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Empirical Analysis on the Relationship Between Institutional Pressure, Environmental Strategy and Corporate Environmental Performance

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ABSTRACT

This paper attempts to disclose the driving effect of institutional pressure on corporate environmental performance in the context of China. Firstly, the institutional pressure was divided into three dimensions: coercive pressure, normative pressure and mimetic pressure. Then, the authors established an analytical model of "institutional pressure-environmental strategy-environmental performance", and verified the model with the structural equation. The results show that corporate environmental performance is positively affected by coercive pressure and mimetic pressure, but not directly influenced by normative pressure; the three dimensions of institutional pressure all promote the environmental strategy; environmental strategy mediates the relationships between each dimension and environment performance. Further discussion and cause analysis were performed in the light of China's institutional environment. Finally, the authors summed up the theoretical contributions of this research and looked forward to the future research.

1. INTRODUCTION

The four-decade-long economic boom in China is accompanied by severe environmental pollutions. Currently, the industrial development of the country still features high consumption, high emissions and high input. This calls for a scientific environmental management system. In 2015, China proposed the concept of "greenization", making green development a national strategy. One year later, the Chinese government released the Industrial Green Development Plan (2016-2020), with the aim of greening traditional industries, building a green manufacturing system, and turning manufacturing efficient, clean, low-carbon and circular. The Plan stipulates that green development should be implemented in every domain and process of industry, and green manufacturing be a new engine of economic growth and source of competitive advantage by 2020. Hence, the coming years will be defined by two trends: the shift towards green manufacturing and the coordination between economy and environment.

Each enterprise has a unique strategy to cope with complex environmental issues. From resource- or institution-based view, the existing environmental strategies can be divided into different types and schools [1-6]. Some scholars verified whether these strategies could promote environmental performance, and quantified the promoting effects [3, 7]. Considering the complexity and concealment of environmental issues, this paper attempts to derive the metrics of corporate environmental behavior of in China from their environmental strategies, in the light of the relevant literature [8-11].

Moreover, much attention has been paid to the driving force of corporate environmental behavior. Studies have shown that stakeholders greatly motivate the environmental strategies of enterprises [1, 3, 12], and regulation directly stimulates the innovation of green products [13-15]. Delmas and Toffel [16] held that institutional pressure is the leading driver of corporate environmental behavior. However, there is little report on how institutions, especially informal ones, drive the environmental strategies in emerging countries like China, which has a complex and changing institutional environment. Hence, it is very meaningful to systematically quantify the driving force from the perspective of institutions. As a result, this paper also aims to empirically verify the driving effect of Chinese institutions on corporate environmental behavior, under the mature institutional theory from developed countries.

In addition, there is not yet a consensus on the effects of corporate environmental behavior on the overall performance or environmental performance [1, 2, 17-19]. For one thing, the metrics of environmental performance are difficult to quantify, because of the fuzzy boundary between environmental behavior and environmental performance; for another, environmental performance involves complex factors from multiple disciplines and domains. Thus, this paper tries to clarify the concept of environmental performance, atomize environmental performance in the context of China, and prepare environmental strategies that can effectively enhance environmental performance of Chinese enterprises.

From the institution-based view of strategic management, this paper puts forward a series of hypotheses on the influence of external institutional pressure over corporate environmental behavior, and verifies these hypotheses against 207 effective questionnaires. From an innovative perspective, the research results disclose the true driving force and internal cause of corporate environmental behavior, and provide reference for

enterprises to improve their environmental strategies and environmental performance.

2. THEORETICAL ANALYSIS AND HYPOTHESES

2.1 Institutional pressure and environmental strategy

In institutional theory, institutional pressure and environmental strategy are important perspectives to analyze inter-organizational relationships. The theory believes that the institutional environment strengthens institutional norms and beliefs, and highlights the value and propriety for an organization to comply with the institutional environment, and obey external rules and regulations. In the institution-based view, the motivation of institutional response determines the behavior norms and strategic choices of enterprises [20].

As champions of neo-institutionalism, DiMaggio and Powell [21] constructed an analysis framework that fully integrates the institutional elements in economics, society, and politics. The framework guides the changes of the macro system, and serves as an analysis tool for the interaction between enterprises and the environment. There are three pillars in the mechanism: coercive pressure, normative pressure and mimetic pressure.

This paper explores the relationship between corporate environmental behavior and institutional pressure under the above framework. Note that the institutional pressure here specifically refers to the pressure perceived by enterprises from the external institutional environment [16].

2.1.1 Coercive pressure and environmental strategy

Coercive pressure, the first dimension of institutional pressure [21], comes from the formal pressure of the target organization. This dimension has been stressed by all scholars of institutionalism. Under coercive pressure, the future behavior is influenced by coercive processes, including establishing rules, monitoring others' compliance, and giving rewards or penalties. The core components are coercive violence, rewards/penalties, and expedient responses [22] Compared with the other two dimensions of institutional pressure, coercive pressure clearly represents formal or official laws and regulations [23], and determines whether to reward or penalize others according to laws [24].

