Busting the ‘Princeling’? Demystifying the Effect of Corporate Depoliticization on Green Innovation: The Moderating Effect of Politician Turnover

Fei Tang 1,2

1 School of Business, Central South University, Changsha 410083, China; F.Tang@lboro.ac.uk
2 Institute for Innovation and Entrepreneurship, Loughborough University, London E20 3BS, UK

Abstract: China’s anticorruption efforts and depoliticized provisions trigger government officials to resign from firms, terminating corporate political connections established through managers. This paper addresses corporate depoliticization and its effect on firms’ green strategies. We disentangled how and why depoliticized firms actively take on green innovation and the moderating effect of politician turnover on the above relationship. This paper utilized the data related to China’s privately operated firms from 2008 to 2017 to test its hypothesis. Using the methods of propensity score matching (PSM) and difference-in-difference (DID) to mitigate endogeneity issues, the results indicate that (1) corporate depoliticization can foster green innovation; (2) the exploration of the boundary condition of politician turnover shows that the positive relationship between corporate depoliticization and green innovation is enhanced when depoliticized firms have experienced the changes of government officials; (3) anticorruption shocks can significantly and positively affect green innovation when interacted with a firm with depoliticization. These findings enrich corporate depoliticization and green innovation research.

Keywords: anticorruption shocks; corporate depoliticization; green innovation; politician turnover

1. Introduction

Economic growth in developing countries has posed extensive environment pollution and resource consumption [1,2], and thus, environment degradation and ecological damage are rapidly increasing [3,4]. As such, the increasingly serious environmental degradation has forced the government to release a series of legislative and administrative policy for rectifying the situation in emerging market and achieving sustainable development [5–7]. Given that green innovation is regarded as an essential approach to mitigate these environmental issues [8], it is, however, costly and risky, and requires a mass of resource. Extensive studies have been made to examine whether and how such environmental regulations and political policies can stimulate the implementation of firms’ green innovation [1,9].

Thus, researchers recently adopted various econometric models to check the motivation and contribution of stakeholders on environmental development, and they find that stakeholders, such as government, can improve environmental performance as well as firms’ green behaviors [10–12]. As such, the government has used its environmental laws to regulate firms’ polluting operations. The laws and regulations aim to stimulate firms to transform their operational mode, and firms are required to operate in a sustainable green innovative mode rather than by using high-energy consumption or high-polluting processes [13,14]. In fact, China’s government offers special subsidies for firms contributing to green and sustainable economic development. These requirements and expectations can result in improving the quantity and quality of green innovation, so as to accelerate the development of a greener economy.

China’s governments hold the power to allocate the critical resource, which stimulate firms to build political connections to access critical resource [13,15], which may affect firms’
green innovation. Political connections offer benefits for firms with respect to competitive and regulatory forces through the access the offer the companies to political legitimacy and key resources [15–17]. Firms can receive privilege and support from being connected with the government [12,16]. Therefore, it is not surprising that studies have emerged to explore the determinants of strategic decisions and firm outcomes from the perspective of political connections [19–21]. For example, Lin et al. [10] used an event study approach to investigate how firms adopt corporate environmental responsibility to build political connections and how such actions affect firm performance.

However, few studies have examined the depoliticization of firms (i.e., the loss of political connections). In fact, corrupt politicians have been removed from government and, thus, have fallen out of power in disgrace during China’s anticorruption campaign [22,23]. China’s anticorruption activities have enacted various provisions, which have subjected firms to depoliticization since 2012. For example, a prevailing indication of corporate depoliticization is triggered by the enactment of a resolution provision from China’s central organization department (i.e., ‘Document No. 18’ in October 2013). This provision restricted officials’ involvement in corporate senior managers and led to a wave of depoliticization [2,24]. In addition, the question of how would the depoliticization affect firms’ green strategies is unclear.

Depoliticized firms tend to embed environmental protection and greener development in their strategic planning processes [25]. Green actions can be an effective way to address environmental issues [7,26]. Depoliticized firms can receive political legitimacy and government subsidies after they meet government expectations about environmental goals [27–29]. They have also committed to pursuing political legitimacy by the acceptance and approval of the government’s requirements that are associated with green development [28,30]. Green innovation is a key indicator of political strategies in emerging economies and is treated as an approach to gain access to the government and to improve a firm’s social reputation [15,31,32]. Depoliticized firms can implement green innovation to mitigate the adverse shocks of disconnection with governmental officials, as China’s government has strengthened the importance of green innovation with respect to finding solutions to environmental problems. Thus, corporate depoliticization can cause firms to respond actively to green innovation [2,33–35].

We examined why and how depoliticized firms actively engage in green innovation and the moderating effect of politician turnover on this relationship. This paper used the data related to China’s privately operated firms from 2008 to 2017 for the hypothesis test, and we used the methods of propensity score matching (PSM) and difference-in-difference (DID) to mitigate endogeneity issues. The findings indicate that (1) corporate depoliticization can promote green innovation; (2) the moderating effect of politician turnover is positive and significant, which indicates that the positive relationship between corporate depoliticization and green innovation is enhanced when depoliticized firms have experienced the changes of government officials; (3) anticorruption shocks have an significant and positive influence on green innovation when interacted with a firm with depoliticization.

This paper contributes to the literature in three ways. First, this paper extends the corporate depoliticization literature. Prior research has paid scarce attention to firm depoliticization [15,17]. This paper demystifies the concept of corporate depoliticization and assesses its effect on firms’ strategies, and thereby contributes to corporate depoliticization literature. Second, we contribute to green innovation literature by exploring the relationship between corporate depoliticization and green innovation and the boundary condition of the above relationship. Prior studies show that green innovation can promote firms’ legitimacy building [5,16], and this study finds that corporate depoliticization tends to cause firms to foster green innovation. Our study sheds new light on the driver of green innovation. Third, our theoretical and empirical frameworks are based on the context of China, which is experiencing institutional transitions. Therefore, we hope to contribute to the emerging-market literature and provide beneficial insights for other transition economies by exploring the depoliticized effect in a similar context.
This paper includes the following sections: Introduction; Literature review; Materials and methods; Results; Discussion; and Conclusions. In the next section, this study reviews the literature on the corporate depoliticization, green innovation, and politician turnover. We then hypothesize that firms in China use green innovation to connect with the government, supporting the idea that corporate depoliticization enhances green innovation performance. We further hypothesize that this above relationship tends to be moderated by politician turnover, as politician changes may strengthen the depoliticized effects. Next, we express the materials and methods to test our hypotheses, we adopt various models for our empirical test, such as the PSM model and Heckman two-stage model. We consider the factor of the anticorruption campaign that may mitigate the depoliticized effect and we utilize the DID model to address this issue. Lastly, we discuss our results and their implications, and conclude by discussing the findings, limitations, and possible avenues for future research.

2. Literature Review

2.1. The China’s Anticorruption Shocks and Corporate Depoliticization

Corruption can cause social uncertainty and be a detriment to economic development; furthermore, it can reduce the reputation of China’s communist government. For example, corruption both increases the cost and risk of corporate operation and accelerates the dissipation and erosion of national assets. Hence, corruption often brings serious hindrances to the development of China’s economy and political system. Addressing the destructiveness of corruption, China’s government has declared the need to fight against corruption and has taken various measures to solve this problem. When president Xi Jinping was appointed as the party chief in 2012, he launched the unprecedented anticorruption campaign, with a vow to ‘fight corruption at every level, punish every corrupt official, and eradicate the soil that breeds corruption’ [23].

