)
	The primary industry			The secondary industry				The tertiary industry				
SG_A	-0.003 (-0.469)				0.027*** (4.964)				0.019** (2.127)			
SG_G		-0.011 (-1.616)				0.025*** (5.080)				0.020** (2.318)		
SG_I			0.006 (0.958)				0.017*** (3.530)				0.019** (2.213)	
SG_F				-0.003 (-0.471)				0.003 (0.542)				-0.003 (-0.431)
Size	0.012*** (2.918)	0.013*** (3.122)	0.011*** (2.727)	0.012*** (2.816)	-0.009*** (-3.693)	-0.009*** (-3.555)	-0.008*** (-3.314)	-0.007*** (-2.692)	0.007* (1.773)	0.007* (1.834)	0.007* (1.663)	0.009** (2.344)

Table 13. Continued.

Age_F	0.001 (0.831)	0.001 (0.874)	0.001 (0.559)	0.001 (0.784)	0.002*** (3.079)	0.002*** (3.008)	0.002*** (3.393)	0.002*** (3.649)	0.002 (1.193)	0.002 (1.192)	0.002 (1.193)	0.002 (1.324)
Lev	0.044 (1.632)	0.048* (1.764)	0.045 (1.644)	0.045 (1.646)	0.047*** (2.710)	0.047*** (2.720)	0.048*** (2.780)	0.051*** (2.911)	0.037 (1.322)	0.037 (1.338)	0.039 (1.398)	0.040 (1.439)
Stock	-0.016 (-0.939)	-0.019 (-1.118)	-0.019 (-1.128)	-0.015 (-0.881)	0.029** (2.362)	0.032*** (2.681)	0.032*** (2.621)	0.035*** (2.867)	0.013 (0.430)	0.014 (0.477)	0.017 (0.588)	0.021 (0.710)
Man	-0.010 (-0.659)	-0.010 (-0.623)	-0.010 (-0.605)	-0.011 (-0.692)	0.032** (2.223)	0.031** (2.122)	0.035** (2.372)	0.037** (2.555)	0.031 (1.627)	0.032* (1.687)	0.029 (1.503)	0.032* (1.648)
Age_E	0.000 (0.221)	0.000 (0.240)	0.000 (0.206)	0.000 (0.177)	-0.000 (-0.807)	-0.001 (-1.275)	-0.001 (-1.136)	-0.000 (-0.864)	0.002** (2.265)	0.002** (2.155)	0.002** (2.265)	0.002** (2.363)
Edu	-0.003 (-0.498)	-0.004 (-0.656)	-0.004 (-0.619)	-0.003 (-0.471)	-0.000 (-0.004)	0.003 (0.563)	0.001 (0.143)	0.002 (0.362)	-0.010 (-1.152)	-0.009 (-1.100)	-0.008 (-0.897)	-0.007 (-0.770)
Cons	-0.246*** (-3.454)	-0.257*** (-3.601)	-0.236*** (-3.269)	-0.238*** (-3.264)	0.170*** (2.956)	0.166*** (2.897)	0.161*** (2.786)	0.125** (2.187)	-0.384*** (-4.318)	-0.370*** (-4.122)	-0.392*** (-4.458)	-0.424*** (-4.851)
Obs.	235	235	235	235	1212	1212	1212	1212	1517	1517	1517	1517
Pse-R ²	-1.239	-1.285	-1.253	-1.239	-4.024	-4.049	-3.773	-3.525	0.305	0.306	0.307	0.299
Chi ²	64.069	66.455	64.770	64.073	196.219	196.578	183.980	171.854	192.840	193.724	193.724	188.492
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Province FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Note: *Statistically significant at the 10% level; **Statistically significant at the 5% level; ***Statistically significant at the 1% level; t statistics in parentheses.

