

## Aims & Scope

*Contemporary Social Sciences* aims to present the most outstanding research and achievements in the field of social sciences in China. The scopes of research fields for consideration include, but not limited to: political science, economics, literature, linguistics, journalism and communication, education, sociology, philosophy, history, law and interdisciplinary research. *Contemporary Social Sciences* enhances the international discourse of China and seeks to promote communication and cooperation between scholars from China and the rest of the world.

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The English periodical of *Contemporary Social Sciences* is an English bimonthly periodical founded by Sichuan Academy of Social Sciences and approved by the National Radio and Television Administration of the People's Republic of China (formerly the State Administration of Press, Publication, Radio, Film and Television of the People's Republic of China) in March, 2016. As the first English periodical sponsored by a local academy of social sciences, it fills the lack of English periodicals by local academy of social sciences nationwide. In accordance with the requirements of the State Press and Publication Administration of Radio, Film and Television, this periodical will "adhere to correct direction of operation, publish outstanding research achievements in the field of social sciences of China, demonstrate the excellent research achievements in the development of western China and China's opening up, promote the academic achievements in order to 'go global' and enhance China's international discourse in the field of social sciences."

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The inaugural issue of *Contemporary Social Sciences* was published in October 2016. It is a bimonthly publication according to the requirements of the State Press and Publication Administration of Radio, Film and Television and there are totally 6 issues per year.



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**主办单位:** 四川省社会科学院研究生院

**Publishing:** Editorial Department of *Contemporary Social Sciences*,  
Sichuan Academy of Social Sciences

**编辑出版发行:** 四川省社会科学院《当代社会科学(英文)》编辑部

**Typesetting:** Sichuan Yuanjin Culture Co., Ltd.

**排版设计:** 四川远近文化有限公司

**Printing:** Chuanyin Culture Group Co., Ltd.

**印刷:** 川印文化集团股份有限公司

**Distribution Scope:** Domestic and International

**发行范围:** 国内外公开发行

**Postal Issue Code:** 62-613

**邮发代号:** 62-613

**国内统一刊号:** CN: 51-1771/C

**国际标准刊号:** ISSN: 2096-0212

**E-mail:** css1639@163.com

**邮箱:** css1639@163.com

**Tel:** (028) 61352442

**办公室电话:** (028) 61352442

**Address:** No. 155, West 1st Section of First Ring Road, Qingyang  
District, Chengdu, Sichuan Province, China

**地址:** 中国四川省成都市青羊区一环路西一段155号

**Post Code:** 610072

**邮编:** 610072

**Publishing Date:** March 30, 2021

**出版日期:** 2021年3月30日

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# *Research on English Translation of Chinese Literary Terms from the Perspective of International Communication: Interpretation and Standardization*

Peng Yanghua

Chengdu College of Arts & Sciences

Yao Lianbing\*

University of Electronic Science and Technology of China

**Abstract:** Literary terms are the crystallization of Chinese ideology and wisdom. Translation and communication function as an important link in the construction of the discourse system with Chinese characteristics. Standardized translation of literary terms is an important way to help the world understand China and promote international communication of Chinese culture, which is conducive to the inheritance and interpretation of fine traditional Chinese culture. From the perspective of the “going global” strategy of Chinese culture in the new era, and the existing asymmetry of English translation of Chinese literary terms in international cultural communication, we analyzed the divergence, variation and imposed interpretation of the translations of Chinese literary terms and put forward some suggestions for their standardization. We believe that the translation of Chinese literary terms should adhere to the principle of “localization” in cultural communication and focus on the transmission of Chinese cultural connotation to correct the imposed interpretations of Chinese literature in the West. Standardizing the translations of literary terms will facilitate the communication of “Chinese knowledge” to the world. The paper is expected to provide reference for research on construction and enhancement of discourse system for global communication with Chinese characteristics.

**Keywords:** Chinese literary terms, translation and communication, variation and hermeneutic study, standardization

**DOI:** <http://dx.doi.org/10.19873/j.cnki.2096-0212.2021.02.001>

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\* Peng Yanghua, School of International Studies, Chengdu College of Arts & Sciences; Yao Lianbing, School of Foreign Languages, University of Electronic Science and Technology of China.

This article was funded by the National Social Science Fund of China “Research on Henry H. Remak’s Thoughts in Comparative Literature” (20FWWB018) and the research project of Translators Association of Sichuan “On the Translation of Chinese Literary Terms from the Perspective of International Communication” (YX2020011).

Correspondence concerning this article should be addressed to Peng Yanghua, School of International Studies, Chengdu College of Arts & Sciences, Chengdu. E-mail: pengls@126.com.

## Introduction

The “Belt and Road” Initiative and the national strategies of “Chinese culture going global” increasingly facilitate the Chinese translation projects which have enhanced the translation of Chinese literature, and the successful promotion of literary works to other countries, which cannot be separated from the guiding role of literary criticism and literary discourse. Literary terms function as the core of literary criticism and discourse, so the standardization of their translation is not only of great significance to the construction of literary disciplines, but also an important premise for the effective development of literary exchanges (Qiu, 2017). However, the translation of literary terms is often irregular and vague, and there are frequent misinterpretations, mistranslations and disunity even for the same Chinese literary terms in the field of literary research, which not only affects people’s correct understanding of literary works, but also has a lagging effect on literary translations. The uncertainty of translation of literary terms is not conducive to the positive development of Chinese and foreign literature research and criticism, and it will hinder the communication and transmission of Chinese literature and culture. Therefore, the translation of and research on Chinese literary terms becomes an important issue in the fields of literature and translation.

To get a better understanding of the current research on literary terminology translation in China, we conducted data retrievals by searching for the key words and items of “literary translation,” “terminology translation,” “literary terminology” and “literary terminology translation” with the assistance of China National Knowledge Infrastructure (CNKI). We found that the researches on terminology translation were mainly related to science and technology. It seems that the translation of literary terms has been neglected as there are no in-depth theoretical analyses of this subject. Chen Zhigan and Wang Yufeng (2013) clearly pointed out that domestic academic researchers had made some achievements in terms of terminology translation, but the research on literary terms translation was weak; Fu Huisheng (2011) claimed that there was not much research and few achievements in the English translation of Chinese literary terms. This is detrimental to the current goal of communicating China’s culture to the world. In view of this, we decided to analyze the divergence, variation and imposed interpretation of the translation of Chinese literary terms and probe the important value of the standardization of English translation of Chinese literary terms (CLT) to facilitate international communication of “Chinese knowledge” to the world and provide reference for research on construction and enhancement of discourse system for global communication with Chinese characteristics.

## Variation and Hermeneutic Study of Chinese Literary Terms

### Issues of Terminology

Terminology is a special term used to express the meaning of strict regulations in various



disciplines. There is a set of ideas, a system, and even a tradition in terms which are closely related to culture. The professional, scientific, systematic, and unitary characteristics of terminology determine that it is important to distinguish different disciplines, and also represent the historical development, present levels, and status quo of this discipline to a certain extent (Zhuang, 2018). As terminology is the product of the development of science and culture, the development of cultural exchange promotes the spread of terminology, together with new discoveries and concepts. People of all ethnic groups absorb information into their own cultural systems through various ways, self-made and borrowed (Fu, 2011). In the report delivered at the 19th National Congress of the Communist Party of China, Xi Jinping emphasized the importance of strengthening cultural exchanges between China and other countries to “improve our capacity for engaging in international communication so as to tell China’s stories well, present a true, multi-dimensional, and panoramic view of China, and enhance our country’s cultural soft power.” How to make terminologies serve cultural communication effectively is a major problem in the historical and cultural arenas (Zhou, 1992).

Literature is not only a language art but also an important social ideology. It reflects social traditions, local conditions and customs, national dialogue, and people’s feelings. Literary terms are the definition and refinement of literary practice theory. Due to the different historical developments and social practices between China and Western countries, there are differences in social consciousness. These differences exist in literature, in literary research, and even in the meaning and application of commonly used terms in literary theory. Gu Zhengkun (1998) holds that terms are the starting point of academic research and theoretical construction, and that if the starting point is wrong, it is difficult to expect the research direction to be correct. Terminology translation, as a translation activity that communicates expertise between languages, plays an important role in the process of international academic exchanges. The English translation of Chinese literary terms is the conversion of terms between two different language systems and two different ideological systems.

### Variation of Chinese Literary Terms

In the practical introduction and translation of Chinese literature, especially Chinese literary terms, there is divergence, variation, and imposed interpretation in the English world. For example, literary texts are usually divided into four categories: *Shige*, *Sanwen*, *Xiaoshuo*, and *Xiju* in Chinese Pinyin on the basis of the quartering method, which is a classification of Chinese literature according to the structure, system and language use of the works. In most cases, the corresponding English translation is “poetry, prose, fiction, and drama,” which is not completely consistent with the original concepts in Chinese. Chinese *Shige* and *Sanwen* in Chinese Pinyin have a long history, and their meanings and significance are dissimilar to poetry and prose in both their contents and their forms in English. For another example, the commonly used Chinese literary terms such as “emotional,” “lyrical,” “typical plot” and “clear theme,” do not



appear frequently in English commentaries on essays. These terms do not communicate good inclinations to English readers although they are used to express positive emotions in Chinese. It is not derogatory to express the author's true feelings in Chinese, but the corresponding translation "sentimental" may make people feel bad or be even misunderstood as satire or ridicule. The understanding, thinking and evaluation of literary terms in Chinese and Western cultures are partially overlapping, partially modified and sometimes even completely absent due to the different social environments of literary practice.

From collections of Chinese literary works, the history of Chinese literature and the English versions of Chinese-English dictionaries, it is easy to see that the English translation of Chinese literary terms has undergone the following four methods. In the first, the method of English translation of Chinese literary terms was to adopt transliteration completely. Because Wade Giles romanization is similar to English pronunciation and spelling, it was used widely in the English versions of most of the books in earlier literary history. For example, Victor H. Mair (1994), an influential American Sinologist, adopted the Wechsler Pinyin system in *The Columbia Anthology of Traditional Chinese Literature*. Subsequently, Kang-I Sun Chang from Yale University and Stephen Owen from Harvard University adopted the modern Chinese Pinyin system in *The Cambridge History of Chinese Literature*, which truly constructs the history of Chinese literature from the characteristics of the source language, rather than phoneticizing Chinese terms with English pronunciation. The exclusive application of Pinyin is conducive to maintaining the characteristics of Chinese literary terms and highlighting the cultural independence of the target language. However, additional explanations or annotations are needed to convey its inherent meaning and to achieve a pragmatic effect. Sinologist Stephen Owen (2003) claimed that those translations were good for nothing without additional explanations, which indicated the importance of additional explanations or annotations in the English translation of Chinese literary terms.

In the second, the method of Chinese Pinyin together with additional explanations is employed in the English translation of Chinese literary terms. Examples can be found in the English translation of the basic terms of Chinese *Shige* in Pinyin "Ya, Fu, Ci, Qu" in the *New Oxford Dictionary of English*. For example, "Ci" is translated as "Ci, lyric meters, poems in irregular meters, lyric;" *Yuefu Shi* is translated as "*Yuefu Shi*, Music Bureau poems." These English translations can make up for the defects of complete transliteration, but it is difficult to express them clearly in a few words if the connotations of the literary terms are complex. As for the Chinese literary term "Ya" in Pinyin, many people translate it as "ode" corresponding to English literary term. In fact, there is a big difference between the two words "Ya" in Chinese and "ode" in English. Also, the meanings vary greatly from language to language. From the literal meaning of words, it is better to borrow the English word "graces" than the word "ode" to translate the Chinese word "Ya." Absurdly, the Chinese literary terms "*Daya*" and "*Xiaoya*" have been translated into "less odes" and "greater odes" respectively, which is a farfetched illustration.

Therefore, when translating Chinese literary terms into English, we should creatively use the English word “graces” as a term to highlight the uniqueness of the classification of Chinese literary styles rather than using the English literary term “ode” used by Westerners in the past.