China’s ‘18th National Congress’ political anti-corruption campaign has been traumatic and has subjected many firms to depoliticization since 2012, as corrupt officials were sacked. Firms were encouraged to jettison their political connections, which is the essence of corporate depoliticization. For example, Renguo Yuan, the manager of China Kweichow Moutai Distillery (Group) Co. Ltd., was the deputy to the 12th National People’s Congress and was referred to the judiciary for corruption, which had adverse effects on firm value. In fact, nearly 182,000 officials were punished for corrupt behaviors and abuse of political power in 2013. Furthermore, China’s Central Organisation Department enacted a resolution regulation, ‘Document No. 18’, in October 2013. This regulation restricted officials’ involvement in corporate manager positions and led to a wave of corporate depoliticization [2,24]. The opinion issued in 2013 resulted in a widespread situation where government cadres and politically connected managers have been dismissed from firms.

2.2. Corporate Depoliticization and Green Innovation

Green innovation is a weapon of competition in product markets, such as green patents [36,37]. With the problems of environmental pollution, the incentives for green innovation have become an important political goal for China’s government [38,39]. Green innovation is treated as a corporate political strategy, which provides access to legitimacy building and repairing. Thus, corporate depoliticization may positively related with green innovation.

Corporate depoliticization led firms to take on green innovation for legitimacy rebuilding. Green innovation can provide a new access to legitimacy by depoliticized firms fulfilling governmental sustainable expectations [11,40,41]. The reduction of legitimacy from corporate depoliticization can expose pressure for firm development. Firms seek alternative access to interact with the government for legitimacy building. China’s government puts forward the strategic goal of building a greener and innovative country to an unprecedented height. Firms actively respond to the call of the government to carry out green activities, including green innovation. As a corporate political strategy, green
innovation can create a favorable institutional environment for depoliticized firms, obtain for them maximum economic benefits from the government policy environment, and, thus, restore their legitimacy.

Corporate depoliticization stimulates firms’ green innovation to get government supports and resources. Depoliticized firms need to seek alternative ways to gain governmental resources and support, which could compensate for their drop in competitiveness after the loss of their political connections [2,42]. China is undergoing rapid economic growth, but this is being accompanied by severe environmental pollution [3,6,43]. Increasingly, environmental issues have damaged the development of the sustainable economy [13,44]. Green innovation is treated as an essential measure for coordinating environmental protection and economic development [6,13,45]. It has also attracted the attention of China’s government [1,21]. The government provides various resources and subsidies for firms’ green innovation. Thus, depoliticized firms may become involved in green innovation for external resources.

If firms actively engage in green innovation, it can help them gain an alternative source of social reputation to reduce the pressure on their companies from depoliticization [46]. When firms lose their political connection, they can repair their image by going green [47,48]. For example, green activities improve social reputation [49,50], increase consumer brand loyalty [48], and construct good relationships with stakeholders [51]. Corporate depoliticization can perhaps positively influence green innovation; thus, we propose that:

**Hypothesis H1 (H1).** Corporate depoliticization is positively associated with green innovation.

2.3. The Moderating Effect of Politician Turnover

The government is a complex political system consisting of various officials who hold different positions of authority and political power and have different means of deploying resources and releasing regulations. China has a hierarchical government, from the central government to the local government, and these government officials hold distinctly conflicting stances and interests [52–54]. Firms may construct connections with different government officials. Hence, the turnover of politicians can affect the linkages between business and government. These officials’ change of position can, therefore, moderate the relationship between corporate depoliticization and green innovation. To better demonstrate the boundary condition of the relationship between corporate depoliticization and green innovation, we examine the moderating effect of politician turnover on the above relationship.

The turnover of politicians can accelerate firm’s depoliticization and, thus, cause firms to engage in green innovation. The turnover of politicians forces firms to drop certain political connections accordingly. Politician turnover shapes the relationship between firms and government and breaks a firm’s access to government resources [55,56]. The change of officials’ positions can bind the firms’ stances to identify the officials to whom their managers are connected. Furthermore, the motivation to depoliticize firms turns stronger in situations of politician turnover, which fosters firms’ engagement in green innovation to rebuild connections with new politicians [42]. Firms’ green innovation can be an alternative way to construct connections and gain support from the government [57,58], as politicians play a crucial role in local policy decision making, and green innovation can help firms to become more competitive in an environment of unpredictable politician turnover [59]. Therefore, politician turnover may strengthen the positive relationship between corporate depoliticization and green innovation. We thus predict that:

**Hypothesis H2 (H2).** Politician turnover enhances the positive relationship between corporate depoliticization and green innovation.
3. Materials and Methods

3.1. Data Collection

This paper used data from the China Stock Market & Accounting Research database. Our first step was to select the sample between 2008 and 2017. Our sample was restricted to this period because 2008 was the first year in which managers disclosed their biographical information about political connections to the CSMAR database and 2017 was the latest available data at the beginning of our study.

We manually sorted out the initial political connections samples and obtained 9096 observations of corporate depoliticization. Next, we excluded specially treated (ST) firms for their abnormal financial status (553 observations), foreign capital stock listed in China (51 observations), state-owned enterprises (3095 observations), and firms with missing control variables (821 observations). Our final sample included 4576 observations. We collected all data from the CSMAR database and corporate annual reports.

3.2. Measurements

**Dependent variable: green innovation.** The visible form of green patent becomes the green innovation. Corporate patent counts have been shown to be related to changes in firm value. Literature often employs the number of citations per patent as a complementary measure of patent counts [1,41,60]. However, in China, there seldom exists any data on patent citations. Thus, we adopted the patent applications to measure green innovation, denoted as ‘green’.

**Independent variable: corporate depoliticization.** This research defined corporate depoliticization as a firm losing political connections. With reference to Faccio’s [13] research on political connections, we sorted out whether top managers have a politically relevant background [13,15,17]. The politically relevant background is that top managers have an experience as cadres in the government and served as representatives of the National People’s Congress, the People’s Political Consultative Conference, and the China’s Communist Party [12]. Thus, we obtained the initial sample of political connections. We then manually sorted politically connected samples and introduced a dummy variable, which equals 1 in the year firms’ loss of political connection, 0 otherwise. This variable is denoted as ‘depoliticization’.

**Moderating variable: politician turnover.** We introduced a dummy variable to measure politician turnover [55]; the value is 1 if the provincial secretary or governor changes, and 0 otherwise, denoted as ‘turnover’.

**Control variables.** We controlled the following variables in our model. Economic uncertainty: we selected China’s economic policy uncertainty to measure economic uncertainty [61]. The data comes from the website of Baker’s research team, denoted as ‘uncertainty’. Ownership concentration: concentrated shareholders can better supervise executives’ environmental behavior [12]. We measured it as share percentage of the largest shareholder, denoted as ‘top’. CEO duality: we introduced a dummy variable, CEO duality, 1 if the CEO and the chairperson of the board are the same person, 0 otherwise [62], denoted as ‘duality’. Board independence: the self-serving behavior of executives could be monitored by independent directors [63]. We measured board independence as the ratio of independent directors and denoted this as ‘independence’ [64,65]. Firm Size: firm size was measured as the logarithm of the total assets of the firm, denoted as ‘size’. Firm slack: we adopted the proportion of current assets divided by current liabilities to measure organization slack, denoted as ‘slack’. Firm performance: we measured as return on assets. It is denoted as ‘roa’. Market competition: following prior literature, we controlled for the context variables of competition and market competition was measured as the concentration ratio of top 4 firms. It is denoted as ‘competition’. Firm listing age: we use a firm’s listing years to measure corporate listing age, noted by ‘listage’. Region: we introduce a dummy variable to measure region, 1 for firms located in eastern China, 0 otherwise.
3.3. Econometric Specifications