Over the years, many environmental problems have arisen under the negative externalities of economic activities. These problems cannot be mitigated by the market. Therefore, enterprises are forced to impose a high external cost on the society in the form of pollution, causing the eco-environment to deteriorate rapidly. Because of its special economic nature, environmental pollutions are difficult to be solved by market mechanism alone. Since the 1970s, enterprises in developed countries are urged to improve their environmental behavior by governments, societies and markets. The coercive environmental regulation has been proved effective in driving organizations to better environmental strategies [6, 25]. The main reason for enterprises to implement a positive environmental strategy is the threat of legal sanctions [26]. Under coercive pressure, enterprises are obliged to develop green products and pursue green management [5, 6, 13-16]. In addition, environmental regulation is the biggest source of pressure for enterprises to consider environmental strategies, for any enterprise failing to take environmental behavior will be penalized by the government [27].

In China, the environmental regulations are increasingly stringent. Li [28] confirmed the positive correlation between sewage charge system and green innovation, and the promoting effect of economic level on the correlation. Currently, the Chinese Ministry of Ecology and Environment is stepping up the regulation of environmental protection by means of trade protection and administrative penalties. From January to August 2016, environmental agencies at all levels in China reported a total of 1,172 environmental crimes, a year-on-year increase of 14%. In this developing country, coercive pressure is the key propeller of corporate environmental management [29]. Meanwhile, China remains the "world factory" and a major exporter. Chinese manufacturers are subjected to an enormous coercive pressure, which comes from regulations at home and abroad and from trade barriers [25]. For example, Europe has designed many regulatory plans and recycling agreements for the electronics industry [30]. In developed regions like Europe, Chinese enterprises are prompted to evaluate their recycling and reuse processes, according to such international regulations as the Waste Electrical and Electronic Equipment (WEEE) Directive [31].

Through the above theoretical analysis, the following hypothesis was put forward:

Hypothesis 1a: In the institutional environment, coercive pressure promotes corporate environmental strategy.

2.1.2 Normative pressure and environmental strategy

Normative pressure has a different legal basis from coercive pressure. It is often implicit and not recognized by outsiders [32]. The normative system emphasizes the obligatory, evaluative and explanatory dimensions of institution in social life. Social norms, values and ethics are all covered in the normative system [22], which exerts external pressure to actors. Petrenko et al. [33] suggested that an enterprise with a strong ethical tendency is highly sensitive to the pressure of environmental protection, and eagerly expects positive feedbacks from the outside.

Normative pressure also represents specialization and professionalism [34]. Those inside an organization must recognize the legitimacy of a particular structure and process in order to comply with this particular norm. The pressure mainly stems from the opinions of professional institutions, which are likely to be followed by actors and expected by the society and culture [35]. These institutions are generally formed empirically, and featured by standard operating procedures, professional codes and training courses [26]. Before making strategic choices on environmental issues, enterprises must fully consider the values, beliefs, and behavior standards of stakeholders. Otherwise, their environmental behavior will be deemed as illegitimate [36].

In recent years, more and more reports are issued on environmental issues like carbon emissions, raising wide public concerns. The environmental awareness and monitoring ability are growing across the board. To maintain their reputation, enterprises must take concrete actions to make up for the lack of government regulation [37, 38].

The Chinese government has created various systems to boost public participation in environmental governance, including but not limited to petition, complaint, and hearing. With the improvement of relevant laws and regulations, the public enjoys an increasing number of channels to join environmental protection. According to the *Measures for Public Participation in Environmental Protection* enacted in

2015, environmental agencies can solicit opinions and suggestions from citizens, legal persons and organizations through online survey, symposiums, hearings, etc.

Through the above theoretical analysis, the following hypothesis was put forward:

Hypothesis 1b: In the institutional environment, normative pressure promotes corporate environmental strategy.

2.1.3 Mimetic pressure and environmental strategy

Mimetic pressure means that, in an uncertain environment, an organization tends to follow the experience of the successful in choosing structure and behavior [39]. By imitating others, the organization acquires legitimacy [21, 40], and minimizes the risk of losing competitive advantage [41, 42]. Learning and imitation are natural responses based on the cognition of external environment. Imitation, a.k.a. Scott's cultural-cognitive pillar [43], can reduce the future uncertainty [44, 45]. Under the same institutional environment, enterprises will commit similar behaviors through learning and imitation, making the organization less variable [46] and more stable [35]. In other words, an enterprise can stabilize its behavior by cognizing and mimicking the shared experience and behavior of its peers. In this paper, mimetic pressure is understood as the pressure from external competitors, drawing on Zhu and Sarkis [48], Phan and Baird [34], and Zhong and Zheng [29].

