

# Research on the Intermediary Effect of Enterprise Political Relevance between Institutional Environment and Innovation Quality

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**Abstract:** Using the data of China's manufacturing industry listed firms, this paper empirically explores the intermediary effect of political relevance between institutional environment and innovation quality. The results show that mediation effect of political connection on the "institutional dividend effects" is nonlinear. For details, in the relatively poor institutional environment, the political connection can strengthen the "institutional dividend effects", while weaken it in the relatively developed institutional environment, which means the firms' strategy of political connection is not long-term sustainable. Our findings can provide some evidences for the government's policy design and firms' strategy formulation.

## 1. Introduction

Research on how to promote enterprise innovation has long been one of the hot topics of academic attention. According to different research contents, we divide the relevant literature on the relationship between institutional environment and enterprise innovation into two categories: one is the impact of the institutional environment on the innovation decision-making of enterprises, and the other is the influence of the institutional environment on the results of enterprise innovation.

First, research on the impact of the institutional environment on enterprise innovation decision-making. The institutional environment can significantly affect the after-the-fact "economic rent" of the innovation results of enterprises [1,2], so that differences in the institutional environment, especially the degree of perfection of the property rights system, will change the innovation strategy choice of enterprises. Moser [3] and Png [4] argue that intellectual property protection can promote the diffusion of technological innovation, thereby raising the overall level of innovation in society. However, some scholars hold different views, such as Gangopadhyay et al. [5] arguing that too tight or too loose intellectual property protection systems may be detrimental to the R&D and innovation investment of developing country enterprises, and there is an inverted U-shaped relationship between the two; Park [6] holds a similar view, arguing that there is "optimal intellectual property protection" in the process of corporate innovation.

Second, on the impact of the institutional environment on the results of enterprise innovation. Belloc [7] argues that differences in the institutional environment faced by firms explain to some extent the differences in innovation output between regions. Sapra et al. [8] analyzed the impact on innovation output from the level of the external legal system of corporate governance; Gao Jie et al. [9] believe that the development of the regional legal system environment is conducive to promoting the growth of enterprise patent output; Xiong Kaijun [10] and Lin Zhouyu [11] believe that with the increase of the degree of protection of investors by the state and the improvement of the business environment, it can effectively enhance the output of enterprise innovation.

A large number of documents have shown that political associations play an important role in the growth process of Chinese enterprises, so the question that needs to be considered is whether political associations have an intermediary regulatory effect on the aforementioned "institutional dividend" effect. That is, will companies change the impact of the institutional environment on their innovation motivation because they choose political connections? Looking at the existing relevant research, it mainly focuses on the impact of political ties on corporate growth and corporate innovation, and cannot effectively answer the above questions. In view of this, this paper intends to continue to deepen from

the perspective of political association, and explore the mediating and regulating effect of political association on the “institutional dividend” effect, which will provide strong theoretical support for the formulation of relevant strategic decisions of Chinese enterprises.

## 2. Model design

In order to estimate the effect of mediation moderation more objectively, we use the test procedure for the effect of mediation proposed by Baron et al. [12] and Wen Zhonglin et al. [13]. The whole test procedure can be divided into three stages: the first stage, taking the vertical innovation motivation (*patent\_i*) of the enterprise as the interpreted variable, the regression coefficient  $a_1$  of the institutional variable is obtained, if  $a_1$  is not significant, the entire test procedure is terminated, and vice versa, the next stage is continued; In the second stage, the political correlation of the mediating regulatory variable is used as the interpreted variable, and the coefficient of the obtained institutional variable is  $a_2$ ; In the third stage, the political correlation of the mediating regulator variable is added to the estimation model of the first stage, at which time the regression coefficient  $a_3$  of the institutional variable and the regression coefficient of the political correlation variable  $b$  are obtained.

If the coefficients  $a_2$  and  $b$  are both significant, and the coefficient  $a_3$  is also significant, it indicates that political associations have a non-fully mediating moderating effect in the “institutional dividend” effect; If the coefficient  $a_3$  is not significant, it indicates a completely mediated regulatory effect. However, if one of the coefficients  $a_2$  or  $b$  is not significant, a Sobel test is required based on the estimation proposed by Sobel, which means that there is a mediating effect on political associations, and vice versa.

The first stage model described as follows:

$$patent\_i_{it} = \_cons + a_1sys_{it} + \beta controls_{it} + \varepsilon_{it} \quad (1)$$

Many literature studies have shown that there are differences in the needs of enterprises in different institutional environments, and there may be a non-linear relationship between the two, that is, when the institutional environment is weak, enterprises establish political associations and seek more needs for political resources or asylum, and conversely, when the institutional environment is better, the demand of enterprises may be reduced. In view of this, when we build the second-stage model, we introduce the quadratic term of the institutional environment, the specific model is:

$$political_{it} = \_cons + a_{2-1}sys_{it} + a_{2-2}sys_{it}^2 + \beta controls_{it} + \varepsilon_{it} \quad (2)$$

The third stage model is:

$$patent\_i_{it} = \_cons + a_3sys_{it} + bpolitical_{it} + \beta controls_{it} + \varepsilon_{it} \quad (3)$$

Since the second stage model is interpreted as a variable of 0-1, the Probit method is used for estimation, and in order to ensure the robustness of the results, the historical system is selected as the tool variable, and the two-step estimator proposed by Newey is used for solution.