**Baseline model.** We constructed the following research models to test our hypothesis: ‘green’ for green innovation, ‘depoliticization’ for corporate depoliticization, ‘turnover’ for politician turnover, ‘uncertainty’ for economic uncertainty, ‘top’ for ownership concentration, ‘duality’ for CEO duality, ‘independence’ for board independence, ‘size’ for firms’ size, ‘slack’ for firm slack, ‘roa’ for firm performance, ‘competition’ for industry competition, ‘listage’ for firm listing age, and ‘region’ for firms’ location.

\[
Green = \alpha_0 + \alpha_1\text{depoliticization} + \alpha_2\text{turnover} + \alpha_3\text{uncertainty} + \alpha_4\text{top} + \alpha_5\text{duality} + \alpha_6\text{independence} + \alpha_7\text{size} + \alpha_8\text{slack} + \alpha_9\text{roa} + \alpha_{10}\text{competition} + \alpha_{11}\text{listage} + \alpha_{12}\text{region} + \varepsilon
\]

\[
Green = \alpha_0 + \alpha_1\text{depoliticization} + \alpha_2\text{turnover} + \alpha_3\text{depoliticization} \times \text{turnover} + \alpha_4\text{uncertainty} + \alpha_5\text{top} + \alpha_6\text{duality} + \alpha_7\text{independence} + \alpha_8\text{size} + \alpha_9\text{slack} + \alpha_{10}\text{roa} + \alpha_{11}\text{competition} + \alpha_{12}\text{listage} + \alpha_{13}\text{region} + \varepsilon
\]

**PSM model.** We utilized the regression models to match depoliticized firms and non-depoliticized firms that have similar firm characteristics to examine whether firms with depoliticization take on green innovation more, where f ( ) is the matched function, and depoliticization is a dummy variable that could be depoliticized firms or non-depoliticized firms. The covariates included ‘turnover’ for politician turnover, ‘uncertainty’ for economic uncertainty, ‘top’ for ownership concentration, ‘duality’ for CEO duality, ‘independence’ for board independence, ‘size’ for firms’ size, ‘slack’ for firm slack, ‘roa’ for firm performance, ‘competition’ for industry competition, ‘listage’ for firm listing age, and ‘region’ for firms’ location. We sorted out the matched observations and rerun baseline models.

\[
\text{Depoliticization} = f(\text{turnover} + \text{uncertainty} + \text{top} + \text{duality} + \text{independence} + \text{size} + \text{slack} + \text{roa} + \text{competition} + \text{listage} + \text{region})
\]

**Heckman two-stage model.** We conducted Heckman two-stage models to mitigate the omit variable issues, where f ( ) is the probit model of the first stage, and greendummy is a dummy variable that could be the adoption of firms or others. We controlled for a series of covariates, including economic uncertainty, ownership concentration, firm leverage, firm age, state ownership and region in the first stage. We then calculated Inverse Mill Ratio (mills) for the second stage and reran baseline model by adding the variable of mills.

\[
\text{Greendummy} = f(\text{economicuncertainty} + \text{ownershipcontration} + \text{firmleverage} + \text{firmage} + \text{stateownership} + \text{region})
\]

\[
Green = \alpha_0 + \alpha_1\text{depoliticization} + \alpha_2\text{turnover} + \alpha_3\text{uncertainty} + \alpha_4\text{top} + \alpha_5\text{duality} + \alpha_6\text{independence} + \alpha_7\text{size} + \alpha_8\text{slack} + \alpha_9\text{roa} + \alpha_{10}\text{competition} + \alpha_{11}\text{listage} + \alpha_{12}\text{region} + \text{mills} + \varepsilon
\]

\[
Green = \alpha_0 + \alpha_1\text{depoliticization} + \alpha_2\text{turnover} + \alpha_3\text{depoliticization} \times \text{turnover} + \alpha_4\text{uncertainty} + \alpha_5\text{top} + \alpha_6\text{duality} + \alpha_7\text{independence} + \alpha_8\text{size} + \alpha_9\text{slack} + \alpha_{10}\text{roa} + \alpha_{11}\text{competition} + \alpha_{12}\text{listage} + \alpha_{13}\text{region} + \text{mills} + \varepsilon
\]

**DID model.** We conducted a DID model to test the depoliticized effect by considering anticorruption campaign. Our interest variable is corporate depoliticization, which is defined as depoliticization \( \times 2013_{\text{post}} \) (treat \( \times \) time), namely, the interaction of treatment variable and time variable according to the DID model. The depoliticization \( \times 2013_{\text{post}} \) is the interaction of corporate depoliticization(treat) and 2013_{\text{post}} (year); the depoliticization \( \times \) turnover \( \times 2013_{\text{post}} \) is the interaction of corporate depoliticization, 2013_{\text{post}}, and politician
turnover. As China’s anticorruption activities started, we defined the 2013\textsubscript{post} as equal to 1 for observations from 2013 to 2017, and 0 otherwise.

\[
\text{Green} = \alpha_0 + \alpha_1 \text{depoliticization} \times 2013\text{post} + \alpha_2 \text{turnover} + \alpha_3 \text{uncertainty} + \alpha_4 \text{top} + \alpha_5 \text{duality} + \alpha_6 \text{independence} + \alpha_7 \text{size} + \alpha_8 \text{slack} + \alpha_9 \text{roa} + \alpha_{10} \text{competition} + \alpha_{11} \text{listage} + \alpha_{12} \text{region} + \varepsilon
\]

\[
\text{Green} = \alpha_0 + \alpha_1 \text{depoliticization} \times 2013\text{post} + \alpha_2 \text{turnover} + \alpha_3 \text{depoliticization} \times \text{turnover} \times 2013\text{post} + \alpha_4 \text{uncertainty} + \alpha_5 \text{top} + \alpha_6 \text{duality} + \alpha_7 \text{independence} + \alpha_8 \text{size} + \alpha_9 \text{slack} + \alpha_{10} \text{roa} + \alpha_{11} \text{competition} + \alpha_{12} \text{listage} + \alpha_{13} \text{region} + \varepsilon
\]

4. Results
4.1. Descriptive Statistics and Analysis

The source of Table 1 is the results of basic descriptive statistics for all variables. The coefficient of correlations is lower than 5, thus there is not a serious multicollinearity problem.

4.2. Baseline Regression Test

The source of Table 2 is the results of baseline regression model. In Table 2, we adopted the Poisson model for our hypothesis testing. Model 1 focuses on the regression of dependent variable and control variables, and Model 2 adds the dependent variable corporate depoliticization. Model 2 reports the result of the effect of corporate depoliticization on green innovation, and the result show that corporate depoliticization positively and significantly affect green innovation (\(\beta = 0.259, p < 0.01\)). Therefore, H1 is supported. Model 3 reports the results of the moderating effect of politician turnover on the relationship between corporate depoliticization and green innovation (\(\beta = 0.494, p < 0.01\)). We can find that politician turnover positively and significantly moderates the above relationship, and H2 is supported. More specifically, Model 1 reports the result of regression of dependent variable, moderating variable and control variables; Model 2 reports the result of regression of dependent variable, independent variable, moderating variable and control variables, and it is the main effect test; Model 3 reports the result of regression of dependent variable, independent variable, moderating variable, interaction of independent variable and moderating variable and control variables, and it is the moderating effect test.

To better illustrate the moderating effects of politician turnover, we plotted the moderating effects by using one standard deviation above and below the mean to depict high and low levels of the moderating variables. Figure 1 presents the moderating effect of politician turnover.