The third method is the literal translation of Chinese literary terms. An example is the literal translation of the Chinese literary term “Dao,” found in the ancient literary theory monograph *The Literary Mind and the Carving of Dragons* written by Liu Xie, a literary theorist in the Southern Dynasties (420-589) of China. James L. Y. Liu, a famous Chinese American scholar of comparative poetics, translated “Dao” into “natural principle” while Stephen Owen translated it as “the way.” Though their translations of the same Chinese literary term were different, both employed the same method of literal translation. More examples of literal translations are illustrated in the poems and songs centered on palace life which were recited at the eastern palace in the Southern Dynasties and translated into “palace-style poetry.” Poems describing landscapes were translated into “mountain and stream school of art,” which originated from poet Xie Lingyun in the Eastern Jin Dynasty (317-420). The literal translation of the Chinese literary term “Bianwen” into “transformation text” still can be seen. To a certain extent, the literal translation method can help English readers understand the general meaning of terms from time to time, but it is not necessarily better, and can even cause the characteristics of the original term to be lost.

The fourth method of translation is to apply Western literary terms to Chinese literary terms completely. For instance, the translation of the Chinese literary term “*Ci*” has been translated into “lyric,” “*Xiaoshuo*” into “novel” or “fiction,” “*Fu*” into “rhapsody,” and “magic realism” into “magic reality.” Authoritative dictionaries tell us that there are differences between the English word “lyric” and the Chinese “*Ci*.” The connotation and scope of the Chinese word “*Ci*” is much wider than that of the English word “lyric.” There is a semantic intersection between them, but most of the characteristics of the Chinese word “*Ci*” are not included in the English word “lyric.” This kind of translation of Chinese literary terms with meaningful overlapping English terms is conducive to the understanding and acceptance of readers in the English world and is helpful to cultural communication in the short term. However, in the long run, replacing Chinese literary terms with the literary terms of other countries is in fact an imposed interpretation of Chinese literature in the Western discourse mode by using Western terms, which fundamentally jeopardizes the spreading of Chinese literature in international communication.

### Hermeneutic Study of Chinese Literary Terms

The translation of Chinese literary terms with Western literary terms mentioned above has attracted the attention of scholars at home and abroad. Terms are loaded with a complex history and rooted in the shared conditions of history, which is an important part of one civilization. The interpretation of Chinese literature through Western ways of thinking and logic modes will completely replace the complexity of historical conditions carried by the terms themselves. Cao Shunqing (1999) pointed out that we would lose our way of knowledge in this overall switch

between Chinese and Western knowledge, which put Chinese literary terms in the situation of “aphasia” in the other cultural context. This often implies the potential of Western centralism, and if we are not careful, we will fall into the trap of the superiority of Western literature.

Following Cao Shunqing’s “aphasia” interpretation of Chinese literary theory in the context of Western literary theory discourse, Zhang Jiang (2015) put forward the theory of “imposed interpretation.” In his opinion, imposed interpretation refers to the deviation from the textual discourse and dispelling literary indications by interpreting the text and literature in accordance with the subjective intentions and conclusions of the theorists in the past position and mode, which is mainly characterized by external expropriation, subjective presupposition, and an illogically cognitive path of chaos. Both “aphasia” and “imposed interpretation” mentioned here not only exist in the mutual elucidation between Chinese and Western literary theories, but also reflect the current situation of the translation of traditional Chinese literary terms which, to a certain extent, provide inspiration for the translation of Chinese literary terms. The examination and judgment of Chinese literature from the perspective of the other instead of their own viewpoint make the Chinese literary terms inevitably fall into the situation of “aphasia” in the cultural context of the other, and the corresponding translation is bound to be “imposed translation” accordingly.

Chinese literary terms are the linguistic crystallization of “Chinese knowledge” with Chinese characteristics and distinct particularities. According to the theory of “local knowledge” put forward by Clifford Geertz (2000), an anthropologist of interpretive anthropology, Chinese literary terms have a strong trait of “locality.” In the process of the practice of cross-cultural communication of terms, this particularity and “locality” are further complicated due to the heterogeneity of another language and culture. Therefore, the translation of cross-context literary terms is always faced with problems and challenges. As Xia Xiu (2015) said, it was the objective for any literary culture with an independent tradition to sustain the heterogeneity of the other culture, and it was absolutely true that the foreign ideas and theoretical resources of the local culture and its artistic traditions are incompatible and there can even be total differences in connotations and denotations of the same concept in different contexts. Different terms of the same thing or concept will be produced because they appear or are discussed in different countries with different historical backgrounds. Even the diversity of things determines the universality of terminology differences. It is the divergence caused by diversity that makes it hard to judge the translation of terminology as good or bad. Therefore the compromise of “convention into custom” needs to be emphasized (Fu, 2011).

### **Standardizing the English Translation of Literary Terms**

With the development of a global economy, the issues of “glocalization of globalization” (Robertson, 1992) become increasingly popular, which truly reflects the common demands of all different ethnic groups to maintain their own cultural diversity. Since the one-dimensional way

of thinking in the past practice of human cross-cultural communication has been broken, the interactions between globalization and localization have become a new starting point. Several centuries ago, missionaries in China translated literary terms in the practice of translating Chinese classical literature. However, there were many limitations of “shaping by other” in nature inevitably in the cross-lingual communication of Chinese knowledge dominated by the West. These defects often led to misinterpretations, mistranslations or even misunderstandings, which have brought some negative effects on the acceptance and identification of “Chinese knowledge.” As an origins of world civilization, the uniqueness of Chinese culture needs to be understood by people all over the world by means of effective translation. To solve this historical and realistic problem, it is quite necessary to spread the discourse with Chinese characteristics independently, and the “standardization” of terminology translation with Chinese characteristics is a top priority (Wei, 2019).

Ancient Chinese sage Confucius, in his theory of name rectification, thought if the name was not right then speech would not be in order, and if speech was not in order then nothing would be accomplished, which was inspired with the importance of the correction of names. Practically “name rectification” is the standardization of terms. The definition of the word “standard” usually refers to the uniform regulation of repetitive things and concepts (Chu et al., 2010), or a criterion or principle by which something is judged, or with the help of which a decision is made. The application and transmission of terms are characterized by repetition, so there is a need to lay down unified stipulations for terms. Chinese literary terms originate from different historical periods of the Chinese nation and span a long period with broad ideological and cultural resources. With special complexity the terms cannot be simply imposed but should be gradually standardized. It is impossible for people who are engaged in translation to experience other people’s experience or remold their mental world in translation, hence they can only understand the terms through the concepts and symbols used by others in constructing their own world and interpreting reality. Therefore, it is necessary to follow the translation norms and maintain consistency in international communication to position the standardization of terminology translation. Here it is intended to construct the *Term Corpus of Standardization of Translation of Chinese Literary Words* by following the sample of the national project work *Term Corpus of Standardization of Translation of Chinese Important Political Words* from *Term Corpus of Standardization of the Translation of Discourse System for Global Communication with Chinese Characteristics*. From the perspective of the practical particularity of term translations, translation is a selection process of naming the related concepts across two different languages. This selection is naturally affected by various factors such as the subject of translation and its social ecological environment. The accuracy of the previous translation of Chinese literary terms will directly affect the authenticity and effectiveness of the Chinese cultural image. In view of this, the standardization of terminology translation should focus on rectifying traditional views and taking measures for thorough-going reform.

Specialized authorities for the translation of literary terms have not yet been established. Therefore both researchers and translators paid less attention to the terminological characteristics in the translation of literary terms, and they tended to pay more attention to the principles of translating terms rather than the process of naming the terms, which resulted in the great arbitrariness and the lack of normalization in the translation of literary terms (Qiu, 2017). Given the current situation and problems in the translation of literary terms, the most effective way to standardize the translation of literary terms is that the authority claims the translation of specific terms in a standardized way. On the one hand, national measures should be taken to carry out a more systematic and comprehensive examination and scientific standardized management for the current existing terms. Also, overall plans have to be worked out in the construction of the English translation system of Chinese literary terms and use the English translation system of Chinese literary terms standardly according to the cultural traditions and habits, which is of great significance to the international transmission of Chinese literary terms with their true nature as they are the gene symbols of Chinese culture and way of thinking and behavioral norms. For example, the English translation of terms in the quartering method of Chinese literature translation causes damage and deficiency. In ancient Chinese prose, there was a classification of *Wen* and *Bi* in Pinyin, and the overall classification of prose was divided into rhyme and prose, which was not found in the classification of English prose. This phenomenon can be avoided by employing standardized forms to refer to specific terms in translation.

On the other hand, the English translation of Chinese literature is endowed with the mission of spreading culture under the background of Chinese culture's going global actively. However, the English translators of Chinese literature in the English world are numbered. According to Howard Goldblatt, a famous American Sinologist and arguably the most important translator of Chinese literature in the English-speaking world, there are only two people who are committed to translating Chinese literature in the English-speaking world: one is himself, translating Chinese novels, and the other is John Balcom who is translating Chinese poetry. Other translators are either enthusiastic but inexperienced graduate students with heavy academic work or teachers at colleges and universities who take on translating occasionally with more of their attention attracted in other work (Goldblatt, 2000). Therefore, native translators are duty-bound to change the situation and construct favorable circumstances. The translation of literary terms involves many disciplines of translatology, terminology, stylistics, literary history, semiotics, and linguistics, which is an exact example of an interdisciplinary within the trend of the new liberal arts. There is an urgent need to strive for the disciplinary system of literary terms translation and carry out terminology education for translation majors at colleges and universities hoping to make up for the translation of Chinese literary terms in the field of humanities which has been long neglected. More translators, terminologists, and researchers in the field of literature are expected to participate in academic research on the naming of literary terms. In this way, translators can take the national translation resources of literary terms such as a literary terms dictionary as the



standardized translation or translation criteria and combine this with the professional background of terminology as guidance for translating Chinese literary terms in a unified mode. If a newly formed word or uncommon word of literary terms cannot be found in authoritative terminology dictionaries, and there is no ready-made translation name to consult, native translators need to fully mobilize their knowledge resources to trace the concept of the term. While fully grasping its concept connotation, they also need to consider other related concepts in the terminology system to maintain the original cultural characteristics of the term to the maximum and convey its cultural connotation. Because if readers in English-speaking countries do not understand the Chinese literary terms, there is no way for them to understand the thoughts of Chinese literature. Here terms are the scaffold of their thoughts (Gao, 2011).

We attempt to construct Chinese-English by standardizing Chinese literary terms systematically. The bilingual library *Chinese-English Library of Chinese Classics* (hereinafter referred to as the Library) is the largest translating and publishing project since the publication of Chinese-English translation works began. Many scholars and researchers have spared no efforts to finish the Library for more than ten years. Although the main tasks for the translation of the series of books have been completed, the target language, as the historical task of Chinese-English construction, is far from being completed. The language of the translated English texts in *The Chinese-English Library of Chinese Classics* should at least have two historical functions: appropriate expression of the thoughts, emotions, and customs of the traditional Chinese classics in the Library to promote the classics of traditional Chinese culture and the construction of the foundation of Chinese English and its independent position in English. Configuration, construction, and consolidation of this foundation entail continuing investigation and research, and furthermore, there is no doubt about its significance to Chinese international exchanges and global familiarization with Chinese culture. An observation and analysis of cases in current Chinese English and a reference of the generation and development of British English, American English, Chinese English, and others, can prove the feasibility of constructing Chinese English with *The Chinese-English Library of Chinese Classics* as the foundation, and the conduciveness to the establishment of a vocabulary of expressions as a demonstration of the basic characteristics and imagery of traditional Chinese culture. Meanwhile, the Library will provide a new approach to the study and development of theory and practice of Chinese-English translating (Fu, 2012).

Finally, it is necessary to promote the “Thick Translation” (Appiah, 2004) and improve the terminology awareness and comprehensive quality of translators. Thick translation, a common method used in translation practice, can be traced back to Thick Description theory of Cultural Anthropology and historical contextualization theory of New Historicism, which was proposed by Ghanaian American scholar Kwame Anthony Appiah in 1993. However, as a strategy or method of translation practice, Chinese translator Yan Fu had applied this to translation practice long ago. The Thick Translation refers to an academic translation, a translation that tries to place the text in a profound linguistic and cultural background with annotations and accompanying



footnotes (Appiah, 2004). It happens that there is a similar case. Cao Minglun (2012) mentioned “literal translation annotation” and “supplementary compensation” when he talked about cultural transplantation and information compensation in translation, which are essentially the same as the Thick Translation. Cao (2013) holds that the means of the Thick Translation is to put the text in its linguistic and cultural background, that the purpose of Thick Translation is to make the original text more transparent and that the criteria or standard of Thick Translation is to value the fact and the style of the original works and keep the original meaning. Due to the particularity of the translation of literary terms, translators should be impressed by the need for more professionalism based on historical and cultural literacy and the terminology awareness in the new era of translation. Only in this way can Chinese translators play a better role in the practice of international cross-cultural communication and can Thick Translation become a truly effective translation method. Obviously, translators will be hindered by the lack of historical and cultural literacy and it will be difficult for them to put the translated text in the relevant historical and cultural context if they do not delve deeply into the relevant historical and cultural context. Therefore, it is necessary to set up relevant assessments in China’s MTI (Master of Translation and Interpreting) training programs. Relevant terminology education courses can be offered to students to provide opportunities of terminology translation practice to help cultivate translators’ terminology awareness and improve their capability comprehensively.