Table 14. Effects of Social Organization Identities on Environmental Investment by Levels of External Risks (EPI_I).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Low risks			Medium risks			High risks					
SG_A	0.011**				0.025***				0.024			
	(1.969)				(4.560)				(1.238)			
SG_G		0.013**				0.025***				0.015		
		(2.201)				(4.760)				(0.928)		
SG_I			0.008				0.020***				0.015	
			(1.440)				(3.945)				(0.793)	
SG_F				0.001				-0.000				0.010
				(0.235)				(-0.090)				(0.543)
Size	-0.001	-0.001	-0.001	-0.000	-0.001	-0.001	-0.001	0.001	-0.004	-0.003	-0.003	-0.002
	(-0.356)	(-0.189)	(-0.301)	(-0.020)	(-0.430)	(-0.486)	(-0.276)	(0.472)	(-0.542)	(-0.400)	(-0.436)	(-0.199)
Age_F	0.001	0.001	0.001	0.001	0.002**	0.002**	0.002***	0.002***	0.002	0.002	0.002	0.003
	(1.114)	(1.133)	(1.223)	(1.336)	(2.441)	(2.393)	(2.662)	(3.021)	(1.123)	(1.222)	(1.177)	(1.303)
Lev	0.060***	0.057***	0.062***	0.062***	0.019	0.024	0.019	0.023	0.155***	0.155***	0.157***	0.164***
	(3.080)	(2.914)	(3.204)	(3.194)	(1.097)	(1.361)	(1.074)	(1.284)	(2.751)	(2.730)	(2.767)	(2.887)
Stock	0.008	0.010	0.010	0.013	0.027*	0.030**	0.028**	0.031**	-0.058	-0.055	-0.051	-0.054
	(0.546)	(0.717)	(0.727)	(0.882)	(1.951)	(2.226)	(2.053)	(2.278)	(-1.003)	(-0.963)	(-0.891)	(-0.936)
Man	0.030**	0.027*	0.031**	0.031**	0.028**	0.027**	0.028**	0.029**	0.008	0.010	0.016	0.018
	(2.007)	(1.784)	(2.037)	(2.069)	(2.171)	(2.100)	(2.172)	(2.226)	(0.178)	(0.225)	(0.340)	(0.388)
Age_E	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.002	0.002
	(0.653)	(0.370)	(0.394)	(0.495)	(0.322)	(0.023)	(0.061)	(0.321)	(1.266)	(1.251)	(1.184)	(1.328)
Edu	-0.011**	-0.011*	-0.011**	-0.011**	-0.003	0.000	-0.002	0.000	0.018	0.021	0.020	0.018
	(-2.008)	(-1.926)	(-2.001)	(-1.982)	(-0.576)	(0.081)	(-0.439)	(0.036)	(1.019)	(1.157)	(1.094)	(1.006)
Cons	-0.067	-0.067	-0.062	-0.076	-0.115**	-0.115**	-0.114**	-0.154***	-0.328*	-0.352*	-0.345*	-0.389**
	(-1.130)	(-1.123)	(-1.033)	(-1.283)	(-2.174)	(-2.195)	(-2.141)	(-2.917)	(-1.732)	(-1.876)	(-1.798)	(-2.081)
Obs.	668	668	668	668	1911	1911	1911	1911	385	385	385	385

Table 14. Continued.

Pse-R ²	-40.736	-40.947	-40.347	-39.912	0.687	0.691	0.680	0.656	0.589	0.586	0.585	0.583
Chi ²	189.984	190.969	188.169	186.142	453.901	455.918	448.688	433.158	127.783	127.116	126.889	126.556
Industry FE	YES											
Province FE	YES											

Note: *Statistically significant at the 10% level; **Statistically significant at the 5% level; ***Statistically significant at the 1% level; *t* statistics in parentheses.

Table 15. Effect of Social Organization Identities on Environmental Investment by shareholding structures (EPI_I).

	Non-absolute holding				Absolute holding				Full holding			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
SG_A	0.032*** (2.617)				0.014** (2.011)				0.019*** (3.227)			
SG_G		0.008 (0.733)				0.023*** (3.277)				0.021*** (3.668)		
SG_I			0.042*** (3.689)				0.006 (0.982)				0.012** (2.189)	
SG_F				0.006 (0.557)				-0.001 (-0.240)				0.001 (0.140)
Size	-0.011**	-0.008	-0.011**	-0.008	-0.009**	-0.009**	-0.008**	-0.008**	-0.002	-0.002	-0.001	-0.000

Table 15. Continued.