On environmental issues, Jennings and Zandbergen [5] found that enterprises often imitate others' environmental behavior, facing uncertain environmental issues [27].

Bergh [49] noticed that an enterprise is strongly influenced by the environmental behavior of its competitors and other enterprises, and thus learn from their behavior. Kagan et al. [50] even held that competition is the key factor affecting environmental strategy. With advanced environmental strategy, market leaders set environmental benchmarks for competitors, posing a mimetic pressure on organizations in the same field [51]. The benchmarks redefine the legitimacy of the market. Then, enterprises will imitate the green strategy of legitimate market leaders, with the aim to widen market platform, acquire superior resources and obtain added value. This emulation process, which learns from industrial leaders and copies their path to success, is known as competitive benchmarking [29].

Under mimetic pressure, an organization will adopt the environmental strategy of market leaders to gain a competitive advantage. Zhu and Geng [36] suggested that mimetic pressure drives Chinese manufacturers to expand their supply chains, and thus energy and reduce pollution emissions. Yang et al. [10] discovered that the green management of Chinese enterprises is also pressurized by the environmental protection of their competitors. In the meantime, global trade has provided Chinese manufacturers with imitation opportunities, and enabled them to share environmental innovations with international competitors through the international supply chain, especially the enterprises having trade relationship with China [19, 48]. The sharing sets up benchmarks of environmental strategy and imitation objects for manufacturing in China.

Through the above theoretical analysis, the following hypothesis was put forward:

Hypothesis 1c: In the institutional environment, mimetic pressure promotes corporate environmental strategy.

2.2 Institutional pressure and environmental performance

In institutional theory, it is important for an organization to integrate and exist legally in the environment. To gain legitimacy, the organization needs to improve its environmental performance, such that its behavior could be recognized by the society. The neo-institutionalism argues that an enterprise is both the product of technology (as evidenced by the pursuit of the maximal efficiency and benefit) and institution. The legitimacy of an enterprise requires the institutionalization of environmental performance. More and more scholars have elaborated the motivation of corporate environmental behavior, and suggested an enterprise can satisfy the needs of external stakeholders by improving environmental performance, thus enhancing its ability to survive and develop amidst fierce competitions [52]. For example, Hoffman [26] analyzed the environmental issues of American enterprises from 1960 to 1993, and drew the following conclusions: multiple competitive systems often coexist in certain organizational fields; as these systems evolve and develop, the correlations between institutional elements (e.g. imitation, rules and regulations) will gradually increase, which directly affects the environmental performance of enterprises.

Empirical evidences have shown that institutional pressure does have a significant positive impact on environmental performance [53]. If an enterprise obeys the requirements of the institutional environment, it will receive great economic benefits, while promoting the energy conservation and emission reduction in its field [53]. Otherwise, if the enterprise does not follow the regulation (e.g. operating without a permit), it will be fined and penalized, and perform poorer than before [54, 6]. Chen [55] believed that the green innovation and green image of an enterprise ultimately depend on its green investment, under the joint effects of international regulations, the requirements of environmental protection organizations, and the green awareness of consumers. Based on spearman's rank correlation coefficient (rho), Zhao et al. [56] considered government departments and investors as major drivers of environmental performance, and concluded that 80% of environmental performance could be explained by the ability of the enterprise in environmental management and the environmental regulation by the government. In terms of mechanism, all three dimensions of institutional pressure, namely, coercive pressure, normative pressure and mimetic pressure, affect corporate environmental performance in an independent manner. Therefore, the enterprises that perceive consumer pressure (opportunity) will invest more resources and energy to implement their environmental strategies, aiming to improve their environmental performance [57]. Through an empirical study on 86 enterprises, Jiang [57] learned that competitive pressure (mimetic pressure) and consumer pressure (normative pressure) have significant positive impact on corporate environmental performance.

Through the above theoretical analysis, the following hypotheses were put forward in the light of the explorative case study:

Hypothesis 2a: The coercive pressure perceived by an enterprise has a positive impact on environmental performance.

Hypothesis 2b: The normative pressure perceived by an enterprise has a positive impact on environmental performance.

Hypothesis 2c: The mimetic pressure perceived by an enterprise has a positive impact on environmental performance.

2.3 Environmental strategy and environmental performance

According to the classic paradigm of "environment-strategy-performance", enterprise performance is always achieved under a certain strategy. This general pattern applies to the analysis on corporate environmental behavior. For an enterprise, the effect of environmental strategy is directly reflected by performance. Most studies have agreed that environmental strategy is positively correlated with environmental performance, and attributed the positive correlation to two factors.