## **Conclusion**

The standardization of terminology translation with Chinese characteristics is the premise and foundation of effective international communication of discourse with Chinese characteristics. As an important part of the discourse with Chinese characteristics, the interpretation and standardization of Chinese literary terms is beneficial to ensure the standardization and unification of the output of “Chinese knowledge” discourse resources for the global expression of “Chinese knowledge.” Literary terminology is the core element through which we promote the development of cross-language literary communication and literary theory research. However, the weak interlingual commonality and the influence of many objective factors in the history and reality of Chinese literature result in the slow development of translation and communication. Taking the English version of the collection of Chinese literary works, the history of Chinese literature and the translation of literary terms in Chinese English dictionaries as examples, this paper illustrates that the translation of Chinese literary terms has experienced four variation methods; transliteration dominated by Wechsler Pinyin, Pinyin together with additional explanations, literal translation, and the application of Western academic terms. Focusing on the principle of maintaining the independence of native cultures, we put forward four measures for the current translation of Chinese literary terms. We place high hopes for systematically and comprehensively examining and regularizing the translation of literary terms.

This research advocates the disciplined establishment of literary terms translation and fully developed terminology education for translation majors at colleges and universities to regularize Chinese literature terms systematically and scientifically based on the Library. Furthermore, the theory of Thick Translation is expected to apply to the practice comprehensively. Finally enhancing translator's terminology awareness and literary attainments will ensure that native translators will keep the original meaning of the text. All these measures are aimed at solving the practical problems in the translation of literary terms more effectively and promote the process of standardization for the translation of literary terms. We should adhere to the principle of localization of Chinese literary terms and do our best to maintain the independence of Chinese literary terms in a Chinese context in the process of translation across heterogeneous cultures. Meanwhile native translators may break some rules creatively to strive to be true to the nature of Chinese literature and interpret the profound connotations of Chinese culture for the English world, which is conducive to the enhancement of Chinese cultural identity and cultural self-confidence. For one thing it is helpful for Chinese literature to promote the engagement in international communication positively, and for another it is better for Westerners to understand Chinese thoughts comprehensively to promote the construction and enhancement of the discourse system for global communication with Chinese characteristics innovatively.

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(Editor: Gerald)

# Fractal Analyses Reveal the Origin of Aesthetics in Chinese Calligraphy

Di Baofeng

Sichuan University

Luo Maoting

Sichuan University

Shi Kai

Jishou University

Liu Chunqiong

Jishou University

Jiao Yang\*

Sichuan University

**Abstract:** Chinese calligraphy is a thousand-year-old writing art. The question of how Chinese calligraphy artworks convey emotion has cast its spell over people for millennia. Calligraphers' joys and sorrows were expressed in the complexity of the character strokes, style variations and general layouts. Determining how Chinese calligraphy aesthetic patterns emerged from the general layout of artworks is a challenging objective for researchers. Here we investigate the statistical fluctuation structure of Chinese calligraphy characters sizes using characters obtained from the calligraphy artwork "*Preface to the Poems Collected from the Orchid Pavilion*" which was praised as the best running script under heaven. We found that the character size distribution is a stretched exponential distribution. Moreover, the variations in the local correlation features in character size fluctuations can accurately reflect expressions of the calligrapher's complex feelings. The fractal dimensions of character size fluctuations are close to the Fibonacci sequence. The Fibonacci number is first discovered in the Chinese calligraphy artworks, which inspires the aesthetics of Chinese calligraphy artworks and maybe also provides an approach to creating Chinese calligraphy artworks in multiple genres.

**Keywords:** Chinese calligraphy, Preface to the Poems Collected from the Orchid Pavilion, fractal analysis, Fibonacci number, aesthetics

**DOI:** <http://dx.doi.org/10.19873/j.cnki.2096-0212.2021.02.002>

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\* Di Baofeng, College of Architecture and Environment & Institute for Disaster Management and Reconstruction, Sichuan University; Luo Maoting College of Architecture and Environment & Institute for Disaster Management and Reconstruction, Sichuan University; Shi Kai, College of Biology and Environmental Sciences, Jishou University; Liu Chunqiong, College of Biology and Environmental Sciences, Jishou University; Jiao Yang, College of Arts, Sichuan University.

The work is funded by the National Natural Science Foundation of China (No. 41465010, 41977245).

The authors express their sincere thanks to Professor Li Houqiang, Professor Earl Bossard, Professor Carla Bossard for comments.

Correspondence concerning this article should be addressed to Shi Kai, College of Biology and Environmental Sciences, Jishou University, Hunan. E-mail: einboplure@163.com.

Chinese calligraphy, with its artistic and linguistic values, has been admired by people for thousands of years (Gaur, 1994). During this time, people have been contemplating the question: How Chinese calligraphy, as the main representative of China's ancient civilization, conveys art aesthetics, thoughts and feeling (Burckhardt, 2009, pp. 124-126).

The understanding and appreciation of Chinese calligraphy is focused not only on Chinese character recognition but also on its forms of aesthetic expression, such as the character topology styles, general layout and spatial arrangements (Ouyang & Fong, 2008). The different styles of each calligrapher gave birth to a variety of multiple genres (Burckhardt, 2009, pp. 124-126; Ouyang & Fong, 2008). In the Artificial Intelligence (AI) field, it is valuable to program a computer to appreciate and generate the beautiful calligraphic artworks, and it will enhance the optical character recognition, artistic creation, restoration of ancient calligraphic artworks and more (Li, Song & Zhou, 2014, pp. 299-305). The quantitative analyses of aesthetic expressions of artworks is the cornerstone of this AI field. In recent years, achievements in analyzing the manifestations of artworks, such as music and paintings have been realized by using mathematical analyses (Serrà, Corral, Boguñá, Haro & Arcos, 2012, pp. 485-487; Hsu & Hsu, 1990, pp. 938-941; Mureika, Dyer & Cupchik, 2005; Lyu, Rockmore & Farid, 2004; Taylor, Micolich & Jonas, 1999). The art in Chinese calligraphy is presented thoroughly and vividly so that its structure can be seen instantly, generating an impression in our minds. However, compared with other art forms such as music and paintings, the analysis of Chinese calligraphy is difficult owing to the complex Chinese character topology and the large number of Chinese characters (Li, Song & Zhou, 2014, pp. 299-305; Zhang & Zhuang, 2012). Attempts to imbue computers with the ability to grade and create calligraphic artworks have been rare because of the complexity of Chinese characters (Li, Song & Zhou, 2014, pp. 299-305). Little research has been done on the basis of mathematical analyses to quantitatively discuss its aesthetic expressions, especially the general layouts and spatial arrangements.

We investigated the calligraphy work *Preface to the Poems Collected from the Orchid Pavilion* which was praised as the best running script under heaven. It is the most important handwriting work of a great calligrapher named Wang Xizhi (303-361), created during the Eastern Jin Dynasty (317-420). However, the original copy was lost during the Tang Dynasty (618-907). Among all the facsimile copies, one copy, with the length of 24.5cm and width of 69.9cm, called the *Shenlong* Version, created by a calligrapher named Feng Chengsu (617-672) during the Tang Dynasty, is the most renowned. This artwork consists of 28 columns with 324 characters. For over one thousand years, many research findings have been achieved with respect to its history, calligraphy, literary ideology, etc. Its overall layout structure, as a key component of the work, remains a mystery to be explored in multiple genres. Producing an outstanding calligraphy artwork, with various stroke shapes, requires many skills. However, the stroke shapes are not the only sources for the aesthetic perception of calligraphy works. For example, when people are appreciating the calligraphy work of *Preface to the Poems Collected from the Orchid Pavilion* feelings of softness and fluency are also created. Such calligraphy has been described as: "The dragon jumping over the heavenly gate and the tiger lying in the watchtower of the

phoenix” (Ouyang & Fong, 2008; Alsop, 1982; Yee, 1974; Robinson, 1995). These mysterious feelings, mainly subjective, relate to every character in the calligraphy. The question was: Could people manage to describe and capture such mysterious feelings in a quantitative way? The answer seems to be yes. By exploiting the fractal method in a time series, we have unveiled several macroscopic statistical patterns and aesthetics characterizing this calligraphy artwork.

## Methods

### Materials and Data Extraction

The Chinese characters have some formal square structures. In Chinese calligraphic artworks, in order to pursue the aesthetic perception, calligraphic characters were often produced to show an inclination of being spiritually round with the specified round stroke representing and writing trajectories. Moreover, with the aim of pursuing the overall beauty of character shapes, Chinese calligraphy characters are not of uniform size in some artworks. That is “square in shape, round in inclination; spirit in square, and round in form” (Kang, 2006). Thus, in Chinese calligraphy, handwriting and composition merge in the idea of combination and complementation of squares and circles. Considering the importance of font size in general layout, we ignored the stroke shapes of each character and encoded the Chinese calligraphy code word’s dataset.

Based on units of squares and circles, the areas of the 324 characters were measured in the facsimile copy by the actual length scale of *Preface to the Poems Collected from the Orchid Pavilion* based on spatial georeferencing respectively. The traditional Chinese characters are written from right to left and from top to bottom. By the corresponding square and circle units, these characters area data with word order are shown in Figure 1 respectively.

### Detrended Fluctuation Analysis

To demonstrate the existence of a correlation, the detrended fluctuation analysis (DFA) (Penget al., 1994, pp. 1685-1689), a benchmark method to quantify long-term correlations, was used. The fluctuation function  $F(l)$  at the special scaling  $l$  of a time series follows a power-law relation, where  $F(l) \propto l^\alpha$ . When  $\alpha=0.5$ , corresponding to the uncorrelated time series, the larger (or smaller)  $\alpha$  indicates long-term correlation (or anti-correlation).

### Box-Counting Technique

The fractal dimension ( $D_B$ ) can quantify the scaling relationship between the patterns observed at different magnifications (Lyu, Rockmore & Farid, 2004; Taylor, Micolich & Jonas, 1999). For Euclidean shapes,  $D_B$  is the integer value. For example, for a smooth line,  $D_B=1$ ; while for a filled area,  $D_B=2$ . However, fractal shapes,  $D_B$  have a non-integer value.  $D_B$  value can be determined by the well-established “box-counting” technique. When one covers an object with a grid of square



boxes of size  $L$ , the number of occupied squares is  $N(L) \propto L^{-D_B}$ . In fractal geometry, the power law generates the scale invariant properties.

## Results and Discussions

### Statistical Patterns of the Data

We found that the cumulative distribution of these area series could be matched to a stretched exponential distribution,  $P(S) = A \cdot \exp[-B \cdot (S/R_S)^C]$ . Wherein  $P(S)$  is the cumulative probability distribution of the circle,  $S$  is the area,  $R_S$  is the mean area, and  $A$ ,  $B$  and  $C$  are the fitting parameters. For the circle and square areas series,  $C_c=3.605$  and  $C_s=3.517$  respectively. These results are shown in the Figure 1. This statistical distribution has been found both in natural and social phenomena, such as climate records (Bunde, Eichner, Kantelhardt & Havlin, 2005), Internet traffic (Cai, Fu, Zhou, Gu & Zhou, 2009) and financial markets (Wang, Yamasaki, Havlin & Stanley, 2006). The stretched exponential distributions of the series suggest the existence of correlation in this calligraphy.

The calligraphy artwork *Preface to the Poems Collected from the Orchid Pavilion* (The Palace Museum, 24.5cm×69.9cm) was showing in the upper inset. In the bottom left corner, we found that the fluctuations in the characters area data corresponding square and circle units. In the bottom right corner, the cumulative distribution of these area series could be fitted by a stretched exponential distribution.