Age_F	(-2.114)	(-1.545)	(-2.166)	(-1.486)	(-2.479)	(-2.488)	(-2.322)	(-2.161)	(-0.684)	(-0.787)	(-0.502)	(-0.001)
	0.002	0.002	0.001	0.002	0.002***	0.002***	0.003***	0.003***	0.001	0.001	0.001*	0.002*
	(1.031)	(1.173)	(0.713)	(1.207)	(2.845)	(2.835)	(3.016)	(3.130)	(1.524)	(1.413)	(1.812)	(1.915)
Lev	-0.024	-0.020	-0.024	-0.019	0.050**	0.049**	0.052**	0.052**	0.059***	0.060***	0.062***	0.065***
	(-0.633)	(-0.535)	(-0.642)	(-0.508)	(1.999)	(1.968)	(2.041)	(2.041)	(3.067)	(3.179)	(3.247)	(3.392)
Stock	0.041	0.044*	0.039	0.043	0.011	0.010	0.014	0.016	0.014	0.017	0.018	0.020
	(1.581)	(1.669)	(1.526)	(1.623)	(0.660)	(0.582)	(0.819)	(0.940)	(0.744)	(0.935)	(0.984)	(1.048)
Man	0.006	0.010	0.002	0.013	0.029	0.021	0.032*	0.031	0.042***	0.042***	0.042***	0.043***
	(0.205)	(0.362)	(0.074)	(0.444)	(1.530)	(1.108)	(1.670)	(1.631)	(2.966)	(2.939)	(2.951)	(3.020)
Age_E	0.001	0.001	0.000	0.001	-0.000	-0.000	-0.000	-0.000	0.001*	0.001	0.001	0.001*
	(0.488)	(0.459)	(0.167)	(0.603)	(-0.282)	(-0.451)	(-0.518)	(-0.512)	(1.661)	(1.499)	(1.449)	(1.685)
Edu	-0.000	-0.000	-0.001	-0.001	-0.012**	-0.012*	-0.011*	-0.011*	0.003	0.005	0.003	0.005
	(-0.043)	(-0.039)	(-0.120)	(-0.135)	(-1.984)	(-1.887)	(-1.800)	(-1.693)	(0.466)	(1.002)	(0.575)	(0.825)
Cons	-0.013	-0.057	0.016	-0.073	0.045	0.053	0.041	0.032	-0.139**	-0.141**	-0.140**	-0.172***
	(-0.116)	(-0.496)	(0.144)	(-0.643)	(0.647)	(0.762)	(0.578)	(0.455)	(-2.311)	(-2.353)	(-2.300)	(-2.878)
Obs.	445	445	445	445	640	640	640	640	1482	1482	1482	1482
Pse-R ²	0.968	0.934	1.006	0.932	2.653	2.747	2.611	2.598	0.768	0.774	0.756	0.747
Chi ²	175.843	169.529	182.620	169.300	191.706	198.441	188.636	187.730	374.881	377.982	369.264	364.484
Industry FE	YES											
Province FE	YES											

Note: *Statistically significant at the 10% level; **Statistically significant at the 5% level; ***Statistically significant at the 1% level; *t* statistics in parentheses.

Table 16. Environmental Investment and Corporate Economic Performance.

	(1)	(2)	(3)
EPI_S	0.0191*** (2.7302)		
EPI_I		0.8588*** (6.2651)	
EPI_D			0.0696** (2.5693)
Size	-0.0669*** (-11.7702)	-0.0568*** (-10.2688)	-0.0657*** (-11.7400)
Age_F	0.0042** (2.4386)	0.0040** (2.3385)	0.0042** (2.4394)
Lev	-0.0421 (-1.0646)	-0.0468 (-1.1922)	-0.0408 (-1.0333)
Stock	0.1314*** (3.6685)	0.1264*** (3.5598)	0.1377*** (3.8581)
Man	0.0285 (1.0402)	0.0234 (0.8590)	0.0312 (1.1406)
Age_E	-0.0012 (-0.9921)	-0.0014 (-1.1743)	-0.0013 (-1.0221)
Edu	0.0392*** (3.5078)	0.0382*** (3.4392)	0.0402*** (3.5999)
Cons	1.1742*** (9.9890)	1.0355*** (8.9447)	1.1451*** (9.8525)
Observations	2757	2757	2757
Pse-R ²	0.0462	0.0528	0.0460
Chi ²	220.5186	252.0075	219.6692
Industry FE	YES	YES	YES
Province FE	YES	YES	YES

Note: *Statistically significant at the 10% level; **Statistically significant at the 5% level; ***Statistically significant at the 1% level; *t* statistics in parentheses.

under the high external risks, the identities of different social organizations do not play a significant role.

Heterogeneity Test by Shareholding Structures

Most private enterprises in China are family enterprises, and their equity is mainly owned by investors themselves or family members. If the modern enterprise system of family enterprises is not sound, it may lead to unscientific decision-making and narrow channels of social resources, thus leading to the weak effect of social organization identity. There may also be no external supervision, and the consideration of the interests of stakeholders may be relaxed; or even if

they know there is external concern, they do not care about its negative impact. If an enterprise introduces external equity, such as state-owned capital, foreign capital, or other equity capital, the enterprise will have a certain degree of publicity, a certain degree of scientific decision-making and a multi-channel of resources.