The key explanatory variable *sys* indicates the institutional environment assessment value of the region where the enterprise is located, which is consistent with the practice of most literature and is measured by the “market-oriented index” proposed by Fan Gang. The political association of enterprises, When the resume of the chairman or CEO of the enterprise contains “government”, “people’s congress”, “CPPCC” or “provincial/municipal party committee/county committee/district committee/town committee”, etc., it is considered that the enterprise has political connections, and it is recorded that the company is politically linked, and if it is not, it is recorded as *legal* = 1, and vice versa, it is recorded as *political* = 0.

Consistent with the existing literature practice, the model also controls other variables that may affect the innovative behavior of enterprises, including: (1) the size of the enterprise, measured in the logarithm of total assets, recorded as *size*; (2) the age of the enterprise, calculated based on the year of establishment of the enterprise, and used a logarithmic treatment, recorded as *age*; (3) the net operating cash flow of the enterprise, recorded as *cf*; (4) the enterprise asset-liability ratio, recorded as *lev*; (5)

the current ratio of the enterprise, (6) Retained earnings of enterprises, which are treated logarithmically, are recorded as retained; (7) the return on assets of the enterprise is recorded as roa; (8) the income tax rate of the enterprise is recorded as tax.

### 3. Empirical Analysis

Table 1 reports the results of the test of political relevance in the mediation of “institutional dividends”. From the regression results in column (2) of Table 1, it can be seen that there is a significant inverted U-shaped relationship between the institutional environment and political associations, and the regression results of column (3) show that the political correlation coefficient is significantly positive, which means that political associations have a significant non-complete mediating regulatory effect in the aforementioned “institutional dividend” effect, and this role is non-linear, that is, in the lower institutional environment, political associations can play a positive mediating role between the institutional environment and the vertical innovation motivation of enterprises, which promotes the release of “institutional dividends”; However, when the overall institutional level is high, political correlation has a significant negative intermediary adjustment effect, which dilutes the “institutional dividend” effect to a certain extent. The possible explanation for this is that although it has been analyzed in the above theoretical analysis that with the improvement of the institutional environment, the “unfair competitive environment” and “property rights infringement” will be suppressed, but when the overall institutional environment level is low, the institutional improvement in the short term cannot be effective immediately, so the vertical motivation of enterprise innovation in this stage will still be in a state of inhibition, and the political association can be through the government-enterprise related channels such as information transmission, resource supply and property rights protection. Play a role in “lubrication” between the improvement of the institutional environment and the vertical innovation motivation of enterprises, which is conducive to the release of “institutional dividends”; However, in the higher stage of the institutional environment, political association shows a certain “curse effect”, because in a better institutional environment, political association may weaken the vertical innovation motivation of enterprises by reducing the market competition environment and excessive investment of enterprises, and form a certain dilution effect on the “institutional dividend”.

Table 1. Test results of political relevance on the mediating role of “institutional dividends”

	(1)	(2)	(3)
	variable being explained: patent_i	variable being explained: political	variable being explained: patent_i
sys	0.005*** (0.002)	1.423*** (0.338)	0.009** (0.004)
sys <sup>2</sup>		-0.089*** (0.023)	
political			0.032* (0.017)
control variable	control	control	control
_cons	0.712*** (0.252)	-5.374*** (1.114)	-0.881 (1.083)
N	4356	5647	3014
Wald chi-P	0.000	0.000	0.012
Sargan-P	0.429		0.810
AR (2)-P	0.947		0.324

#### 4. Conclusions

The analysis of the mediation adjustment of political associations in the “institutional dividend” effect found that when the institutional environment is poor, political associations can promote the release of “institutional dividends”, but when the institutional environment is better, political associations will play a certain dilution role in the “institutional dividend” effect. In the context of the country’s vigorous promotion of innovation-driven development strategies and the effective improvement of national innovation capabilities, the research conclusions of this paper are conducive to a more thorough understanding of the root causes of the “quantity and quality of innovation patents” in the past period of time, and can also provide strong policy enlightenment for how to improve the quality of enterprise innovation. From the perspective of corporate strategy, the “political correlation effect” has been controversial in the academic field, and the research in this paper finds that in the context of the continuous improvement of the institutional environment, the establishment of political association by enterprises is not a long-term sustainable behavior, and when the level of institutional environment is better, political association will dilute part of the “institutional dividend”.

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