![Figure 1. Moderating effect of politician turnover.](image-url)
Table 1. Descriptive statistics and correlations of dependent variable, independent variable, moderating variable, and control variables.

|     | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| green | 1  |    |    |    |    |    |    |    |    |    |    |    |    |
| depoliticization | 0.016 | 1  |    |    |    |    |    |    |    |    |    |    |    |
| turnover | 0.016 | 0.006 | 1  |    |    |    |    |    |    |    |    |    |    |
| uncertainty | 0.029 ** | 0.194 *** | 0.150 *** | 1  |    |    |    |    |    |    |    |    |    |
| top | −0.006 | −0.105 *** | 0.004 | −0.043 *** | 1  |    |    |    |    |    |    |    |    |
| duality | −0.009 | 0.186 *** | −0.002 | 0.040 *** | −0.042 *** | 1  |    |    |    |    |    |    |    |
| independence | 0.033 ** | 0.009 | −0.008 | 0.011 | 0.042 *** | −0.072 *** | 1  |    |    |    |    |    |    |
| size | 0.156 *** | 0.079 *** | 0.028* | 0.195 *** | 0.084 *** | 0.104 *** | −0.028 * | 1  |    |    |    |    |    |
| slack | −0.043 *** | −0.075 *** | 0.003 | −0.071 *** | 0.123 *** | −0.017 | −0.013 | −0.253 *** | 1  |    |    |    |    |
| roa | 0.011 | −0.064 *** | −0.005 | −0.032 ** | 0.147 *** | −0.002 | 0.038 *** | 0.104 *** | 1  |    |    |    |    |
| competition | −0.01 | −0.029 ** | −0.018 | −0.111 *** | 0.097 *** | 0.041 *** | 0.002 | 0.036 ** | −0.048 *** | −0.048 *** | 1  |    |    |
| listage | −0.028* | 0.162 *** | −0.001 | 0.098 *** | −0.327 *** | 0.091 *** | 0.011 | 0.308 *** | −0.241 *** | −0.099 *** | −0.002 | 1  |    |
| region | 0.023 | −0.038 *** | 0.008 | 0.015 | 0.061 *** | −0.004 | 0.053 *** | −0.002 | 0.015 | 0.013 | 0.019 | −0.176 *** | 1  |
| Mean | 1.343 | 0.358 | 0.31 | 229.196 | 48.346 | 0.551 | 0.377 | 21.767 | 3.03 | 0.043 | 0.432 | 6.966 | 0.714 |
| SD  | 8.423 | 0.479 | 0.462 | 104.955 | 15.4 | 0.497 | 0.056 | 1.188 | 3.785 | 0.089 | 0.19 | 6.281 | 0.452 |

Note: N = 4576, *p < 0.10, **p < 0.05, ***p < 0.01.
Table 2. Baseline regression results.

|             | Coef  | SE  | Z    | Coef     | SE  | Z    | Coef     | SE  | Z    |
|-------------|-------|-----|------|----------|-----|------|----------|-----|------|
| uncertainty | 0.0005*** | 0.0030 | −0.0002 | −3.00 | 0.0007*** | 0.0000 | −0.0002 | −3.99 | 0.0007*** | 0.0000 | −0.0007*** | −4.24 |
| top         | 0.0038 | 0.0010 | −0.0030 | −1.28 | 0.00506*   | 0.0080 | −0.0030 | −1.71 | 0.0032   | −0.2860 | −0.0032   | −1.07 |
| duality     | 0.110*** | 0.0080 | −0.0414 | −2.6700 | 0.0863**  | 0.0340 | −0.0416 | −2.1200 | 0.0865**  | 0.0390 | 0.0863**  | −2.0700 |
| independence| 3.074*** | 0.0000 | −0.3160 | −9.7200 | 3.193***  | 0.0000 | −0.3160 | −10.1000 | 3.391***  | 0.0000 | 3.391***  | −10.5900 |
| size        | 0.161*** | 0.0000 | −0.0392 | −4.1100 | 0.180***  | 0.0000 | −0.0394 | −4.5700 | 0.230***  | 0.0000 | 0.230***  | −5.7600 |
| slack       | 0.0454*** | 0.0000 | −0.0104 | −4.3600 | 0.0460***  | 0.0000 | −0.0105 | −4.4000 | 0.0445***  | 0.0000 | 0.0445***  | −4.2500 |
| roa         | −0.619*** | 0.0070 | −0.2300 | −2.69 | −0.674***  | 0.0050 | −0.2400 | −2.81 | −0.814***  | −0.0101 | −0.814***  | −3.27 |
| competition | −0.946*** | 0.0000 | −0.2680 | −3.53 | −0.956***  | 0.0000 | −0.2670 | −3.58 | −0.749***  | −0.0050 | −0.749***  | −2.80 |
| listage     | 0.115*** | 0.0000 | −0.0126 | −9.1000 | 0.0917***  | 0.0000 | −0.0129 | −7.1100 | 0.0917***  | 0.0000 | 0.0917***  | −7.1100 |
| region      | 0.3510   | −0.1160 | −0.2230 | −1.5700 | 0.3050     | −0.1660 | −0.2200 | −1.3900 | 0.3140     | −0.1510 | 0.3140     | −1.4400 |
| turnover    | 0.0153   | −0.5830 | −0.0278 | −0.5500 | 0.0130     | −0.6410 | −0.0279 | −0.4700 | −0.0312    | −0.2780 | −0.0312    | −1.09 |
| depoliticization | 0.250*** | 0.0000 | −0.0379 | −6.8400 | 0.230***   | 0.0000 | 0.230*** | −6.0000 | 0.494***   | 0.0000 | 0.494***   | −6.6200 |
| depoliticization × turnover | 0.494*** | 0.0000 | 0.494*** | −6.8200 | 0.494***   | 0.0000 | 0.494*** | −6.6600 | 0.494***   | 0.0000 | 0.494***   | −6.6600 |
| constant    | −4.608*** | 0.0000 | −4.907*** | 0.0000 | −6.180***  | 0.0000 | −6.180*** | −6.6600 | 0.494***   | 0.0000 | 0.494***   | −6.6600 |
| lnalpha     | 2.197*** | 0.0000 | 2.168*** | 0.0000 | 2.148***   | 0.0000 | 2.148*** | −32.0000 | 2.148***   | 0.0000 | 2.148***   | −32.0000 |
| observations | 4576     | 4576   | 4576   | 4576     | 4576      | 4576   | 4576     | 4576     | 4576       | 4576   | 4576       | 4576   |

Note: Coef is coefficient, p indicates the significance, * p < 0.10, ** p < 0.05, *** p < 0.01, Standard errors is SE, Z statistics is Z.
The source of Figure 1 is the results of moderating effect of politician turnover. Figure 1 shows that if depoliticized firms have experienced politician turnover, the relationship between corporate depoliticization and green innovation is more positive, whereas if the politicians are not turned over, the focal relationship becomes less positive. This result is consistent with H1 that politician turnover positively moderates the relationship between corporate depoliticization and green innovation.

Figure 1 shows that politician turnover moderates the effect of corporate depoliticization and green innovation. Depoliticization refers to corporate depoliticization, and non-depoliticization is opposite side of depoliticization. Turnover is politician turnover and non-turnover is opposed side.

4.3. Robustness Test

The source of Table 3 is the results of robustness regression model. In Table 3, we adopted alternative measurements of control variables for our robustness test. We used share percentage of the top five shareholders of the firm to measure ownership concentration, and we adopted the square of Herfindahl-Hirschman index of the top four largest firms’ sales in industry i to measure industrial competition. Model 5 reports the result of the effect of corporate depoliticization on green innovation, and we can find corporate depoliticization positively and significantly affect green innovation. Model 6 reports the result of the moderating effect of politician turnover on the above relationship, and we can find that the coefficient and significant level of all models are similar with Table 2.

In more detail, Table 3 reports the alternative measurements of control variables for our robustness test. Model 4 reports the result of regression of dependent variable, moderating variable and alternative control variables; Model 5 reports the result of regression of dependent variable, independent variable, moderating variable, and alternative control variables; Model 6 reports the result of regression of dependent variable, independent variable, moderating variable, interaction of independent variable and moderating variable, and alternative control variables. Model 5 and Model 6 report robustness of the main effect and moderating effect.