Some scholars ascribed the positive correlation to the promoting effect of environmental strategy on enterprise competitiveness. For instance, Link and Naveh [58] inspected the relationship between environmental strategy and environmental performance against ISO14001 and Eco-Management and Audit Scheme (EMAS), and demonstrated the positive impact from environmental strategy to environmental performance. Porter and Linde [59] held that environmental strategy brings positive economic benefits to the enterprise by reducing resource waste in production, improving resource utilization, and boosting enterprise competitiveness. Through a survey on 105 Spanish enterprises, Aragn-Correa [4] proposed that the earlier an enterprise implements its environmental strategy, the more likely for the enterprise to excel its competitors in environmental performance. Their further research demonstrates that the growing performance is a driving force of active implementation of environmental strategy [4]. Radonjic and Tominc [60] empirically analyzed 36 Slovenian metal and chemical manufacturers, and proved that environmental strategy not only improves corporate environmental performance of enterprises, but also enhances competitive advantage through cultivating new organizational capabilities.

Some other scholars considered that an enterprise could improve its environmental performance through active response to environmental issues and strategic management of the environment, both of which reduce the capital cost and expenditure. Klassen and Whybark [18] empirically found that environmental strategies like pollution control can help improve corporate production and environmental performance by reducing environmental costs. Christmann [19] examined the environmental strategies of 88 chemical enterprises, and validated the impact of corporate environmental strategy on cost advantage: the earlier the implementation of environmental strategy, the greater the cost advantage and green output, and the better the environmental performance. Recently, Phan and Baird [34] further confirmed that environmental performance will be improved by implementing environmental strategy. In addition, Jiang and Teng [61] combed through the data on international manufacturing, and urged Chinese enterprises, whether large or small, to attach importance to environmental strategy, such as to obtain better environmental performance.

Through the above theoretical analysis, the following hypotheses were put forward:

Hypothesis 3: Environmental strategy has a positive impact on environmental performance.

Hypothesis 3a: Environmental strategy mediates the impact from coercive pressure to environmental performance.

Hypothesis 3b: Environmental strategy mediates the impact from normative pressure to environmental performance.

Hypothesis 3c: Environmental strategy mediates the impact from mimetic pressure to environmental performance.

3. METHODOLOGY

3.1 Sample and data collection

To obtain enough valid samples, the authors made early preparations, and collected samples in different forms through multiple channels.

(1) The contact information of many enterprises were obtained from the functional departments of the local government (including the commission of economy and information, foreign trade bureau, management committee of economic and technological development zone, and young entrepreneurs association), which had lasting connections with the authors or their research team. Then, the authors sent the URL of his questionnaire to these enterprises via WeChat or QQ.

(2) Some questionnaires were distributed by the heads of the Master of Business Administration (MBA) department, Wenzhou Polytechnic.

(3) Some questionnaires were issued in exhibition venues. The authors and their research team collected online information about exhibitions, telephoned the organizers to inquire about the type of industry and number of enterprises, and applied for passes online. Once arrived at an exhibition venue, the authors and their research team would judge whether an enterprise suits their sampling criteria by its posters. If yes, the enterprise manager would be invited to answer the questionnaire on smartphone by scanning a QR code. The author stayed in the venue to answer questions from the manager, until the response was submitted.

The sampled enterprises are rather balanced in scale: most of them (29.4%) have fewer than 300 employees, i.e. most samples are small enterprises; 25.0% and 23.5% of the samples are enterprises with 300-1,000 employees and 1,000-5,000 employees, respectively; there are relatively few (22.1%) extra-large enterprises with more than 5,000 employees.

3.2 Scales

For reliability, validity and comparability, mature scales were adopted and modified as per the research purpose and actual situation of Chinese enterprises. Except for items like enterprise ownership, all items were evaluated against the Likert five-point scale.

(1) Environmental performance

Environmental performance was evaluated from two dimensions (i.e. environmental financial performance and environmental quality performance) using the scale prepared by Motta [62]. Considering the complexity of environmental issues faced by Chinese enterprises, it might be difficult to explain the institutional environment and environmental issues in China solely based on foreign standards. Therefore, a total of 16 items were designed under the two dimensions, in reference to those proposed by LangfieldSmith et al. [63], Henri and Journeault [64], Phan and Baird [9], and Dong [11]. The 16-item scale is displayed in Appendix A.

(2) Institutional pressure

The institutional pressure was measured under the framework proposed by DiMaggio and Powell [21], which includes the dimensions of coercive pressure, normative

pressure and mimetic pressure. The items under the three dimensions were determined, in the light of the 16 items defined by Phan and Baird [34]. The results of Zhu et al. [36] and Boiral et al. [65] were integrated in the definition of these items. Considering the environmental issues in China and the institutional factors reported by the respondents to affect environment strategy, three new items from Kassinis et al. [66] and Qi et al. [8] are added to our scale. Qi et al. [8] mainly studied the driving factors of environmental upgrading among Chinese enterprises. Thus, the additive items can reflect the situation in China well, making the scale more adaptive to the status quo. The adaptability of the scale was further enhanced through factor analysis and modification. The final scale of institutional pressure contains 14 items (Appendix A).