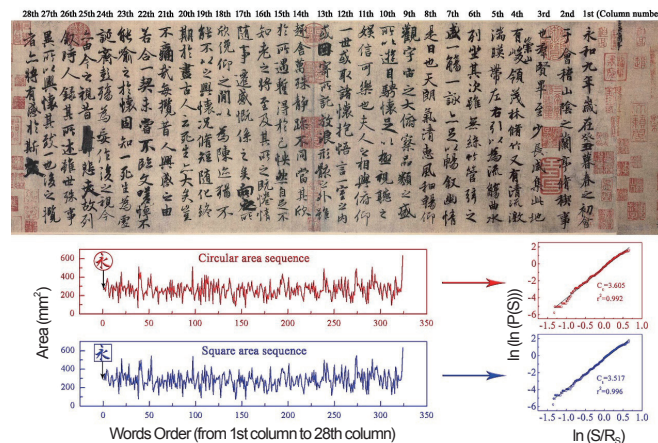


Figure 1 Schematic diagram showing the cumulative distribution of characters area data in the calligraphy artwork *Preface to the Poems Collected from the Orchid Pavilion*.

### The Relationship Between Long-term Correlations and Human Emotion

The single scaling exponent  $\alpha$  calculated over the whole series is not informative regarding the evolution of the correlation structure. Within all 28 columns of characters in the *Preface to the Poems Collected from the Orchid Pavilion*, we considered a sliding window consisting of six columns of characters and calculated the local  $\alpha$  parameters. The number of datasets in each window was chosen to provide a sufficient number of points to perform the estimates. The shift between two successive windows was set 1 column. The reckoning is shown in Figure 2 that the correlation structure in the 16<sup>th</sup> column changed abruptly. Before the 16<sup>th</sup> column, there is an

anti-correlation feature ( $\alpha < 0.5$ ), namely when the previous character is bigger, the following character is smaller. After the 16<sup>th</sup> column, there is a long-term correlation feature ( $\alpha > 0.5$ ). Here the size of characters presented a continual rule.

The local correlation characteristic was reflected by the single scaling exponent calculated by the detrended fluctuation analysis. The sliding window consists of six columns of characters. The shift between two successive windows was set 1 column.

### Fractal Analysis of the Artwork

The left insets of Figure 3 (a) and Figure 3 (b) reflect the box-counting analysis of the whole circle and square areas series respectively. The transition between two power-law processes is almost equal to the mean of each character's area. At smaller spatial scales,  $D_{C2} \approx 1$  (circle) and  $D_{S2} \approx 1$  (square), reflecting the linear section of the curve fluctuation diagram. While at larger spatial scales,  $D_{C2} = 1.642$  (circle) and  $D_{S2} = 1.652$  (square), which reflect the scale invariant properties. Furthermore, we considered a sliding window with six columns of characters and calculated the local  $D_B$  parameters. The probability density of  $D_B$  values is shown in Figure 3. For circles, the mean value of  $D_B$  value  $\overline{D_{C1}} = 1.624$ , while for squares,  $\overline{D_{S1}} = 1.618$ .

In the left insets of (a) and (b), the box-counting analysis of the whole circle and square areas sequences were provided respectively. The breaks all occur at about  $\lg(L) = 2.5$ . The local fractal dimension ( $D_B$ ) parameters with a sliding window with six columns of characters were calculated. The probability density of the local  $D_B$  values of circle and square areas sequences is shown in (a) and (b) respectively.

### Discussions

We concluded that the spatial distribution pattern for the size of characters is not random. In

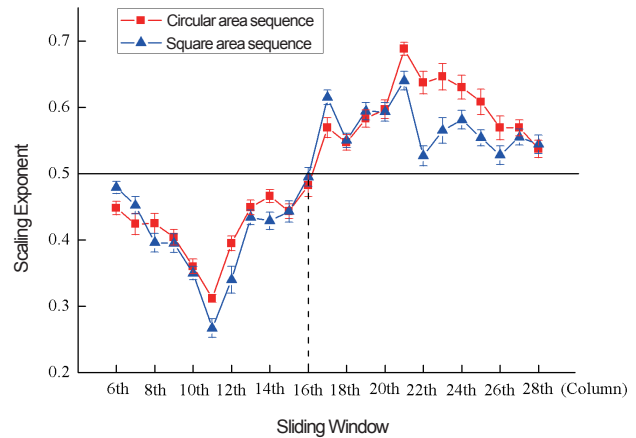


Figure 2 The evolution of the correlation structure in the Preface to the Poems Collected from the Orchid Pavilion

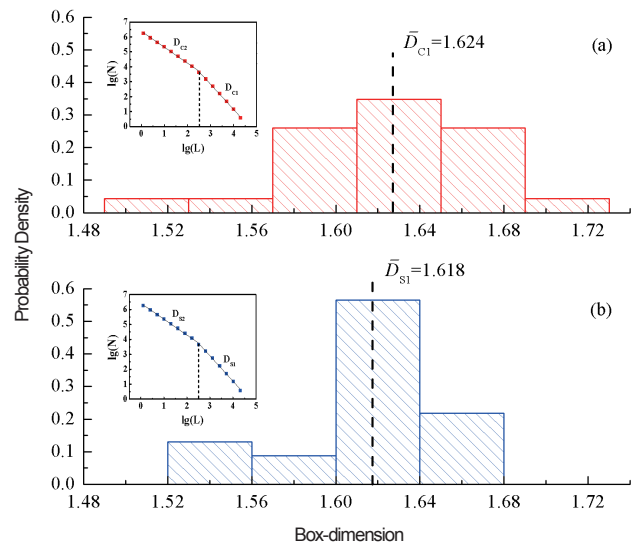


Figure 3 Box-counting analyses of the fluctuation curve in characters area data.

the uncorrelated time series, a Poisson distribution, as  $\lg[P(S)] \propto -x$ , is expected (Bunde, Eichner, Kantelhardt & Havlin, 2005). We considered that when the calligrapher was creating this work, his feelings could be flexible, which gave rise to the changing in size of the characters. As a result, the local correlation structure is supposed to change during the creation of this work, and the change revealed that the feelings of the calligrapher changed during the process of creating the art work. At the beginning, the calligrapher might be cautious in order to keep the balance of the whole art work. When the former character was bigger, the following character was smaller (anti-correlation feature). Later in the creating period, the author might enter a free state with less care regarding the size of characters but more focus on the consistency of the whole work. That is the long-term correlation.

The size change of characters was more inclined to reflect expressions of the calligrapher's complex feelings. Too simple or too complex a change was likely to be irritating. The secret to creating an outstanding calligraphy work is to balance the predictability. Calligraphy work at the same time is literature work. When we read through the work, we understand when the author's emotion rises and falls but we do not always notice the size change of characters. Our brain tends to predict what comes next. Due to the unique individual perception of the calligraphy, some expectations are matched while others seem to be ignored. An experienced calligrapher rewards part of our expectations to keep us attracted, while delicately violating the other expectations. This is the fundamental reason why a calligraphy work looks smooth and consistent within one breath.

Human emotions are the decisive element for the style of the whole piece, while calligraphers' unique writing skills decide every structure of each character. The means of fractal dimensions of the whole circle and square areas series were close to the Fibonacci sequence. This is an exciting outcome. Fibonacci numbers have been applied to various artistic works in various forms, including the paintings of Leonardo da Vinci. But its application has been never previously found in Chinese calligraphy. The Fibonacci sequence endows *Preface to the Poems Collected from the Orchid Pavilion* with geometry and aesthetic beauty.

## Conclusions

In summary, with the fractal method in a time series, a natural bridge between the quantitative analysis and Chinese calligraphy has now been built. The Fibonacci sequence has been discovered in the Chinese calligraphy artworks, which provides aesthetics to Chinese calligraphy. This study presented an approach to understanding the beauty of Chinese calligraphy, and could provide assistance for the application of AI techniques to create Chinese calligraphy artworks in multiple genres.

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(Editor: Gerald)

# *The International Profile of Chinese Visiting Scholars in the UK: Improvement Needed in Linguistic, Cultural, and Academic Confidence*

Zhang Rui

Xi'an International Studies University

**Abstract:** This study used Chinese visiting scholars in the UK as a sample, discussed Chinese visiting scholars' cross-cultural adaptation from the perspectives of linguistic confidence, cultural confidence and academic confidence, analyzed the correlation among the three types of confidence, and then proposed the concept of establishing a positive international profile of Chinese visiting scholars. It was recommended that Chinese visiting scholars should make more improvements in their cross-cultural adaptation. They should become the representative of China's international image, and play a more active role in further internationalizing of Chinese higher education.

**Keywords:** Chinese visiting scholars, international profile, linguistic confidence, cultural confidence, academic confidence

**DOI:** <http://dx.doi.org/10.19873/j.cnki.2096-0212.2021.02.003>

**W**ith the strategic development of higher education internationalization in China, Chinese higher education is moving forward even more rapidly and steadily. As the internationalization of faculty is the core of Chinese higher education internationalization (Chen & Liu,

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\* Zhang Rui, MOE Training Department, Xi'an International Studies University.

This article was funded by China Scholarship Council, CSC No: 201800230006.

Correspondence concerning this article should be addressed to Zhang Rui, MOE Training Department, Xi'an International Studies University, Xi'an. E-mail: [rainzhangrui@xisu.edu.cn](mailto:rainzhangrui@xisu.edu.cn).

2011), more and more Chinese scholars, mainly university teachers, have been provided with chances to study and visit abroad, especially in well-developed Western countries. Since the establishment of the China Scholarship Council (CSC) in 1996, an increasing number of Chinese scholars have been selected and sent abroad annually for academic exchanges (CSC, 2010). In 2018 alone a total of 27,392 people were sponsored by CSC to study abroad, among whom 70 percent were senior scholars, visiting scholars, post-doctoral scholars or doctoral students, and 77 percent of them went to the US, the UK, Canada, Germany, France, Russia, Australia, Japan, etc. (Sheng, 2019). Given the number of scholars sponsored by other funding agencies and institutions and self-funded scholars, there are a great number of Chinese scholars going to different countries all over the world every year.

Returning scholars have exerted significant influence on the reform of traditional disciplines, the establishment of new disciplines, and the improvement of the quality of teaching and personnel training. They have contributed to the remarkable progress of domestic scientific research, further narrowing the gap between the research level in China and the international level. While spreading Chinese culture to the world through their academic exchanges, they have also brought about economic benefits for China by undertaking international programs and the applications of their research achievements (CSC, 2010).

### **Previous Studies on Visiting Scholar Mechanisms**

As a result of the rapid development of the visiting scholar programs in China, both accomplishments and problems related to the mechanisms involved have been observed. Several studies discussed the merits, problems and barriers reflected in the cooperative process between Chinese visiting scholars and the host universities. By using the case of Chinese visiting scholars at a university in Canada, Miller and Blachford (2012) explored how fostering collaboration among Chinese visiting scholars, the host university and the community enhanced internationalization, and put forward a partnership model connecting the interests of the university, international visiting scholars, and the local community by emphasizing mutual benefit, shared learning, cross cultural understanding, collaboration and sustainability. Xue et al. (2015) studied Chinese visiting scholars' academic socialization in some universities in the US, and found that Chinese scholars employed strategies such as motivation, social networking development, academic recognition, goal orientation, and community involvement; meanwhile, their studies analyzed the reasons for Chinese visiting scholars' dilemmas like marginalization, time constraints, and external critiques. Li Y. X. and Li Z. S. (2018) discussed the reasons and motives for Canadian universities' acceptance of international academic visitors, and the challenging problems in their cooperation, gains from their cooperation and suggestions for future cooperation. According to Liu and Jiang (2015), before 2015, Chinese literature on Chinese faculty studying abroad mainly focused on policies and management issues. The two researchers found that there were few empirical studies on the experiences



and outcomes of the returning Chinese visiting scholars, so they did a systematic investigation into the challenges facing Chinese visiting scholars and the gains made by them and came to the conclusion that visiting scholar programs should be viewed as a crucial approach to the professional development of faculty and be incorporated into a comprehensive package for Chinese university faculty (Liu & Jiang, 2015). Since then, more researchers have conducted various surveys among Chinese visiting scholars, mainly about their gains from the overseas experience. Jiang and Liu (2015) pointed out in another paper that Chinese visiting scholars had achieved considerable internal and external outcomes through their overseas experiences in terms of changes in values, improvement in teaching and research practices, and enhancement of international academic cooperation. Similar results can be found in another paper which demonstrated that overseas faculty training could bring direct and indirect benefits in faculty attitude, teaching, research, and service (Ma & Wen, 2016). Huang et al. (2016) proved that there was a significant positive correlation among the motivation, procedures and effects of the overseas visiting scholar programs, and suggested China should enhance the correct motivation, strictly monitor the applications, expand the scope of cooperation, and continue to increase the investment. Zhao et al. (2018) discussed and analyzed visiting scholars' practical obstacles: Preparations before leaving the country were complicated and time-consuming; the external drive to visit foreign countries was too strong while internal motivation was insufficient; the level of enthusiasm for academic cooperation between Chinese scholars and their foreign mentors differed; procedural supervision did not show substantive meaning; social and cultural differences negatively affected endogenous academic pursuits; diffusion mechanisms after returning from visits were not effective.