According to the proportion of entrepreneurs and family members in the equity of owners, this paper divides the shareholding structure of enterprises into three categories, namely full holding (accounting for 100%), absolute holding (greater than 50% and less than 100%), and non-absolute holding (not more than 50%), which are tested separately, and the results are shown in Table 15. For the effects of total entrepreneurs' social

organization identity, there are great differences in environmental investment under different shareholding structures. Under the non-absolute holding structure, the effect of social organization identity is the strongest, which is significantly higher than that of the other two types of structures. The exception here is that in the case of full holding, the effect of social organization identity is slightly stronger than that of absolute holding. It may be due to the fact that if the entrepreneur and family member are fully controllers, the environmental pressure they face is not shared by other equity investors, and if the standard of environmental protection punishment is touched, all the responsibilities will be borne by the entrepreneur himself and the family member, so in this case, the effect is slightly greater than the absolute holding situation.

The Test of Enterprise Economic Performance

As a rational entrepreneur, increasing investment in environmental protection should be conducive to the improvement of enterprise economic performance in the long run, so as to be conducive to the sustainable development of enterprises. Therefore, the research further examines the relationship between environmental investment and the economic performance of enterprises which is represented by the net profit margin on sales. Table 16 reports the impact of environmental investment scale, environmental investment intensity and environmental investment propensity on the economic performance of enterprises. The results show that the three types of indicators of environmental investment of enterprises have a significant positive impact on their economic performance, so the positive effects of entrepreneurs' social organization identity on environmental investment are beneficial to the long-term development of enterprises.

Conclusions

Based on the latest (2018) Chinese private enterprises sampling survey data, the research empirically examines the effects of entrepreneurs' social organization identity on enterprise environmental investment. The results show that: (1) The social organization identity of private entrepreneurs has a significant positive effect on promoting the environmental investment of enterprises. This significant positive effect is not only manifested in the intensity of environmental investment, but also in the scale and propensity of environmental investment. (2) In terms of different types of social organizations, government-pushed organization identity and industry association identity has positive and large influence on environmental investment, whereas the identity of fellowship organizations has little impact. And the identity of government-pushed organizations shows stronger effect than that of industry associations. (3) For different regions, the effects are significant in

the eastern and western regions, while not significant in the central region, and the positive effect in the eastern region is the strongest. (4) For different industries, the effects are significant in the secondary and tertiary industries, while not significant in the primary industry, and the effect in the secondary industry is the largest. (5) In terms of different external risks enterprises are facing, the effect is the most significant under medium risks, followed by low risks, and the effect under high risks is not significant. (6) For different holding structures of enterprises, the effect is most significant when the proportion of the equity ownership of the entrepreneur himself and family members is not more than half, followed by the situation of 100% full shareholding, and the smallest effect is in the absolute shareholding structure; (7) The environmental protection investment of private enterprises has a significant positive role in promoting the return on net assets of enterprises.

Our study provides evidence of the role of private entrepreneur social organization identity on environmental investment. The policy implications of this article are mainly as follows:

First, promote the reform of reducing administration and decentralization. The government needs to promote reforms in clarifying the relationship between the government and the associations and accelerating the transformation of functions. Although the main body that clarifies this relationship is the government and social organizations, the promoter is the government. The government should change its ideological concepts and work style, formulate relevant systems, standardize government administrative behavior, and earnestly improve the government's service awareness and ability to social organizations, so as to promote and enhance the ability of social organizations to perform their duties.

Second, formulate social organization development plans. At present, due to the complete decoupling between the government and the associations promoted by policies and regulations, in the short term, there are certain degrees of disorderly competition, small scale, and low service capacity in the development of social organizations. For social organizations, administrative decoupling is not functional decoupling, not *laissez-faire*, left unchecked, the government should strengthen the investigation and study of social organizations on the basis of local legislation, and formulate social organization development plans. Social organizations that have not organized activities for a long time and cannot reflect their functions should be deregistered. Social organizations with similar names, similar business fields, and serious cross-membership should be merged. On this basis, the government should carry out planning and classification guidance on the layout of social organizations, development priorities and competition rules.

Third, strengthen assessment and supervision of social organizations. The outdated approach of emphasizing social organization evaluation over forms

and fees while ignoring oversight must be changed. It is necessary to construct a social organization evaluation system and conduct regular evaluations of social organizations' compliance with discipline and law, institutional construction, service capabilities, and service performance, so as to provide a basis for public services and supervision for social organizations. At the same time, it is also vital to strengthen supervision to avoid entrepreneurs and social organizations becoming vassals of leading enterprises, which only represent the will and interests of a small number of members of the organizations.

Finally, this research still has some known limitations. The information in this study was gathered in 2018 as part of the 13th national private enterprise sampling survey. The data from recent years cannot be retrieved, despite being the most recent iteration of the current continuous survey data of official private firms at the national level. Whether there are any additional avenues that could impact corporate environmental spending is another consideration. This will be improved by future research.

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Conflict of Interest

The authors declare no conflict of interest.

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