(3) Environmental strategy

Hart [1] and Christman [19] suggested that environmental strategies focus either on process or product. Our scale of environmental strategy was designed based on the 95-item 11-dimension scale developed by Sharma and Vredenburg [3] for the oil and gas industry. To adapt to the situation in China, the scale was modified into the collection of 20 items in 8 dimensions by Yang et al. [10]. Considering the product and process dimensions of environmental strategy, this paper further revised Yang's scale based on the opinions of experts and managers, creating a 12-item scale (Appendix A).

3.3 Reliability and validity tests

Table 1. Results of characteristic factor analysis on institutional pressure

Items	Common factors 1	2	3
A_{11}	.273	.717	.190
A_{12}	.268	.854	.166
A_{13}	.238	.834	.285
A_{14}	.205	.783	.332
A_{15}	.151	.828	.190
A_{21}	.715	.143	.432
A_{22}	.793	.151	.431
A_{23}	.903	.300	.045
A_{24}	.802	.238	.260
A_{25}	.660	-.018	.629
A_{26}	.894	.301	.006
A_{27}	.885	.308	-.037
A_{28}	.779	.171	.493
A_{31}	.136	.368	.863
A_{32}	.178	.384	.739
A_{33}	.200	.358	.846
Characteristic root	9.782	2.364	1.572
Contribution to variance	35.182	24.341	21.174
Cumulative contribution to variance	35.182	59.524	80.697

Notes: The test methods are principal component analysis (PCA) and orthogonal varimax rotation, and the data are prepared by the authors.

The above scales were subjected to reliability and validity analysis through exploratory factor analysis (EFA), confirmatory factor analysis (CFA), Cronbach's alpha (α) and composite reliability test. Before factor analysis, the data must pass the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity. As shown in Tables 1-3, the test results of all three scales agree well with the theoretical results. The few factors with a smaller-than-0.5 load (Table 2) were deleted to enhance the validity.

Table 2. Results of characteristic factor analysis on environmental strategy

Items	Common factors 1	2
B_{11}	.745	-.154
B_{12}	.791	-.032
B_{13}	.795	-.108
B_{14}	.798	.364
B_{15}	.789	.270
B_{16}	.745	.269
B_{21}	-.140	.511
B_{22}	.209	.635
B_{23}	-.135	.811
B_{24}	.033	.822
B_{25}	.195	.870
B_{26}	.159	.836
Characteristic root	4.862	3.085
Contribution to variance	31.956	29.175
Cumulative contribution to variance	31.956	61.131

Notes: The test methods are principal component analysis (PCA) and orthogonal varimax rotation, and the data are prepared by the authors.

Table 3. Results of characteristic factor analysis on environmental performance

Items	Common factors 1	2
C_{11}	.643	.512
C_{12}	.817	.273
C_{13}	.660	.468
C_{14}	.746	.353
C_{15}	.878	.211
C_{16}	.863	.297
C_{17}	.855	.319
C_{18}	.651	.446
C_{19}	.790	.409
C_{21}	.179	.793
C_{22}	.368	.796
C_{23}	.327	.844
C_{24}	.340	.872
C_{25}	.395	.861
C_{26}	.384	.826
C_{27}	.460	.774
Characteristic root	13.919	2.533
Contribution to variance	41.699	36.646
Cumulative contribution to variance	41.699	78.345

Notes: The test methods are principal component analysis (PCA) and orthogonal varimax rotation, and the data are prepared by the authors.

Table 4. Reliability of each scale

Type of construct (dimension)	Item-to-total correlation Min.	Max.	Cronbach's α
Coercive pressure	0.690	0.862	0.920
Normative pressure	0.761	0.900	0.959
Mimetic pressure	0.795	0.936	0.941
Environmental strategy	0.367	0.811	0.801
Environmental performance	0.798	0.913	0.960

Note: The data are prepared by the authors.

Due to the lack of repeated measurements, the data validity was measured by Cronbach's α, Cronbach's alpha coefficients for the final scales were calculated to ensure the reliability values exceeded the threshold of 0.7 [67]. Table 4 lists the

results of reliability tests on the proposed scales. The results show that the Cronbach's α of every construct, every dimension of each construct and the item-to-total correlation of each item all passed the reliability tests. This means the samples were consistent and stable, and suitable for factor analysis.

4. RESULTS ANALYSIS

4.1 Empirical results

Since all core constructs to be quantified are latent variables, structural equation modelling (SEM) was adopted for data processing and path analysis. The variables, namely, coercive pressure, normative pressure, mimetic pressure, environmental strategy and environmental performance, were introduced to the structural equation, forming a full-model analysis framework (Figure 1). Among them, the three constructs, i.e. coercive pressure, normative pressure and mimetic pressure, were rated against the corresponding items in the questionnaire. Meanwhile, the items for environmental strategy and environmental performance were reduced: the mean of all items in each of the two dimensions was taken as the score of that dimension, and used as a latent variable.