While most of the studies mentioned above concluded that Chinese visiting scholars had indeed achieved beneficial outcomes from their academic visits and studies abroad, some also pointed out that Chinese scholars' lack of English proficiency and cross-cultural knowledge hindered the cooperation between them and their foreign mentors (Li & Li, 2018; Liu & Jiang, 2015; Jiang & Liu, 2015; Xue et al., 2015). Few studies discussed Chinese scholars' own reflections on their academically adaptive barriers induced by an insufficient reservoir of language and culture, their mentors' feedback on the impact of their adaptive barriers on the academic cooperation, and how they could get rid of this dilemma and smooth the academic cooperation between them and their mentors in a context of cross-cultural communications. Although Liu C. (2016) discussed the profile of Chinese scholars as the interpreter of China's international image, the conveyor of Chinese culture, and the victim of the so-called "China threat" theory, the profile was drawn from the perspective of international media, rather than in a cross-cultural context closely related to Chinese visiting scholars' everyday overseas experience. Other than his discussion, few studies have drawn an overall international profile for Chinese visiting scholars in terms of their linguistic, cultural and academic capabilities in the host countries, through which scholars and professors in other countries could learn more

about Chinese visiting scholars and thus improve mutual understanding and further cooperation between Chinese scholars and their foreign mentors, as well as the host universities.

### Kim's Theory as the Theoretical Framework

Chinese visiting scholars' communication and adaptation in the host countries are a multidimensional procedure. As a result, it is necessary to apply a comprehensive and integrative theory to investigate their overseas experiences. Compared with previous theorists and researchers involved in intercultural communication and adaptation, Young Yun Kim used open-systems theory as an organizing framework and proposed a comprehensive theory of cross-cultural communication and adaptation based on a wide range of existing concepts, models, and research data derived from different disciplines (Qian, 2013). The theory incorporated an individual's communicative capability in accordance with the host communication system and his or her psychological and social interactions with the host environment. Kim went beyond the traditional linear-reductionist conceptions of adaptation and focused on its interactive, multifaceted, and evolving nature. Kim's theory, including three open-systems assumptions, three boundary conditions, 10 axioms, and 21 theorems, has so far been the most broad-based theoretical account of cross-cultural adaptation; it not only brought many conceptions together but also clarified the interrelationships among different conceptions. Kim's comprehensive theoretical framework can be applied to research into both long-term and short-term adaptation processes (Qian, 2013).

According to Kim's theory of communication and cross-cultural adaptation (2001, p. 5), once strangers entered a new culture, the cross-cultural adaptation process started and the strangers' habitual patterns of cognitive, affective, and behavioral responses experienced adaptive changes. Through the process, the strangers increased their proficiency in self-expression and fulfilled of their various social needs.

Kim proposed a process model to present the dynamic adaptation process of strangers (see Figure 1). She explained that stress, adaptation, and growth highlighted the core of strangers' cross-cultural experiences in a new environment, and that the three were closely correlated. Additionally, the stress-adaptation-growth dynamic worked not in a smooth, linear progression, but in a cyclic and continual "draw-back-to-leap" pattern, analogous to the movement of a wheel. Strangers responded to each stressful experience by

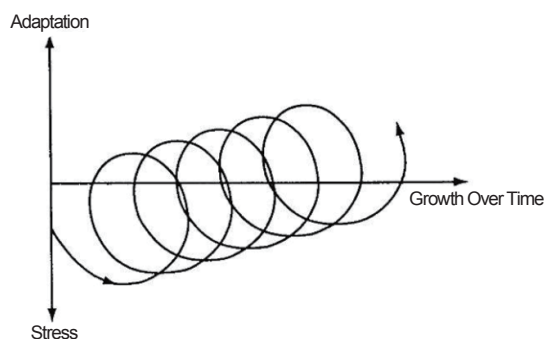


Figure 1 The stress-adaptation-growth dynamic: A process model (Kim, 2001, p. 57)

“drawing back,” which in turn activated adaptative energy to help them reorganize themselves and “leap forward” (Kim, 2001, pp. 3-4).

Kim further explained that over a long period of time, when strangers experienced certain internal changes, the fluctuations of stress and adaptation were likely to become less severe, resulting in internal calmness, indicating the strangers’ gradual adaptation to a new environment. As a result, the depiction of the stress-adaptation-growth dynamic could be modified to reflect a diminishing severity in its fluctuation over time (2001, p. 59) (see Figure 2). Kim added that not all individuals were equally successful in better adaptation. The degree of adaptation was dependent on an individual’s existing inner resources (2001, pp. 59-60).

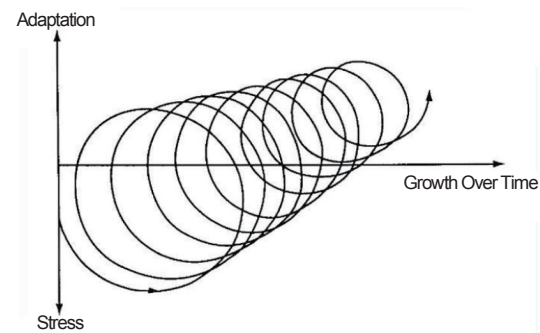


Figure 2 Diminishing stress–adaptation–growth fluctuation over time (Kim, 2001, p. 59)

Once Chinese visiting scholars enter a cross-cultural environment, they will encounter problems caused by their lack of language proficiency and cross-cultural knowledge, as indicated in previous research on Chinese visiting scholars. Kim’s focus on the importance of language and culture in the process of cross-cultural adaptation can be employed to explain Chinese visiting scholars’ underperformance in a foreign culture. By applying Kim’s theory of communication and adaptation as its theoretical basis, this study aims to determine how much Chinese visiting scholars’ inadequate language proficiency and insufficient cross-cultural knowledge influence their academic adaptation in a foreign university, and how they and their mentors perceive the communicative barriers caused by language and culture-related factors, as well as what they (should) do to improve their linguistic confidence, cultural confidence, and academic confidence. At the end of the study, an international profile of Chinese visiting scholars in the UK will be drawn based on previous discussions and analyses; also, it is proposed that all Chinese visiting scholars should bear in mind the concept of, and strive for the establishment of a positive international profile for Chinese scholars.

## Research Methods

A combination of quantitative research and qualitative research was employed in this study. Chinese visiting scholars who visited academic institutions in the UK were exclusively selected as the target population. With Questionnaire Star, a software tool for questionnaires widely used in China, a questionnaire survey was conducted among Chinese visiting scholars, and a total of 120 questionnaires were collected using WeChat and QQ as the media for investigation; excluding the questionnaires from non-visiting scholars, 106 of the 120 questionnaires were

valid. In order to obtain more accurate and reliable data, another small-scale questionnaire survey was conducted among Chinese visiting scholars who were visiting or had visited the University of York, and a total of 30 questionnaires were collected; excluding the questionnaires from non-visiting scholars, 27 of the 30 questionnaires were valid; also, face-to-face interviews were conducted with four professors at the University of York (Table 1), and a WeChat interview was conducted with six Chinese visiting scholars during their academic visits at the University of York (Table 2).

Table 1 Interviewees' Profiles (professors at UoY)

Interviewee	Gender	Educational Background	Academic Title	Discipline
Victoria Gould	F	Ph.D.	Professor	Mathematics
Helen Smith	F	Ph.D.	Professor	British Literature
John Dawson	M	Ph.D.	Associate Professor	Electrical Engineering
Ian Davies	M	Ph.D.	Professor	Citizenship Education

Table 2 Interviewees' Profiles (Chinese visiting scholars)

Interviewee (pseudonyms used)	Gender	Age	Educational Background	Academic Title	Institution Category	Sponsorship Category	Visiting Period	Discipline
Li	M	31	Ph.D.	Lecturer	Regular University	Institution- sponsored	One Year	Education
Jane	F	31	Ph.D.	Lecturer	211-project University	CSC- sponsored	One Year	Chemistry
Liu Ziji	M	30	Ph.D.	Lecturer	Regular University	Institution- sponsored	One Year	Ancient Chinese Literature
Kenneth	M	32	Ph.D.	Lecturer	Regular University	CSC- sponsored	Half a Year	Art
William	M	37	Ph.D.	Lecturer	Regular University	Institution- sponsored	One Year	Mathematics
Jiatong	F	35	Ph.D.	Associate Researcher	Research Institute	CSC- sponsored	One Year	Electronic Engineering

The data from the two questionnaires were analyzed and used to create a general outline of Chinese visiting scholars' cross-cultural adaptation in British academic institutions. The data collected from the semi-structured interviews with the four professors at the University of York (UoY) and the six Chinese visiting scholars helped to investigate the interactions and communication between Chinese scholars and their mentors more deeply. The essential features of Chinese visiting scholars' cross-cultural adaptation were derived and refined from a comprehensive analysis of the data collected from both the questionnaires and the interviews, and thus a brief international profile of Chinese visiting scholars in the UK was established. Suggestions for improving Chinese visiting scholars' general international profile were provided after a systematic analysis of all data.

## **Chinese Visiting Scholars' Linguistic, Cultural and Academic Confidence**

### **English Proficiency and Relevant Problems**

As proposed by Richard Clément, linguistic self-confidence is a powerful mediating process in a multicultural setting that affects a person's motivation to use the language of another speech community (Wong, 2015).

As a result of the typical way of English teaching in China, which focuses mainly on students' grammar, reading and writing, but pays less attention to listening and speaking, most English learners in China are good at English reading and writing, but poor in listening and speaking. To a great extent, English is no longer considered as a communication tool but viewed as a survival skill for job-hunting or promotion in China (Ye, 2008). The older people are, the more obvious this phenomenon is among them. Since Chinese visiting scholars are mainly aged from 30 to 45, they are a generation deeply influenced by the typical Chinese way of English teaching. In the questionnaire survey, 15 of the 106 Chinese scholars were English majors, marked by a comparatively higher level of linguistic confidence. By contrast, the situation among the 91 non-English majors was a different picture: Many of them (57.14 percent of the 91) admitted that their listening and speaking were not as good as their reading and writing. The situation was more or less the same among the 27 Chinese visiting scholars who visited the University of York. Among the six Chinese scholars involved in the WeChat interview, most were not confident with their listening and speaking, but had more confidence in their reading and writing.

On the part of their mentors, the situation was not overly optimistic, either. According to Victoria Gould, many people in China have been taught to read and write in English quite well. However, it can be hard for some of her Chinese visitors to understand the spoken word. It might be the way in which native speakers speak English; presumably the tone and the way of speaking are so different from what people learn in China.

John Dawson mentioned that quite often his Chinese research visitors did not understand him while he did not always understand them either. Ian Davies summarized from his communication with several Chinese scholars he had hosted that the older the scholars, generally the more difficult it was to communicate with them.

Obviously, Chinese visiting scholars' inadequate English proficiency, especially their listening and speaking, hinders their daily cross-cultural communication in the UK, and the problem seems even more serious when they participate in academic communication and exchanges. According to Vitoria Gould, a person's language proficiency is crucial in academic exchanges.

Since academic activities are mainly conducted in the form of lectures and seminars, it is a great challenge for most Chinese visiting scholars to fully understand and then articulate

their personal viewpoints; even the English majors in the questionnaire survey were not very confident with their English in academic exchanges. As was pointed out in one study on the internationalization of college teachers in China, the overall level of Chinese college teachers' English proficiency was not very high, and from the perspective of scientific and academic exchanges, this problem would lead to unbalanced communication and collaboration between Chinese scholars and Western scholars, making it difficult to realize academic internationalization in China's higher education (Chen & Liu, 2011). From the questionnaire surveys, nearly half of the Chinese visiting scholars (48.11 percent of 106; 44.44 percent of 27) agreed that their lack of linguistic confidence negatively influenced their academic confidence.