4.4. PSM Test

The source of Table 4 is the results of PSM model. To check whether our results have any potential sample selection issues, we conducted a propensity score matching (PSM) test [66]. This is because our dependent variable is corporate depoliticization and sample selection bias may affect our empirical results. Thus, PSM is introduced to address this concern. Table 4 presents the results of logit regression for PSM test; we selected a series of covariates in this model.

Here, the treatment variable is corporate depoliticization, and the covariate variables are all control variables, including politician turnover, economic uncertainty, ownership concentration, CEO duality, board independence, firm size, firm slack, firm performance, market competition, firm list age, and region.

Table 5 presents the results of the balance test before the PSM test and these suggest that the standard deviation bias of all variables after matching is less than 10%, and all t-test results passed. The result shows that the covariate variables have passed the balance test and that the problem caused by sample selection bias can be reduced after propensity matching.

In Table 5, the treatment variable is corporate depoliticization. The covariate variables are all control variables, which include politician turnover, economic uncertainty, ownership concentration, CEO duality, board independence, firm size, firm slack, firm performance, market competition, firm list age, and region.

The source of Table 6 is the results of robustness test model for matched samples. We identified the matched samples, and we then reran all models for the matched samples to examine our hypotheses. Table 6 shows that the results from the PSM method are consistent with Table 2, which means that the results have robustness after we mitigated the endogeneity concerns.
Table 3. Robustness test.

|                  | Model 4       |          |          | Model 5       |          |          | Model 6       |          |          |
|------------------|---------------|----------|----------|---------------|----------|----------|---------------|----------|----------|
|                  | Coef          | p        | SE       | Z             | Coef     | p        | SE       | Z             | Coef     | p        | SE       | Z             |
| uncertainty      | −0.000455 *** | −0.013   | 0.000    | −2.480        | −0.000630 *** | −0.001 | 0.000    | −3.410        | −0.000709 *** | 0.000 | 0.000    | −3.830 |
| top              | −0.002        | −0.586   | −0.003   | −0.550        | −0.002    | −0.465   | −0.003   | −0.730        | 0.001    | −0.796 | −0.003   | −0.260 |
| duality          | 0.0824 *      | −0.056   | −0.043   | −1.910        | 0.056     | −0.196   | −0.044   | −1.290        | 0.054    | −0.214 | −0.044   | −1.240 |
| independence     | 3.201 ***     | 0.000    | −0.323   | −9.920        | 3.324 *** | 0.000    | −0.322   | −10.320       | 3.572 *** | 0.000 | −0.327   | −10.920 |
| size             | 0.117 ***     | −0.003   | −0.040   | −2.960        | 0.137 *** | −0.001   | −0.040   | −3.430        | 0.190 *** | 0.000 | −0.041   | −4.710 |
| slack            | 0.0463 ***    | 0.000    | −0.011   | −4.300        | 0.0465 *** | 0.000    | −0.011   | −4.300        | 0.0448 *** | 0.000 | −0.011   | −4.130 |
| roa              | −0.597 ***    | −0.009   | −0.228   | −2.630        | −0.654 *** | −0.006   | −0.239   | −2.740        | −0.843 *** | −0.001 | −0.250   | −3.370 |
| competition      | −1.189 **     | −0.029   | −0.545   | −2.180        | −1.303 ** | −0.016   | −0.539   | −2.410        | −0.979 *  | −0.069 | −0.539   | −1.820 |
| listage          | 0.132 ***     | 0.000    | −0.013   | −10.230       | 0.108 *** | 0.000    | −0.013   | −8.180        | 0.108 *** | 0.000 | −0.013   | −8.180 |
| region           | 0.383 *       | −0.092   | −0.227   | −1.680        | 0.324     | −0.148   | −0.224   | −1.450        | 0.327    | −0.140 | −0.222   | −1.470 |
| turnover         | 0.011         | −0.697   | −0.028   | −0.390        | 0.011     | −0.688   | −0.028   | −0.400        | −0.038    | −0.202 | −0.029   | −1.270 |
| depoliticization | 0.267 ***     | 0.000    | −0.039   | −6.940        | 0.237 *** | 0.000    | −0.039   | −6.110        | 0.237 *** | 0.000 | −0.058   | −8.890 |
| depoliticization × turnover | 0.512 *** | 0.000 | −0.058 | −2.840 |
| constant         | −4.172 ***    | 0.000    | −0.917   | −4.550        | −4.518 *** | 0.000    | −0.918   | −4.920        | −5.874 *** | 0.000 | −0.932   | −6.310 |
| lnalpha          | 2.221 ***     | 0.000    | −0.067   | −33.000       | 2.190 *** | 0.000    | −0.068   | −32.360       | 2.170 *** | 0.000 | −0.068   | −32.110 |
| observations     | 4539          | 4539     | 4539     | 4539          | 4539     | 4539     | 4539     | 4539          | 4539     | 4539     | 4539     |

Note: coef is coefficient, $p$ indicates the significance, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, Standard errors is SE, Z statistics is Z.
Table 4. Results for matched regression.

| Depoliticization | Coef.  | SE     | Z      | $p > z$ | [95% Conf. Interval] |
|------------------|--------|--------|--------|---------|----------------------|
| turnover         | −0.1002| 0.0693 | −1.4500| 0.1480  | −0.2361  | 0.0356 |
| uncertainty      | 0.0037 | 0.0003 | 11.7700| 0.0000  | 0.0031   | 0.0043 |
| top              | −0.0069| 0.0023 | −3.0500| 0.0020  | −0.0113  | −0.0025|
| duality          | 0.7792 | 0.0655 | 11.9000| 0.0000  | 0.6508   | 0.9075 |
| independence     | 0.8540 | 0.5682 | 1.5000 | 0.1330  | 0.6508   | 0.2041 |
| size             | −0.0112| 0.0294 | −0.3800| 0.7040  | −0.0689  | 0.0465 |
| slack            | −0.0227| 0.0107 | −2.1300| 0.0330  | −0.0436  | −0.0018|
| roa              | −1.0173| 0.4149 | −2.4500| 0.0140  | −1.8305  | −0.2041|
| competition      | −0.2059| 0.1705 | −1.2100| 0.2270  | −0.5400  | 0.1282 |
| listage          | 0.0345 | 0.0057 | 6.0400 | 0.0000  | 0.0233   | 0.0457 |
| region cons      | −0.0976| 0.0708 | −1.3800| 0.1680  | −0.2363  | 0.0411 |

Log likelihood: −2899.3662
Number of obs: 4796.0000
LR chi²(11): 457.7700
Prob > chi²: 0.0000
Pseudo R²: 0.0732

Table 5. Results of balance test.