In addition, all variables were subjected to skewness and kurtosis analyses to fulfil the requirements on the distribution of input data. The analysis results confirm that the skewness and kurtosis of every variable were below the required thresholds: the absolute skewness must be smaller than 3 and the absolute kurtosis must be smaller than 10.

Model fitting was performed in two steps: the introduction of the covariance matrix and the iteration on AMOS, a visual program for the SEM. The fitting discloses the relationships between the constructs, and the factor load of each latent variable.

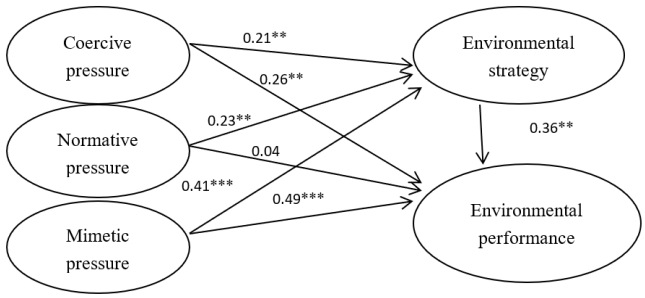

Figure 1. Fitting results of model fitting

Table 5. Path coefficients and test indices of variables in each dimension

Path description	Normalized estimate	P-value	Hypothesis is valid?
Coercive pressure→ Environmental strategy	0.21	0.002**	Yes
Normative pressure→ Environmental strategy	0.23	0.001**	Yes
Mimetic pressure→ Environmental strategy	0.41	***	Yes
Coercive pressure→ Environmental performance	0.26	0.002**	Yes
Normative pressure → Environmental performance	-0.04	0.844	No
Mimetic pressure→ Environmental performance	0.49	***	Yes
Environmental strategy→ Environmental performance	0.36	0.001**	Yes
Test indices of fitting results	**Fitting results**	**Critical values**	
x^2/df	2.974	<2.00 (rigorous) or <3.00 (neural) or <5.00 (slightly relax)	
GFI	0.917	>0.9; the closer to 1, the better.	
RMSEA	0.067	<0.08 (neutral), <0.05 (slightly good); the smaller, the better.	
RMR	0.044	<0.05; the smaller, the better.	
NFI	0.914	>0.9 (neutral), >0.95 (slightly good); the closer to 1, the better.	
CFI	0.945	>0.9 (neutral), >0.95 (slightly good); the closer to 1, the better.	

Note: ***p<0.001, **p<0.01, and *p<0.05; x^2/ df is ratio of chi-square to the degree of freedom; GFI is the goodness-of-fit index; RMSEA is the root mean square error of approximation; RMR is the root mean square residual; NFI is the normed fit index; CFI is the comparative fit index.

It can be seen from Table 5 that the fitting results were basically satisfactory after the eight paths were corrected based on the residuals outputted by the AMOS. Specifically, the x^2/ df of 2.974 is smaller than the critical value of 3 (neutral value)[68]; the RMSEA of 0.067 is smaller than the critical value of 0.10[69]; the NFI, GFI and CFI all reached the critical value of 0.9 [70]. Besides, the factor load of every latent variable passed the significance test.

The results of model fitting (Figure 1) show that coercive pressure, normative pressure and mimetic pressure have prominent impacts on environmental strategy. Therefore, under the legitimacy constraint, institutional pressure, which involves laws and regulations, policy guidance, industry standards, public values, corporate identity and behavioral imitation, obviously influences the environmental strategy. In other words, hypotheses 1a, 1b and 1c are valid.

When it comes to the correlation between each dimension of institutional pressure and environmental performance, the path coefficients from coercive pressure to environmental performance and from mimetic pressure to environmental performance were the same with theoretical results and passed the significance tests. Therefore, hypotheses 2a and 2c are valid. However, the path coefficient from normative pressure to environmental performance was -0.04, which is different from the theoretical result, and p=0.844>0.05 did not pass the significance test. This means hypothesis 2b failed the model

analysis.

It can also be seen from Figure 1 that environmental strategy greatly influenced environmental performance, which proves the validity of hypothesis 3. Besides, environmental strategy fully or partially mediates the relationships between different dimensions of institutional pressure and environmental performance. Therefore, hypotheses 3a, 3b and 3c were proved valid. Specifically, environmental strategy partially mediates the relationship between coercive pressure and environmental financial performance, and that between mimetic pressure and environmental financial performance; environmental strategy fully mediates the relationship between normative pressure and environmental performance. To sum up, environmental strategy is critical in responding to institutional pressure and promoting corporate environmental performance, although environmental strategies vary greatly among Chinese enterprises. The critical role of environmental strategy is in line with the classic framework of "environment-strategy-performance"[71].