According to Kim's cross-cultural adaptation theory, host language competence is the primary agent of socialization with which individuals can approach the host culture and pursue personal and social goals (Kim, 2001). For most Chinese visiting scholars, however, due to insufficient linguistic competence, they were unable to get involved in a meaningful way in a cross-cultural academic environment; thus, it was little wonder that most Chinese visiting scholars encountered obstacles such as marginalization and did not have a sense of belonging during their academic visit in a foreign country (Xue et al., 2015).

### **Strategies for Improving English Proficiency**

The use of positive intercultural communication strategies will serve to minimize the level of anxiety and enhance linguistic self-confidence (Wong, 2015). It was only through extensive and continuous exposure to, and participation in host social processes that individuals were able to develop a deeper understanding of the pragmatics of the host language (Kim, 2001). In the questionnaire survey among the 106 Chinese scholars, more than half (52.83 percent) had a relatively strong desire to improve their English and practiced on certain occasions, and 15.09 percent had a very strong desire to improve their English and practiced whenever they could. All of the six interviewees said their English had improved noticeably through continuous academic exchanges and by communicating more with native speakers in their daily lives.

The greater the preparedness for change, the greater the host communication competence (Kim, 2001); the greater the adaptive personality, the greater the host interpersonal and mass communications (Kim, 2001). Despite the fact that inadequate English capacity negatively impacted Chinese visiting scholars' academic interactions with their mentors, they were always making great efforts to improve their English to smooth the intercultural communication. During their time in the UK, Chinese visiting scholars could always take advantage of the language environment to immerse themselves in English so as to improve their linguistic confidence and become more proficient in their cross-cultural adaptation.

### **Cultural Knowledge Reserve and Relevant Problems**

Confidence in native culture means a country or a nation fully confirms the value of their



own culture and has a firm faith in the vitality of their own culture (Yun, 2011). Since cultural confidence primarily concerns proper attitudes towards culture and must be based on cultural consciousness (Xu & Chen, 2018), it is reasonable to conclude that confidence in a foreign culture should include a good command of corresponding knowledge and proper attitudes towards the foreign culture.

It is preferable to discuss Chinese scholars' confidence in both Chinese culture and Western culture as both factors have certain influence on Chinese scholars' cross-cultural communication and adaptation. In the questionnaire survey of the 106 Chinese scholars, 36.79 percent said their knowledge of traditional Chinese culture was not adequate, and more than half thought they knew about traditional Chinese culture comparatively well. As for their cross-cultural knowledge, while 33.96 percent of the scholars were relatively confident with their cross-cultural knowledge, more than half of the scholars thought they only had a limited amount of cross-cultural knowledge. Once cultural differences emerged, 26.42 percent of the 106 scholars said they would respect Western culture and admit the existence of cultural differences but would not accept Western culture voluntarily; while 73.58 percent thought they would also respect Western culture and could fully understand the cultural differences, preferring to selectively accept some Western culture.

From the data above, it was not difficult to summarize that Chinese scholars' cultural knowledge was not strong in general, whether of Chinese culture or Western culture; luckily, a great majority held an open mind towards Western culture and cultural differences. What is more, cultural differences indeed hindered the communication and interactions between Chinese visiting scholars and their mentors. For instance, due to a lack of cross-cultural knowledge of the two sides, the academic communication between John Dawson and his Chinese visitors sometimes really puzzled him, especially when he discovered that the visitors did not quite understand his points but still kept silent without asking him to explain in detail, let alone challenging his academic ideas. When the six Chinese visiting scholars involved in the interview were asked to comment on the phenomenon above, nearly all of them attributed it to the differences between Western culture and Chinese culture, with the latter advocating harmony and integration and paying great attention to holistic appeals such as unity, moderation, kind-heartedness, justice and harmony (Xu & Chen, 2018). Li (pseudonym) and William (pseudonym) said when they were in such a situation, they would first think over their mentors' views very carefully and deeply; Li thought he would not challenge his mentors because in his mind they were very authoritative in his research field, and William said he would not challenge his mentor unless he was absolutely confident with his own idea.

Kim (2001) summarized that cultural understanding helped individuals to share the native people's shared memory, to interpret underlying meanings, and to see how and why the native people communicated in the ways they did. From the instance discussed above, it was clear that most Chinese visiting scholars did not grasp enough cross-cultural knowledge; the dilemma

was that their traditional Chinese ways of doing things sometimes confused their mentors, but the Chinese scholars themselves did not realize this. Thus, it is quite reasonable to conclude that Chinese visiting scholars should command more cross-cultural knowledge in order to adapt better in a foreign country and achieve more academic outcomes. However, few people seemed to realize the importance of knowing more about Chinese culture and publicizing it when necessary. China has a long history characterized by one of the most ancient and unique civilizations in the world. Thanks to its rapid socio-economic development, China nowadays attracts more and more attention from the global community. Chinese visiting scholars are mainly the elite in their academic fields and the pillars of the nation. When they are sent abroad to study and work as academic visitors, they will enter a cross-cultural environment; to promote their cross-cultural adaptation and enhance the transmission of Chinese culture, they should know a great deal about both the host culture and traditional Chinese culture (Jiang & Zeng, 2012). Only in this way can they promote knowledge about China and Chinese people to other cultures; only when others know more about China and Chinese people, can better mutual understanding and smoother cross-cultural communication be realized and enhanced.

Nevertheless, the fact that cultural barriers to some extent block smooth academic exchanges between Chinese visiting scholars and their mentors cannot be ignored. The necessity that Chinese scholars should both increase their cross-cultural knowledge and learn more about traditional Chinese culture cannot be overemphasized. Otherwise, as it was stated in a previous study, not only did communication difficulties and breakdowns restrict Chinese scholars' involvement in academic socialization, academic cultural differences also limited their academic learning outcomes (Xue et al., 2015).

### **Strategies for Improving Cross-cultural Communication**

Culture and language are inseparable. The acquisition of cultural knowledge can not only stimulate one's enthusiasm in language learning, but also help promote deep understandings of cross-cultural communication. Thus, it is necessary to make comparisons between one's native culture and the host culture, and the purpose of doing so is not to decide which one is superior, but to identify the essential differences between them, thus achieving a profounder comprehension of the essence of each culture (Chen, 2006). Through this purposeful comparison between the native culture and the host culture, one would find it easier to adjust in a cross-cultural environment. The problem for most Chinese visiting scholars is that even though they are familiar with Chinese culture, it is difficult for them to express Chinese culture in English (Jiang & Zeng, 2012). Therefore, the key to this problem is that Chinese scholars should learn more of the English expression of Chinese culture while they are becoming more familiar with Western culture.

In addition, the establishment of cultural confidence is based on certain qualities like cultural tolerance, adaptability, and reflective capacity (Xu & Chen, 2018). To achieve better

cross-cultural adaptation, one of the prerequisites is that people should establish a good sense of intercultural awareness, not feeling inferior or arrogant when faced with cultural differences, but keeping an open mind to cultural differences and seeking common ground while reserving differences (Shen, 2019). Chinese visiting scholars should keep appropriate attitudes towards foreign cultures and reflect frequently and deeply on cultural differences.

### **Academic Adaptation**

The fundamental aim of the visiting scholar programs in China is to promote national modernization and internationalization, and a large-scale study conducted by Zweig et al. showed that the returnees were significant contributors to economic growth, technology, and skill transfer (Miller & Blachford, 2012). Meanwhile, a good number of studies in recent years also indicated that returning Chinese scholars gained both external and internal benefits from their overseas experience (Jiang & Liu, 2015; Ma & Wen, 2016; Huang et al., 2016). As discussed previously, although Chinese scholars' inadequate language proficiency and insufficient cultural knowledge exerted a negative impact on their academic adaptation, most Chinese scholars had acquired much from their academic visits abroad. This trend was consistent with Kim's cross-cultural adaptation theory, which held that an individual's cross-cultural experiences were characterized by stress, adaptation, and growth and that the stress-adaptation-growth dynamic did not function in a smooth, linear progression, but in a cyclic and continual "draw-back-to-leap" pattern (Kim, 2001). In spite of the fluctuations in Chinese visiting scholars' cross-cultural adaptation, they were indeed heading forward and making more achievements.

### **Cross-cultural Academic Exchange and Adaptation**

The academic communication between Chinese scholars and their mentors could be categorized into the following types: 42.45 percent of the 106 Chinese scholars conducted independent research; 28.3 percent could get academic supervision from their mentors when necessary; 15.09 percent cooperated with their mentors to carry out research; a small percentage (5.66 percent) could be supervised by their mentors throughout the academic visit and deemed that the mentor played a significant role in the entire research process; very few complained that they needed supervision from their mentors but were always ignored.

In the questionnaire survey, when asked to compare the academic atmosphere of their domestic institution in China with that of the host institution in the UK, most Chinese visiting scholars (89.63 percent of 106) were inclined to say that the host institution was marked by a better and stronger academic atmosphere. The six interviewees used modifiers such as "free", "clear", "lively", "strict", "rigorous" and "humanistic" to describe the academic atmosphere at the University of York, and they thought this kind of academic atmosphere helped faculty fully concentrate on academic research. Most Chinese scholars thought highly of their mentors'

academic capability. All the six Chinese scholars having a mentor at the University of York were highly impressed by their mentors' rigorous academic attitude and extraordinary academic capability.

When it came to their self-reported academic capability, 52.83 percent of the 106 Chinese scholars thought their capability was of a medium level; 40.57 percent thought their academic capability was relatively good and could conduct certain research; only 6.6 percent thought their academic capability was extraordinary and were able to conduct profound and complicated research. Clearly, most Chinese visiting scholars still had great potential for further academic improvement. This feature was meanwhile a striking reflection of the general profile of Chinese visiting scholars: Among the 106 participants, 70.75 percent were associate professors and 20.75 percent were lecturers, which indicated that they were in the rising phase of their academic career. Victoria Gould commented on Chinese visiting scholars' academic capability by using the word "mixed". The five scholars she hosted had been of a broad range of mathematical preparation and background.

In a cross-cultural context, it would be unavoidable for Chinese scholars to make comparisons between their foreign peers' academic capability and their own academic capability; they should be aware that many types of academic confidence are negatively influenced by people making upwards comparisons, and that low self-confidence and illusory inferiority can result in slower progress (Pulford et al., 2018). Therefore, Chinese visiting scholars should hold an objective view of their individual academic capability and employ active strategies to enhance their academic confidence. The more academic confidence they develop, the more they will be motivated to pursue greater academic achievements. When they are immersed in an environment with a stronger academic atmosphere marked by innovation and vitality, and with more rigorous mentors who possess better academic capability and abundant achievements, they will be assimilated academically.

After having been immersed in a good academic environment and impressed by their mentors' extraordinary academic capability, Chinese visiting scholars would be expected to build more academic confidence and better academic capability. Academic confidence is based on academic capability. Academic confidence is not only a question of how capable a scholar is in academic research. More exactly, it refers to an academic group's positive attitudes towards their own values and capabilities, and themselves as academic scholars (Cao, 2019). In a cross-cultural context, the exhibition of academic confidence in academic exchanges can be very complicated as an individual scholar's language proficiency plays a role in the exhibition process. Even though a scholar is highly confident in his/her academic capability in China, he/she would feel greatly discouraged and frustrated if limited language proficiency restricts the expression of their academic capability in the host university. What makes things worse is that according to relevant management regulations in some Chinese universities, to be promoted as associate professor or professor, one should have overseas study experience. As a result, many

scholars chose to go abroad because of external stimuli (Zhao et al., 2018), despite the fact that some scholars' English was not good enough or even disadvantageous to their academic capability in a cross-cultural academic environment. This phenomenon certainly had a negative impact on the exhibition of Chinese visiting scholars' general academic confidence on the international stage. In one word, in a cross-cultural context, linguistic capability becomes the medium of the exhibition of academic capability. The higher one's linguistic capability is, the easier it would be for one to show more academic confidence, and vice versa.