| Variable   | Unmatched Mean | %Reduct | t-Test | $p > t$ |
|------------|----------------|---------|--------|--------|
| turnover   | Matched        | Treated | Control| Bias   | Bias   | t      | $p > t$ |
| U          | 0.31552        | 0.31229 | 0.7    | 0.21   | 0.835  |
| M          | 0.31552        | 0.31314 | 0.5    | 0.15   | 0.883  |
| uncertainty| Matched        | Treated | Control| Bias   | Bias   | t      | $p > t$ |
| U          | 0.65871        | 0.58003 | 16.3   | 4.85   | 0      |
| M          | 0.65871        | 0.67463 | −3.3   | 79.8   | −0.97  | 0.332  |
| top        | Matched        | Treated | Control| Bias   | Bias   | t      | $p > t$ |
| U          | 46.624         | 47.952  | −8.8   | −2.61  | 0.009  |
| M          | 46.624         | 46.101  | 3.4    | 60.6   | 0.99   | 0.32   |
| independence| Matched      | Treated | Control| Bias   | Bias   | t      | $p > t$ |
| U          | 0.37783        | 0.37862 | −1.4   | −0.41  | 0.678  |
| M          | 0.37783        | 0.3794  | −2.8   | −99.7  | −0.79  | 0.427  |
| size       | Matched        | Treated | Control| Bias   | Bias   | t      | $p > t$ |
| U          | 21.868         | 21.792  | 6.3    | 1.88   | 0.061  |
| M          | 21.868         | 21.901  | −2.7   | 56.7   | −0.72  | 0.472  |
| slack      | Matched        | Treated | Control| Bias   | Bias   | t      | $p > t$ |
| U          | 2.6862         | 2.79    | −3.5   | −1.05  | 0.293  |
| M          | 2.6862         | 2.5596  | 4.3    | −22    | 1.32   | 0.186  |
| roa        | Matched        | Treated | Control| Bias   | Bias   | t      | $p > t$ |
| U          | 0.03568        | 0.0425  | −9.7   | −2.91  | 0.004  |
| M          | 0.03568        | 0.03833 | −3.7   | 61.2   | −1.09  | 0.274  |
| competition| Matched       | Treated | Control| Bias   | Bias   | t      | $p > t$ |
| U          | 0.42898        | 0.42982 | −0.4   | −0.13  | 0.893  |
| M          | 0.42898        | 0.42272 | 3.4    | −647.8 | 0.97   | 0.33   |
| listage    | Matched        | Treated | Control| Bias   | Bias   | t      | $p > t$ |
| U          | 8.1728         | 7.0548  | 17.7   | 5.28   | 0      |
| M          | 8.1728         | 8.1629  | 0.2    | 99.1   | 0.04   | 0.965  |
| region     | Matched        | Treated | Control| Bias   | Bias   | t      | $p > t$ |
| U          | 0.69642        | 0.7161  | −4.3   | −1.29  | 0.196  |
| M          | 0.69642        | 0.69229 | 0.9    | 79     | 0.26   | 0.797  |

In more detail, Table 6 is robustness test model in matched samples. Model 7 reports the result of regression of dependent variable, moderating variable and control variables; Model 8 reports the result of regression of dependent variable, independent variable, moderating variable and control variables, and it is the main effect test; Model 9 reports the result of regression of dependent variable, independent variable, moderating variable, interaction of independent variable and moderating variable and control variables, and it is the moderating effect test.
Table 6. Regressions of matched samples.

|                | Model 7 |           |           |           | Model 8 |           |           |           | Model 9 |           |           |           |
|----------------|---------|-----------|-----------|-----------|---------|-----------|-----------|-----------|---------|-----------|-----------|-----------|
|                | Coef    | p         | SE        | Z         | Coef    | p         | SE        | Z         | Coef    | p         | SE        | Z         |
| uncertainty    | −0.00138*** | 0.000   | 0.000     | −5.800    | −0.00128*** | 0.000   | 0.000     | −5.510    | −0.00130*** | 0.000   | −5.410    | −5.100    |
| top            | −0.00339   | −0.344  | −0.00358  | −0.95     | −0.00323   | −0.363  | −0.00335  | −0.576    | −0.00199   | −0.91    | −0.56     | −0.56     |
| duality        | 0.143***   | −0.007  | −0.0535   | −2.68     | 0.150***   | −0.005  | −0.0537   | −2.8      | 0.136**    | −0.012   | −2.8      | −2.52     |
| independence   | 2.424***   | 0.000   | −0.343    | −7.06     | 2.836***   | 0.000   | −0.35     | −3.57     | 3.152***   | 0.000   | −8.1      | −8.82     |
| slack          | 0.134***   | −0.004  | −0.0465   | −2.88     | 0.147***   | −0.002  | −0.0471   | −0.473    | 0.183***   | 0.000   | −3.13     | −3.87     |
| roa            | 0.0397**   | −0.014  | −0.0162   | −2.45     | 0.0400**   | −0.015  | −0.0164   | −0.164    | 0.0383**   | −0.019   | −2.44     | −2.34     |
| size           | −0.630**   | −0.025  | −0.281    | −2.24     | −0.604**   | −0.037  | −0.29     | −0.304    | −0.772**   | −0.011   | −2.08     | −2.54     |
| competition    | −0.694**   | −0.047  | −0.349    | −1.99     | −0.731**   | −0.034  | −0.345    | −0.345    | −0.606*    | −0.079   | −2.12     | −1.76     |
| listage        | 0.135***   | 0.000   | −0.0151   | −8.95     | 0.102***   | 0.000   | −0.0155   | −0.154    | 0.100***   | 0.000   | −6.6      | −6.5      |
| region         | 0.339      | −0.164  | −0.244    | −1.39     | 0.257      | −0.280  | −0.238    | −0.235    | 0.264      | −0.262   | −1.08     | −1.12     |
| turnover       | 0.121***   | 0.000   | −0.0344   | −3.51     | 0.113***   | −0.001  | −0.0343   | −0.0386   | 0.002      | −0.959   | −3.29     | −0.05     |
| depoliticization | 0.352***  | 0.000   | −0.0486   | −0.487    | 0.342***   | 0.000   | −7.24     | −7.01     |
| depoliticization × turnover | −0.0702 | 0.473*** | 0.000     | −6.74     |
| constant       | −3.719***  | 0.000   | −1.068    | −3.48     | −4.166***  | 0.000   | −1.075    | −1.08     | −5.034***  | 0.000   | −3.88     | −4.66     |
| lnalpha        | 2.296***   | 0.000   | −0.0723   | −31.76    | 2.247***   | 0.000   | −0.0729   | −0.0728   | 2.227***   | 0.000   | −30.85    | −30.6     |
| observations   | 3634      | 3634     | 3634      | 3634      | 3634      | 3634     | 3634      | 3634      | 3634      | 3634     | 3634      | 3634      |

Note: coef is coefficient, p indicates the significance, * p < 0.10, ** p < 0.05, *** p < 0.01, Standard errors is SE, Z statistics is Z.
4.5. Heckman Two-Stage Model Analysis

The source of Table 7 is the results of the Heckman two-stage model. To check whether our results have any potential omitted sample issues, we conducted tests by a Heckman two-stage model and the results are shown in Table 7. Panel A is the results of the probit regression for the first stage of the Heckman test and Panel B is the second stage of the Heckman test. The first stage was conducted to obtain the variable of ‘Inverse Mill Ratio (mills)” [67]. In the first stage, we controlled for a series of covariates, including ownership concentration, firm leverage, firm age, region, economic uncertainty, and state ownership. We then reran all models by controlling the mills in the second stage.

Table 7 reports the results of Heckman first step. The dependent variable is the dummy variable of dependent variable, and the control variables include CEO duality, board independence, firm size, firm growth, firm performance, and firm list age.

Table 7. Results of Heckman two-stage model: Heckman first step.

| DV = CER Dummy | Duality | Independence | Size | Growth | Roa | Listage | Cons |
|----------------|---------|--------------|------|--------|-----|---------|------|
| Coef.          | 0.0686  | –0.4128      | 0.3009 | –0.0425 | –0.3451 | –0.0626 | –6.8796 |
| Std. Err.      | 0.0435  | 0.3933       | 0.0217 | 0.0199 | 0.3128 | 0.0045 | 0.4900 |
| Z              | 1.58    | –1.05        | 13.82 | –2.13  | –1.1  | –13.82 | –14.04 |
| p > z          | 0.115   | 0.294        | 0     | 0.033  | 0.27  | 0       | 0     |

The results of Table 8 show that the significance level of all coefficients remained consistent with those in Table 2 and the mills are significant, which means that we might successfully control the sample’s omitted bias.