4.2 Discussion

There are three dimensions of the institutional pressure perceived by enterprises: coercive pressure, normative pressure and mimetic pressure. The three dimensions differ in the significance and degree of influence over environmental performance. Our research reveals that both coercive pressure and mimetic pressure have significant positive effects of corporate environmental performance. Further comparison shows that the mimetic pressure exerts a far greater influence on environmental performance than coercive pressure.

The above results indicate that China should increase the coercive pressure and the cost of crimes by implementing stricter laws, regulations, policies and reporting systems on environmental protection. In 2014, the *Environmental Protection Law of the People's Republic of China* was amended for the first time in 25 years. The amendment improves many environmental systems (e.g. environmental monitoring, environmental impact assessment, cross-regional pollution prevention and pollution permit management), and increases the supervision strength and fines. Despite this effort, the law has not been forcefully implemented. The promoting effect of institutional pressure on environmental behavior is weakened by improper acts to obtain legitimacy. For example, some enterprises have committed greenwashing or pretended to adopt environmental strategies [72] Besides, our surveys on enterprises show that there are relatively few incentives in environmental legislation, and the entire coercive system needs to be improved.

Owing to institutional uncertainty and industry competition, mimetic pressure mainly comes from competition. To maintain the competitive advantage, enterprises are increasingly aware of the importance of environmental legitimacy, under the peer pressure from competitors. In fact, it is very easy to gain advantages in cost, techniques and management by mimicking the environmental behavior of competitors. This is a low-cost and safe means for enterprises to acquire a competitive edge in the market. Thus, environmental performance could be bolstered easily by mimetic pressure, which echoes with our research results.

The positive correlation between normative pressure and environmental performance failed to pass the significance test. The failure can be explained as follows: Since the late 1970s, China has been striving to develop its economy, and started late in environmental protection. As a result, the normative pressure from the industry, the media and other areas is not sufficiently compulsory. The impact of social norms and values evolves slowly. It is only recently that China begins to focus on environmental issues. There is still a long way to go before the Chinese form a green value system.

5. CONCLUSIONS

The institution-based view of strategy is a relatively new research domain. The academic generally regards the influence mechanism of the institutional environment on corporate strategic behavior as a black box. This paper fully integrates the neo-institutionalism theory of organizational sociology with the theory of enterprise strategic management, and relies on the integrated theory to demonstrate the importance of institutional factors to strategy formulation. Moreover, an empirical analysis was conducted to disclose how much corporate strategic behavior and strategic choices are influenced by institutional factors and the dimensions of institutional pressure, and identify the sources of these influences. By integrating institutional factors into the existing theoretical framework, the authors gave a complete explanation of corporate strategic behavior and its paths, and disclosed the internal mechanism of institutional impacts on corporate strategy. In the meantime, the mature institutional theories for markets and institutional environments in developed countries were extended to the institutional environment of the largest developing country in the world, with the aim to identify how China's institutional environment affects environmental strategy and environmental behavior.

In addition, the research conclusions have certain contributions, shedding new light on the relationship between institutional pressure and environmental performance in China. In our research, the hypothesis that normative pressure, a dimension of institutional pressure, promotes environmental performance failed the empirical test, while the hypotheses that coercive pressure and mimetic pressure promote environmental performance were verified. These results contradict the promoting effect of institutional pressure on environmental performance in foreign scenarios: Phan and Baird [34] demonstrated that environmental performance is greatly promoted by coercive pressure and normative pressure, and slightly promoted by mimetic pressure. The contradiction is resulted from the following two facts: On the one hand, social stakeholders have not formed a value system of environmental responsibility, although China has begun to highlight environmental issues; it takes a long and gradual process to form such a system. On the other hand, China is currently transforming its economic system, causing uncertainties in social development and policy guidance; for stability and safety, an enterprise prefers to mimic the strategic measures of successful or benchmark enterprises.

Of course, there are several limitations of our research, due to its particularity and sensitivity. First, the authors did not compare the influence mechanisms of institutional pressure on environmental performance between different regions, especially the different promoting effects in each dimension of institutional pressure across regions. China is a country with a large landmass. The institutional environment varies from region to region. For example, the eastern coastal cities have a much different institutional environment from the western hinterland. Second, the research is limited to the

manufacturing industry, although different industries differ in the sensitivity to the environmental protection system. To solve these limitations, the future research will probe into the relationship between institutional pressure and environmental performance in different regions and industries of China.