### **Chinese Visiting Scholars' Reflection on Their Academic Visit in the UK.**

Nearly all the participants in this study mentioned that they had achieved prominent outcomes in different aspects and on different levels. First of all, despite the fact that most of them were non-English majors and their English was not very good, most scholars found that their listening and speaking had become better as a result of practice during their academic stay in the UK. In this modern society characterized by globalization and internationalization, it is a definite trend for academics in countries where English was used as a second language to publish papers in the process of academic internationalization (Xu, 2014). For example, to build a world-class university, many universities in China require the faculty to publish more papers in international journals (Luo, 2014). Also, faculty's overall English proficiency is crucial for bilingual teaching in most Chinese universities in an effort to promote the development of internationalization (Liang, 2009; Li, 2011). As the driving force in China's higher education internationalization, university teachers, including most Chinese visiting scholars, are much clearer about the importance of English proficiency. Meanwhile, more Chinese visiting scholars are starting to realize the necessity of developing cross-cultural competence.

Chinese visiting scholars' academic involvement in the host academic department and university varied in terms of disciplines, the degree of independence, and their mentors' requirements. Scholars spent their time in the UK in different ways and gained different experiences from their academic visits. Certainly, the overseas experience influenced them to a great extent. According to this survey, the outcomes that Chinese visiting scholars achieved could be summarized into the following categories: international perspectives, new academic visions, rigorous academic attitudes, distinct research models, and management approaches. Also, Chinese scholars' living style, mental state and vision were different from those before. They obtained much from their academic stay in the UK, something tangible, and something intangible.

Just as was shown in Kim's modified Stress-Adaptation-Growth Dynamic (see Figure 2) (Kim, 2001), over a certain period of time, as Chinese scholars went through a progression of internal change, the fluctuations of stress and adaptation were likely to become less intense or severe, leading to an overall "calming" of the scholars' internal conditions. There were indeed ups and downs in Chinese visiting scholars' cross-cultural adaptation due to linguistic



and cultural problems, but they adapted to the cross-cultural environment and moved forward holistically.

### **The Establishment of a Positive International Profile of Chinese Visiting Scholars**

Owing to their overseas academic experience, most of the Chinese visiting scholars became the backbone in their domestic institutions and had great potential for development. From previous studies, both compliment and criticism could be found regarding the profile of Chinese visiting scholars. After all, most scholars worked very hard and achieved a lot during their overseas experience. They not only made great progress in their own career development, but also brought new ideologies, perceptions and thinking modes back to their domestic institutions. In the questionnaire survey, when it came to the concept of “establishing a positive international profile of Chinese visiting scholars,” 34.91 percent of them always paid a great deal of attention to their conduct and manners, and always remembered to establish a positive international profile of Chinese visiting scholars; 50.94 percent of the 106 Chinese scholars said that they paid some attention to their conduct and manners, trying to establish a positive international profile of Chinese visiting scholars; 9.43 percent paid attention to their own conduct and behaviors but did not sense the existence of this concept; 2.83 percent did not relate the concept to themselves; very few (1.89 percent) were only concerned about themselves. It is true that one visiting scholar cannot represent all Chinese scholars, but if many individual scholars do not behave like a scholar or do not do what a scholar should do, that would damage the international profile of Chinese scholars as a whole.

When asked about their impression of Chinese visiting scholars, the four professors at the University of York thought highly of Chinese scholars and were impressed by their diligence, devotion to work, courtesy, and easygoingness. Although being confused quite often by the cultural differences between himself and his Chinese research visitors and scholars, John Dawson said he enjoyed working with them. According to Helen Smith, Chinese scholars were very thoughtful, courteous, serious, and very keen to make the most of their time in the UK. That was her general impression. Gould said her Chinese visiting scholars had very good work ethics, who worked very hard and were always nice and studious.

Ian Davies made a relatively comprehensive comment on Chinese scholars and contributed some advice for improvement in Chinese scholars' international profile. He said that it was very easy to be with Chinese people because they were very quiet and respectful. But that easiness in many ways might suggest or reveal a lack of confidence. It was quite a subtle process of maintaining the very constructive and respectful approach which was wonderful. At the same time, they should be more proactive and show more initiative and critique.

As a result of both the influence of traditional Chinese culture and the fact that English was their second language, most Chinese visiting scholars were unable to fully show their



academic capability and confidence, which was a hinderance for the establishment of a positive international profile of Chinese visiting scholars in general. 55.66 percent of the 106 participants in the questionnaire survey agreed that linguistic confidence and cultural confidence could enhance academic confidence, but 66.98 percent found that their low level of linguistic confidence negatively influenced their academic confidence, and 24.53 percent found that their low level of cultural confidence negatively influenced their academic confidence. Linguistic confidence and cultural confidence cannot determine one's academic confidence, but can affect the exhibition of one's academic confidence. Moreover, as Ian Davies commented, Chinese scholars should be more proactive, both academically and culturally. To be specific, it is not enough for them to know more about Western culture and learn how to adjust to the Western environment; they should be clear that nowadays more and more people in the West also want to know more about China and Chinese culture. If scholars become more proactive, they will create more chances to publicize Chinese culture, so that intercultural communication would become easier and smoother.

Chinese scholars should also be more innovative. From the survey, more than half (57.55 percent) of the 106 scholars said that they were relatively innovative but could not put this innovation into practice. During intercultural academic communication, both sides would like to obtain something innovative, something enlightening, and something that they have not seen or experienced. It would not be a sensible choice for one to stick to the cliché, reporting what they have already seen and repeating what have been said to them. Just as Ian Davies said, some visiting scholars simply observed what was going on in the department, and wrote reports when they are back. Thus, together with improved language proficiency and an enriched cultural reservoir, innovation, collaborative spirit and international vision can never be overemphasized in the establishment of a positive international profile of Chinese visiting scholars, and the three factors should also be at the core of the long-lasting development of the visiting scholar programs.

## **Conclusion**

Based on two questionnaire surveys and two groups of semi-structured interviews, this study discusses Chinese visiting scholars' cross-cultural adaptation from the perspectives of linguistic confidence, cultural confidence and academic confidence, analyzes the correlation among the three types of confidence, and then proposes the concept of establishing a positive international profile of Chinese visiting scholars.

Since linguistic confidence and cultural confidence may enhance academic confidence in a cross-cultural context, and typically, linguistic confidence is the medium of the exhibition of academic confidence, Chinese scholars should first of all improve their language proficiency and make English learning part of their daily routines. Second, they should enrich their cultural

reserve and raise their cultural awareness by striking a balance between their absorption of Chinese culture and Western culture to smooth their cross-cultural communication. Also, Chinese visiting scholars should always bear in mind their identity as academics, that is, during their academic visit, they should strive to improve their academic capability, academic performance, and academic achievements by actively becoming involved in more international academic exchanges. The establishment of a positive profile of Chinese visiting scholars should be based on a systematic improvement in a profound integration of Chinese scholars' linguistic confidence, cultural confidence and academic confidence. Chinese visiting scholars should be more open-minded, initiative, proactive, and far-sighted in the process of their academic visits. They should become the representatives of China's international image, helping people in the host country to learn and understand more about China and Chinese culture, and should play a more active role in further internationalizing Chinese higher education.

Finally, although the study uses Chinese visiting scholars in the UK as a sample, it is believed that the notions in this paper will bring benefits for future visiting scholars from China and also for the sustainable development of the visiting scholar programs worldwide.

### **Implications and Limitations**

This study may have implications for the following subjects: First, CSC and the domestic universities and institutions in China should enhance the concept of “mutual benefits” and “sustainable development” of the visiting scholar programs. Meanwhile, they should improve the management of Chinese visiting scholars while they are abroad by keeping a balance between supervising rigorously and granting academic freedom. Second, individual scholars planning to go abroad should thoroughly improve their English proficiency and cultural knowledge, and the eleven Ministry of Education (MOE) Training Centers in charge of visiting scholars' language training should improve their training effectiveness and training modes to strengthen Chinese scholars' linguistic proficiency and cultural reservoir; both the individual scholars and the eleven Training Centers should strike a balance between the input of Chinese culture and the input of Western culture. Third, more research should be conducted on the importance of and practical approaches to establishing a positive international profile of Chinese visiting scholars.

Due to the small sample sizes of both the questionnaire surveys and interviews, the participants from different universities and institutions in the UK do not represent all the Chinese visiting scholars; the 10 interviewees, including four professors and six Chinese visiting scholars from the University of York, do not represent all the mentors and Chinese visiting scholars.

## Acknowledgements

I would like to express my sincere gratitude to Professor Helen Smith, my mentor at the University of York. Without Professor Smith's warm support, this study would not have been possible. I would also like to thank Professor Ian Davies, Professor John Dawson, and Professor Victoria Gould for their insightful contributions to this research. I also wish to extend my thanks to all the Chinese scholars who participated in the questionnaire surveys and interviews.

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(Editor: Yan Yuting)

# *A Comparative Study on the Buddhist and Brahmanic Conceptions of the Relationship between the Secular World and the Emancipation Realm*

Yao Weiqun\*

Peking University

**Abstract:** Buddhism and Brahmanism were two important religions in ancient India and their religious philosophies continue to be the fundamental components of contemporary Indian culture. However, these religions share common theoretical problems like explanation of the relationship between the secular world and the emancipation realm. This article examines this issue.

**Keywords:** Buddhism, Brahmanism, secular world, emancipation realm

**DOI:** <http://dx.doi.org/10.19873/j.cnki.2096-0212.2021.02.004>

**B**uddhism and Brahmanism both hold that the world in which mankind lives is full of pain, and that mankind should seek the realm of emancipation which is free of suffering. Both religions stress that to transmigrate and break away from suffering, mankind should obtain the highest wisdom regarding the world as this is the effective way to reach the realm of emancipation. Buddhism and Brahmanism have both paid close attention to the way of wisdom emancipation, believing that when people have obtained the highest wisdom, they will cease the pursuit of unreal things.

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\* Yao Weiqun, Department of Philosophy and Religious Studies, Peking University.

Correspondence concerning this article should be addressed to Yao Weiqun, Department of Philosophy and Religious Studies, Peking University, Beijing. E-mail: yaowq@pku.edu.cn

There will be no corresponding actions and karma, and hence it will then be possible to overcome suffering. Both religions hold as a major premise that the realm of emancipation and the secular world cannot be separated. Emancipation is in fact the realization of the true nature of the secular world. There is no emancipation realm independent of the secular world.

But the two religions' understandings about wisdom are different. According to the main viewpoint of Buddhism, the highest wisdom is the realization of the truth of dependent origination or emptiness. According to the main precept of Brahmanism, the highest wisdom is knowing that all things in the secular world are in fact basic reality.

Buddhist and Brahmanic conceptions of the relationship between the realms of the secular and the emancipation are a main point of discussion between these two religions. Their investigation in this respect in fact entails an analysis of the nature of things and an analysis of the value and the object of human behavior, both of which have an important significance in the history of Indian thought. Through research on these problems, we will gain a keener insight into perspectives on the ancient Indian conception of the world and of human life, and a better understanding of the development of Indian thought.

Buddhism and Brahmanism are the religions which had great influence on ancient India. The two religions hold that the world is full of suffering and they want to completely get rid of suffering and reach the supreme realm through wisdom in their religious theories. In the two religions, the secular world is also called the mundane world, and the supreme realm is usually called emancipation. The relationship between the realms of secular and emancipation is an important problem and both Buddhism and Brahmanism are concerned about it.

### **Theories of the Relationship between World Things and Brahman in Upaniṣads**

Upaniṣads (The Upaniṣads are ancient texts from India that were composed orally in Sanskrit between about 700 B.C.E. and 300 B.C.E.) are the old scriptures of ancient India upon which the very early philosophical conceptions were based. These conceptions have an important influence on the afterworld of Indian religion and philosophy and a direct influence on the afterworld of the Indian philosophy of Brahmanism. They also have a certain influence on Buddhism. The philosophers in Upaniṣads have raised their viewpoints about the nature of things in the real world and emancipation and these viewpoints have concretely manifested in the theories about the relationship between world things and Brahman in some important Upaniṣads.

The main thought of Upaniṣads holds that all things are essentially the same, and that they have no real difference. All kinds of things are the highest entity Brahman. For instance, Chāndogya Up. 3.14.1 says, "All this is Brahman" (Radhakrishnan, 1953, p. 391).

One conception that is often mentioned in Upaniṣads is Ātman. This word in many occasions has the same meaning with the word Brahman. That is, the highest or basic entity. Then, it can be called big Ātman. Ātman sometimes also refers to the subject in numerous living things. Then,



it can be called small Ātman. Ātman sometimes also refers to small Ātman, and the things in connection with it, which constitute all the phenomenon world.