Table 8 is the Heckman second step by controlling the mills in our model. Model 11 reports the result of regression of dependent variable, moderating variable, mills and control variables; Model 12 reports the result of regression of dependent variable, independent variable, moderating variable, mills and control variables, and it is the main effect test; Model 13 reports the result of regression of dependent variable, independent variable, moderating variable, interaction of independent variable and moderating variable, mills and control variables, and it is the moderating effect test.

4.6. DID Model Analysis

The source of Table 9 is the results of the DID model. The anticorruption shocks may trigger firms’ depoliticization. We considered this exogenous event and adopted the DID model to compare the difference in firms’ green innovation before and after the anticorruption shocks. Table 9 reports the DID regressions. The results suggest that the DID interaction variable (the interaction of corporate depoliticization and anticorruption shocks) is positive and significant, which means that anticorruption shocks can positively and significantly impact the implementation of green innovation.

More specifically, Table 9 reports the effect of corporate depoliticization on green innovation by using the DID model. Model 14 reports the result of regression of dependent variable, moderating variable and control variables; Model 15 reports the result of regression of dependent variable, independent variable (the interaction of corporate depoliticization and anticorruption shocks), moderating variable and control variables, and it is the main effect test; Model 16 reports the result of regression of dependent variable, independent variable (the interaction of corporate depoliticization and anticorruption shocks), moderating variable, interaction of independent variable and moderating variable, and control variables, and it is the moderating effect test.
Table 8. Results of Heckman two-stage model: Heckman second step.

|            | Model 1 |           | Model 2 |           | Model 3 |           |
|------------|---------|-----------|---------|-----------|---------|-----------|
|            | Coef    | p         | SE      | Z         | Coef    | p         | SE      | Z         | Coef    | p         | SE      | Z         |
| uncertainty| 0.000583 | 0.001     | -0.00183| -3.18     | 0.000781 | 0.000     | -0.00185| -4.22     | 0.000825 | 0.000     | -0.00185| -4.45     |
| top        | -0.00363| 0.223     | -0.00297| -1.22     | -0.00485| 0.102     | -0.00296| -1.64     | -0.003    | 0.314     | -0.00298| -1.01     |
| duality    | 0.0201  | -0.715    | -0.0549 | -0.37     | -0.0247 | -0.663    | -0.0568 | -0.44     | -0.0201  | -0.726    | -0.0572 | -0.35     |
| independence| 3.578   | 0.000     | -0.375 | -9.53     | 3.827    | 0.000     | -0.384 | -9.97     | 3.992    | 0.000     | -0.39  | -10.25    |
| size       | -0.209  | -0.171    | -0.153 | -1.37     | -0.282  | -0.083    | -0.162 | -1.73     | -0.204   | -0.213    | -0.164 | -1.25     |
| slack      | 0.0445  | 0.000     | -0.0104| -4.26     | 0.0449  | 0.000     | -0.0105| -4.28     | 0.0434   | 0.000     | -0.0105| -4.13     |
| roa        | -0.104  | -0.735    | -0.307 | -0.34     | -0.0372 | -0.908    | -0.322 | -0.12     | -0.217   | -0.511    | -0.33  | -0.66     |
| competition| -0.894  | 0.001     | -0.27  | -3.31     | -0.891  | 0.001     | -0.269 | -3.31     | -0.689   | 0.011     | -0.27  | -2.55     |
| listage    | 0.197   | 0.000     | -0.355 | -5.58     | 0.194   | 0.000     | -0.373 | -5.21     | 0.188    | 0.000     | -0.376 | -5        |
| region     | 0.369   | -0.100    | -0.224 | -1.64     | 0.322   | -0.146    | -0.221 | -1.46     | 0.324    | -0.139    | -0.219 | -1.48     |
| mills      | -1.622  | -0.012    | -0.648 | -2.5      | -2.022  | -0.003    | -0.691 | -2.93     | -1.899   | -0.006    | -0.698 | -2.72     |
| turnover   | 0.0165  | -0.553    | -0.027 | -0.59     | 0.0145  | -0.603    | -0.027 | -0.52     | -0.0295  | -0.305    | -0.0288| -1.03     |
| depoliticization | 0.269 | 0.000     | -0.038 | -7.06     | 0.239   | 0.000     | -0.038 | -6.22     | 0.489    | 0.000     | -0.0573| -8.54     |
| depoliticization × turnover | 0.489 | 0.000     | -0.0573| -8.54     | 0.489   | 0.000     | -0.0573| -8.54     | 0.489    | 0.000     | -0.0573| -8.54     |
| constant   | 5.078   | -0.201    | -3.974 | -1.28     | 7.169   | -0.090    | -4.222 | -1.7      | 5.184    | -0.225    | -4.269 | -1.21     |
| lnalpha    | 2.204   | 0.000     | -0.0671| -32.85    | 2.176   | 0.000     | -0.0674| -32.27    | 2.155    | 0.000     | -0.0673| -32.01    |
| observations| 4576   | 4576     | 4576   | 4576     | 4576   | 4576     | 4576   | 4576     | 4576   | 4576     | 4576   | 4576     |

Note: coef is coefficient, p indicates the significance, * p < 0.10, ** p < 0.05, *** p < 0.01, Standard errors is SE, Z statistics is Z.
Table 9. Results of the DID model.

| Factor                  | Model 14 | Model 15 | Model 16 | Model 17 | Model 18 |
|-------------------------|----------|----------|----------|----------|----------|
| Coef | p     | SE    | Z       | Coef | p     | SE    | Z       | Coef | p     | SE    | Z       | Coef | p     | SE    | Z       |
| uncertainty            | −0.000549 *** | −0.003 | −0.000183 | (−3.00) | −0.000851 *** | 0.000 | −0.000188 | (−4.53) | −0.000870 *** | 0.000 | −0.000188 | (−4.62) |
| top                     | −0.0038   | −0.201 | −0.00297  | (−1.28) | −0.00465   | −0.116 | −0.00296  | (−1.57) | −0.00283   | −0.343 | −0.00298  | (−0.95) |
| duality                 | 0.110 *** | −0.008 | −0.0414   | −2.67  | 0.0848     | −0.041 | −0.0415   | −2.04  | 0.0893 ** | −0.032 | −0.0415   | −2.15  |
| independence            | 3.074 *** | 0.000  | −0.316    | −9.72  | 3.170 ***  | 0.000  | −0.315    | −10.06 | 3.226 *** | 0.000  | −0.318    | −10.14 |
| size                    | 0.161 *** | 0.000  | −0.0392   | −4.11  | 0.174 ***  | 0.000  | −0.0394   | −4.42  | 0.219 ***  | 0.000  | −0.0399   | −5.48  |
| slack                   | 0.0454 ***| 0.000  | −0.0104   | −4.36  | 0.0452 *** | 0.000  | −0.0104   | −4.34  | 0.0436 *** | 0.000  | −0.0104   | −4.19  |
| roa                     | −0.619 ***| −0.007 | −0.23     | (−2.69) | −0.678 *** | −0.005 | −0.241    | (−2.81) | −0.798 *** | −0.001 | −0.248    | (−3.22) |
| competition             | −0.946 ***| 0.000  | −0.268    | (−3.53) | −0.988 *** | 0.000  | −0.267    | (−3.70) | −0.830 *** | −0.002 | −0.268    | (−3.10) |
| listage                 | 0.115 *** | 0.000  | −0.0126   | −9.1   | 0.105 ***  | 0.000  | −0.0126   | −8.35  | 0.102 ***  | 0.000  | −0.0126   | −8.13  |
| region                  | 0.351     | −0.116 | −0.223    | −1.57  | 0.309      | −0.166 | −0.223    | −1.39  | 0.312      | −0.158 | −0.22     | −1.41  |
| turnover                | 0.0153    | −0.583 | −0.0278   | −0.55  | 0.0136     | −0.626 | −0.0279   | −0.49  | −0.0406    | −0.166 | −0.0293   | −1.39  |
| depoliticization × 2013 | 0.263 *** | 0.000  | −0.0389   | −6.76  | 0.239 ***  | 0.000  | −0.0393   | −6.1   | 0.444 ***  | 0.000  | −0.0623   | −7.13  |
| depoliticization × 2013 | 4.608 *** | 0.000  | −0.915    | (−5.04) | 4.698 ***  | 0.000  | −0.917    | (−5.12) | 5.872 ***  | 0.000  | −0.93     | (−6.32) |
| lnalpha                 | 2.197 *** | 0.000  | −0.0669   | −32.84 | 2.187 ***  | 0.000  | −0.0669   | −32.69 | 2.165 ***  | 0.000  | −0.0669   | −32.35 |
| observations            | 4576      | 4576    | 4576      | 4576    | 4576      | 4576    | 4576      | 4576    | 4576      | 4576    | 4576      | 4576    |