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APPENDIX A

Scale of corporate environmental performance

Variables	Primary indices	Secondary indices	Sources
Environmental financial performance	Increase in sales	Increase in market share and benefits of green products	Dong Ying[11]
		Benefits of recycling by-products	Dong Ying [11]
		Added value of green products	Dong Ying [11]
	Reduction of production cost	Reduction of energy consumption	Dong Ying [11]; Langfield Smith et al. [63]; Thanh Nguyet Phan [9]
		Cost reduction through replacement with green materials	Dong Ying [11]
		Cost reduction through optimization of production steps	Dong Ying [11]; Langfield Smith et al. [63]; Thanh Nguyet Phan [9]
	Environmental benefits	Reduction of waste disposal cost	Dong Ying [11]
		Reduction of accident/pollution fines and charges	Dong Ying [11]; Langfield Smith et al. [63]; Thanh Nguyet Phan [9]
		Benefits of waste recycling	Dong Ying [11]
Environmental quality performance	Better corporate image	Better corporate reputation and environmental image	Dong Ying [11]
	Better relationship with external parties	Better relationships with suppliers and consumers	Dong Ying [11]
		Better relationship with the government	Dong Ying [11]
		Better coordination with other stakeholders like communities and environmental organizations	Dong Ying [11]; Henri and Journeault [64]; Thanh Nguyet Phan [9]
	Better satisfaction	Better consumer satisfaction	Dong Ying [11]
		Better market satisfaction	Dong Ying [11]
		Better employee satisfaction	Dong Ying [11]
Bases of item selection: Langfield Smith et al.[63]; Henri and Journeault [64]; Dong Ying [11]; Thanh Nguyet Phan [9]			

Scale of institutional pressure perceived by enterprises

Variables	Items (indices)	Sources
Coercive pressure	International environmental standards and regulations	Zhu and Geng [36]
	Domestic environmental standards and regulations	Zhu and Geng [36]
	Local environmental standards and regulations	Zhu and Geng [36]
	Survey reports or site surveys of environmental agencies	Kassinis and Vafeas [66]
	Opinions of government departments on handling environmental complaint letters or on-site complaints	Qi Guoyou [8]
Normative pressure	Pressure from environmental awareness of benchmarking enterprises in the industry	Boiral and Henri [65]
	Pressure from environmental awareness of employees	Boiral and Henri [65]
	Pressure from environmental awareness of consumers	Boiral and Henri [65]
	Pressure from media attention to industry environmental issues	Boiral and Henri [65]
	Pressure from environmental awareness of the public (e.g. communities and nongovernmental organizations (NGOs)	Zhu and Geng [36]
	Pressure from professional organizations' attention to environmental issues	Zhu and Geng [36]
	Pressure from suppliers/partners/clients on environmental issues	Boiral and Henri [65]
	Pressure from corporate environmental policy in terms of vision and purpose	Phan and Baird [34]
Mimetic pressure	Pressure from environmental strategy implemented by major competitors of similar products	Zhu and Geng [36]
	Pressure from environmental strategy implemented by manufacturers of substitute products	Zhu and Geng [36]
	Pressure from industry competition	Boiral and Henri [65]
Bases of item selection: Kassinis and Vafeas [66]; Zhu and Geng[36]; Boiral and Henri [65]; Qi Guoyou [8]; Phan and Baird [34]		

Scale of corporate environmental strategy

Variables	Items (indices)	Sources
	Harmful ingredients in products have gradually decreased.	Chiou[73]

Product-based environmental strategy	Product packaging and the use of recyclable/reusable packaging materials have gradually decreased.	Shama and Vredenburg [3]; Christman[19]
	Products are eco-certified and use eco-labels.	Qi Guoyou [8]
	Products have applied for environmental related patents.	Pascual Berrone et al. [24]
	The benefits of green products have been publicized.	Christman[19]
	Green performance has been highlighted in product development.	Yang Defeng [10]; Dong Ying [11]
Process-based environmental strategy	Green equipment, fuels and energies have been invested actively.	Shama and Vredenburg [3]
	The emissions and harmfulness of wastes have been controlled in production process.	Shama and Vredenburg[3]
	Measures have been prepared to control environmental accidents and the leak of hazardous material.	Shama and Vredenburg[3]
	Relevant policies, rules and regulations have been formulated.	Henriques and Sadorsky [47]
	Indices and targets of environmental performance have been set.	Thanh Nguyet Phan [9]
	Environmental information has been disclosed regularly.	Henriques and Sadorsky [47]
	*Environmental training of employees has been highlighted.	Shama and Vredenburg [3]; Henriques and Sadorsky [47]

Bases of item selection: Shama and Vredenburg [3]; Christman[19]; Henriques and Sadorsky [47]; Chiou [73]; Qi Guoyou [8]; Thanh Nguyet Phan [9]; Yang Defeng [10]; Dong Ying [11]

*The factor load of "Environmental training of employees has been highlighted" was smaller than the critical value of 0.5, indicating that most information of the item cannot be effectively explained. Hence, this item was deleted from the scale.