Note: coef is coefficient, p indicates the significance, ** p < 0.05, *** p < 0.01, Standard errors is SE, Z statistics is Z.
4.7. Further Analysis

Given that environmental legislation and regulation may stimulate green innovation, which tends to affect the empirical results of the depoliticization-green innovation relationship. Therefore, this paper added these factors in our research model to mitigate such issues on our finding. Following the study of Ren et al. [23], we first added environmental regulation in baseline model, and we reran all regression models. The measurement of environmental regulation is based on the approach of Li et al. [1] and Aiken and Pasurka [68], which adopted Sulphur dioxide removal rate to measure it. The results are shown in Table 10 and indicate that corporate depoliticization still has a significant and positive effect on green innovation after we controlled the factor of environmental regulations.

Table 10 reports the results of controlling other factors in research model. Model 17 reports the result of regression of dependent variable, moderating variable, environmental regulation and control variables; Model 18 reports the result of regression of dependent variable, independent variable, moderating variable, environmental regulation and control variables, and it is the main effect test; Model 19 reports the result of regression of dependent variable, independent variable, moderating variable, interaction of independent variable and moderating variable, environmental regulation and control variables, and it is the moderating effect test.
Table 10. Further Analysis.

|                   | Coef         | p         | SE         | Z         | Coef         | p         | SE         | Z         | Coef         | p         | SE         | Z         |
|-------------------|--------------|-----------|------------|-----------|--------------|-----------|------------|-----------|--------------|-----------|------------|-----------|
| uncertainty       | -0.000386 ** | -0.035    | -0.00183   | -2.11     | -0.000578 ***| -0.002    | -0.000184 | -3.41     | -0.000630 ***| -0.001    | -0.000185 | -3.41     |
| top               | -0.00321     | -0.285    | -0.003     | -1.07     | -0.00446     | -0.136    | -0.00299   | -0.88     | -0.00266     | -0.378    | -0.00301   | -0.88     |
| duality           | 0.118 ***    | -0.004    | -0.0416    | -2.84     | 0.0955 **    | -0.023    | -0.0419    | -2.13     | 0.0895 **    | -0.033    | -0.042     | -2.13     |
| independence      | 2.876 ***    | 0.000     | -0.322     | -8.92     | 3.009 ***    | 0.000     | -0.322     | -9.87     | 3.217 ***    | 0.000     | -0.326     | -9.87     |
| size              | 0.165 ***    | 0.000     | -0.0394    | -4.19     | 0.183 ***    | 0.000     | -0.0396    | -5.79     | 0.232 ***    | 0.000     | -0.0401    | -5.79     |
| slack             | 0.0500 ***   | 0.000     | -0.0107    | -4.69     | 0.0510 ***   | 0.000     | -0.0107    | -4.6      | 0.0496***    | 0.000     | -0.0108    | -4.6      |
| roa               | -0.564 **    | -0.013    | -0.227     | -2.48     | -0.615 ***   | -0.009    | -0.236     | -3.06     | -0.751 ***   | -0.002    | -0.245     | -3.06     |
| competition       | -0.987 ***   | 0.000     | -0.273     | -3.61     | -0.981 ***   | 0.000     | -0.272     | -2.85     | -0.776 ***   | -0.004    | -0.273     | -2.85     |
| listage           | 0.0881 ***   | 0.000     | -0.0129    | -6.83     | 0.0659 ***   | 0.000     | -0.0131    | -5.07     | 0.0661 ***   | 0.000     | -0.013     | -5.07     |
| region            | 0.34         | -0.120    | -0.219     | -1.55     | 0.296         | -0.170    | -0.216     | -1.43     | 0.306        | -0.153    | -0.214     | -1.43     |
| regulation        | -0.332 ***   | 0.000     | -0.0508    | -6.54     | -0.333 ***   | 0.000     | -0.0504    | -6.61     | -0.332 ***   | 0.000     | -0.0502    | -6.61     |
| turnover          | 0.0184       | -0.509    | -0.0278    | -0.66     | 0.016         | -0.564    | -0.0278    | -0.97     | -0.028       | -0.331    | -0.0288    | -0.97     |
| depoliticization  | 0.261 ***    | 0.000     | -0.0378    | -6.05     | 0.231 ***    | 0.000     | -0.0382    | -6.05     | 0.231 ***    | 0.000     | -0.0382    | -6.05     |
| depoliticization ×turnover | -4.586 *** | 0.000 | -0.914 | -5.02 | -4.871 *** | 0.000 | -0.914 | -6.62 | -6.129 *** | 0.000 | -0.926 | -6.62 |
| lnalpha           | 2.146 ***    | 0.000     | -0.0674    | -31.83    | 2.120 ***    | 0.000     | -0.0675    | -31.11    | 2.099 ***    | 0.000     | -0.0675    | -31.11    |
| observations      | 4576         | 4576      | 4576       | 4576      | 4576         | 4576      | 4576       | 4576      | 4576         | 4576      | 4576       | 4576      |

Note: coef is coefficient, p indicates the significance, **p < 0.05, ***p < 0.01, Standard errors is SE, Z statistics is Z.
5. Conclusions

With a dataset of privately operated Chinese firms from 2008 to 2017, our results show that corporate depoliticization is positively related with green innovation. This work further found that this positive relationship was moderated by politician turnover, such that the depoliticized effect was more pronounced when the firm confronted the turnover of politicians.

First, our study explained that depoliticization can provoke firms’ green innovation. Prior research mainly explores the influence of political connection on firm outcomes and provided inconsistent conclusions. Some researchers argued that political connections offer firms access to critical resource [69,70]; others contended that political connections bring government contracts for firm so that firm can survive in lowly innovation [12,13]. We examined the relationship between corporate depoliticization and green innovation. We found that corporate depoliticization may stimulate green innovation.

Second, our finding shows that the positive effect was moderated by politician turnover. Politician turnover can strengthen the positive relationship between corporate depoliticization and green innovation in such a way that the green innovation effect of depoliticized firms in the situation of the turnover of politicians was more pronounced. Furthermore, anticorruption shocks had a significant and positive effect on green innovation when interacted with a firm with depoliticization.

There are some limitations in this paper that are worthy of further research in the future. First, due to data availability, we only examined the depoliticized effect on green innovation. Future research can consider more comprehensively the impact of different types of depoliticization, such as sudden death, on firm strategies. Second, we only considered the turnover of politicians as a moderating mechanism; other moderating and mediating factors should be taken into consideration in further studies.

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