Brhadāranyaka Up. 2.2.20 says, “As a spider moves along the thread, as small sparks come forth from the fire, even so from this self comes forth all breaths, all worlds, all divinities, all beings” (Radhakrishnan, 1953, p. 190). The self (Ātman) used here refers to Brahman or big Ātman, the highest entity in all the universe. The so-called “from this self comes forth all” means that Ātman or Brahman is the basis of all.

The thinkers in the Upaniṣads hold that because of ignorance men cannot recognize the nature of things and will sink into confusion and suffering. If men could know that things in essence are Brahman or Ātman, then they will get rid of suffering and obtain the highest emancipation. In this respect, Upaniṣads have much to say. For instance:

Chāndogya Up. 7.25.2 says, “The Self, indeed, is all this (world). Verily, he who sees this, who thinks this, who understands this, he has pleasure in the self, he has delight in the self, he has union in the self, he has joy in the self; he is independent (self-ruler); he has unlimited freedom in all worlds. But they who think differently from this are dependent on others (have others for their rulers). They have (live in) perishable worlds. In all worlds they cannot move at all (have no freedom)” (Radhakrishnan, 1953, p. 448). Here the so-called “have no freedom” naturally means sinking into suffering.

Iśa Up. 1.1 says, “When, to one who knows, all beings have, verily, become one with his own self then what delusion and what sorrow can be to him who has seen the oneness” (Radhakrishnan, 1953, p. 572)? Without the delusion and sorrow, one will obtain the emancipation.

Kaṭha Up. 2.1.2 says, “The small-minded go after outward pleasures. They walk into the snare of widespread death” (Radhakrishnan, 1953, p. 631). Here the so called “snare of widespread death” is in reality the greatest suffering. Kaṭha Up. 1.2.20 says, “The unstriving man beholds Him (Brahman), free from sorrow” (Radhakrishnan, 1953, p. 617). This means that if one has desire and seeks for unreal things outside, he will sink into suffering. Desire is caused by ignorance, by not knowing that all things in the world are in essence Brahman and Ātman. Knowing the highest Ātman and getting rid of suffering mean having obtained emancipation.

Brhadāranyaka Up. 4.4.8 says, “The wise, the knowers of Brahman go up to the heavenly world after the fall of this body, being freed” (Radhakrishnan, 1953, p. 274). Here “the knowers of Brahman” refers to the person who has seen that all things in the world are in essence Brahman. Obtaining the emancipation means getting rid of suffering forever.

Obviously, in Upaniṣads, the fundamental way to obtain the emancipation is the way of wisdom emancipation. In reality, it is the way of knowing the nature of things in the world. Only by having obtained the wisdom about the nature of things in the world can one reach the emancipation. This feature has been maintained in Indian religious philosophy and it has had great influence on the philosophical schools of Brahmanism and Buddhism in later times.

## Buddhist Theories of the Relationship between the Secular World and Nirvāṇa

When Buddhism came into being, it raised a basic notion—the world is full of suffering. Buddhists cultivate themselves according to their religious doctrines and their object is to get rid of suffering and obtain nirvāṇa. Nirvāṇa is just the emancipation. In different periods or different Buddhist scriptures, Buddhist views about the relationship between the secular world and nirvāṇa have varied.

Hīnayāna Buddhism usually holds that the secular society is full of stupidity and all kinds of afflictions. These afflictions make human beings painful. Mankind should get rid of the painful world and seek for a realm which is entirely different from the secular world. Early Buddhist scriptures mentioned that Buddha came from the secular world, but in Buddhist scriptures there are many views which are negative to the secular world. For instance, *Dīrghāgama* Vol.1 says, “Good wisdom is off from the secular world”<sup>①</sup>. There are similar sayings in Buddhist scriptures of āgama. For instance, *Samyuktāgama* Vol.18 says, “Rapacity has completely disappeared, hatred has completely disappeared, stupidity has completely disappeared, all afflictions have completely disappeared. That is nirvāṇa”.<sup>②</sup>

In early Buddhist view, the phenomena of rapacity, hatred, stupidity, and other afflictions exist in the secular world. If one gets rid of them, he or she will get rid of suffering and obtain the highest realm. Early Buddhism often said that the ordinary environment of the secular world was not suitable for Buddhist saints to obtain the truth. For instance, *Dīrghāgama* Vol.1 says, “The secular world is clamorous, it is not suitable for me, when can I leave these masses and find a peaceful place for truth?”<sup>③</sup> Here, it has shown the willing of getting rid of afflictions. in the secular world and seeking for the highest realm.

In later Indian sectarian Buddhism or Hīnayāna Buddhism, there was also such a tendency. For instance, *Abhidharma-kosa* Vol.6 says that just like the ray of a lamp goes out, the only thing that has happened is that the flame has been extinguished, and there is nothing that exists. Like this, Buddha’s mind has been emancipated. The only thing that has happened is that the five skandhas have become extinct, and there is nothing that exists. Here the nirvāṇa considers that the mind has been emancipated, the five skandhas have gone extinct, and that is the state of nothing existing. The nirvāṇa is the state of leaving the secular world where people are living.

The conception of Mahāyāna Buddhism in this respect is different from that of Hīnayāna Buddhism. Mahāyāna Buddhism holds that the nirvāṇa, or emancipation, is only the understanding of the nature of things in the world. We cannot leave this world and seek another world which is separated from the secular world. Just like *Vimalakīrti Nirdeśa Sūtra* Part II says, “Existing in nirvāṇa, but not breaking off the life and death.” “The secular world and the

① Tri-pitaka, 1934, 1, p. 9a

② T. 2, p. 126b.

③ T. 1, p. 7b.

transmundane world are two, but if the secular world is empty (sūnya), then it is the transmudane world.” “Life, death and nirvāṇa are two, if one has seen the nature of life and death, then there will be no life and death, no fetter and emancipation, it will not produce and extinguish.” “Being fond of nirvāṇa and being not fond of the secular world are two, if one is not fond of nirvāṇa and is not fed up with the secular world, then there is not two.”<sup>①</sup> This sūtra is against entirely separating nirvāṇa from the secular world. According to its view, since there is no absolute difference between the secular world and the transmudane world, or there is no absolute difference between life, death and nirvāṇa, the highest realm that Buddhism seeks for in reality cannot be separated from the secular world.

Mādhyamika’s view on this problem is similar to that of Vimalakīrti-nirdeśa-sūtra and other Mahāyāna Buddhist scriptures. It is also against entirely separating nirvāṇa from the secular world. Mādhyamika holds that the realization of things’ true original nature (tattvasya-lakṣaṇam) means obtaining nirvāṇa. According to Mādhyamika’s view, we cannot leave the secular world to seek for nirvāṇa transcending the secular world. If we seek for nirvāṇa by leaving the secular world, we cannot obtain it because nirvāṇa means realization of things’ true original nature. Obtaining nirvāṇa is just eliminating ignorance, is just knowing that the nature of all things is empty (sūnya) or false existence. For instance, in Mūlamadhyamaka-kārika Vol.4, Nāgārjuna said, “nirvāṇa and the secular world are not different, the secular world and nirvāṇa are also not different.” “The real nature of nirvāṇa and the nature of the secular world, these two are not different.”<sup>②</sup> In his explanation of Mūlamadhyamaka-kārika Vol.4, Pingalanetra said, “The secular world and nirvāṇa are not different, nirvāṇa and the secular world are also not different.” “By complete inference, we can know that there is no production of the secular world and nirvāṇa in reality. There is not any difference between the secular world and nirvāṇa because they equally cannot be obtained.”<sup>③</sup>

The nirvāṇa that Mādhyamika stressed is a spiritual or conscious realm that is in connection with the secular world. In this realm, one should know that the world things are empty after all, and one should not stick to any wrong view (including the wrong view of empty). This realm is not another independent upper realm which is separated from the secular world. It is the realization of world things’ true original nature (tattvasya-lakṣaṇam). So, in Mādhyamika’s view, the original form of the secular world is the nirvāṇa realm of Buddhism. There is no true difference between the two. Hīnayāna Buddhism differentiates the two unsuitably, because they have stuck to the wrong conceptions and distinguished the false things. They cannot know the original form of the secular world and cannot reach the things’ true nature. But if they follow the views of Mūlamadhyamaka-kārika and know the things’ true original nature (tattvasya-lakṣaṇam), then they will reach the nirvāṇa realm. So, in this sense, Mādhyamika says, “Things’ true

① T. 14, p. 549a-551c.

② T. 30, p. 36a.

③ T. 30, p. 36a.

original nature is nirvāṇa.”<sup>①</sup> Judging from this, we know that the true emancipation is in reality the correct cognition of the secular world. There is not any nirvāṇa realm outside the secular world.

Some discourses in Mahāparinirvāṇa-sūtra also have made reference to this problem. This sūtra (north version) Vol.6 says, “If it is said that Buddha’s going into nirvāṇa is just like fuel being exhausted and fire going out, then it is called meaning being not clearly understood. If it is said that Buddha’s going into nirvāṇa is just dissolving in the original essence of all beings, then it is called meaning being clearly understood.”<sup>②</sup> Here, the so called “meaning being not clearly understood” indicates considering Buddha’s nirvāṇa as the death of ordinary man. The “meaning being clearly understood” indicates considering Buddha’s nirvāṇa as realizing the nature of the secular world. Obtaining nirvāṇa is just understanding the original form of the world. Mahāparinirvāṇa-sūtra Vol.4 says, “If the oil is used up, the brightness will be extinguished. The brightness extinguishing is assimilated to afflictions extinguishing. Though brightness has been extinguished, the lamp still exists. Buddha is also like this, though afflictions have extinguished, the truth body (dharmakṣya) exists forever.”<sup>③</sup> Here it shows that nirvāṇa is not a state that has no connection with the secular world. The truth body (dharmakṣya) which exists forever will exist in the secular world. So we should not absolutely separate Buddha or his truth body from the things of the secular world.

In Indian Buddhism, though some people of early or Hīnayāna Buddhism separated nirvāṇa from the secular world, as a whole, Indian Buddhism stresses the connection of the two. And even in early Buddhism or sectarian Buddhism, the Buddhist theories they expounded are mainly about the secular world or life phenomena. And Mahāyāna Buddhism has considered nirvāṇa and the secular world together more closely.

### **The Wisdom Emancipation Theory of Brahmanic Philosophical Schools**

Brahmanic philosophical schools mainly refer to six philosophical schools. They are Vaiśeṣika, Nyāya, Sāṃkhya, Yoga, Mīmāṃsā, and Vedānta. These schools developed on the basis of Brahmanic philosophical thought of Upaniṣads. They also have raised a few of new notions. The theories of these schools have similarities and differences. They all have absorbed the conceptions of transmigration and nirvāṇa that were raised definitely in Upaniṣads. They all hold that in the secular world which is the form of transmigration, there is stupidity and suffering. One should get rid of suffering and reach the emancipation state. These schools have the same point, that is, the appearance of the transmigration state has a connection with man’s ignorance, and there is naturally suffering in the transmigration state. The most effective way to reach the emancipation

① T. 30, p. 25a.

② T. 12, p. 402a.

③ T. 12, p. 390a.

state is to know the nature of world things and get the highest wisdom. By the wisdom that can eliminate the ignorance, one will obtain the emancipation state. This point reflects itself in these schools in different degrees.

Vaiśeṣika holds that the action of man can produce karman. It will cause man to sink into the state of suffering transmigration. The action of man has a connection with his wrong understanding about the nature of world things. That is, it has a connection with the promotion of ignorance. So, in order to get rid of transmigration and break away from suffering, it is important to eliminate ignorance. Vaiśeṣika attaches great importance to analyzing the classification of natural phenomena. Its main theory is about the system of padārtha. It analyzes world things into a few padārtha (the real thing corresponding to the notion). Through the theory of padārtha, Vaiśeṣika has shown its basic views about world phenomena. The main scripture of Vaiśeṣika — Vaiśeṣika-sūtra 1.1.4 holds that supreme good comes from the realization of truth, and from the knowledge of padārtha (Gough, 1975, p. 4). Here, the so called supreme good is just the state of emancipation. In Vaiśeṣika's view, emancipation needs the wisdom of padārtha theory. With this wisdom, man can eliminate ignorance, get rid of suffering, and reach the highest realm.

Nyāya is a Brahmanic philosophical school which takes logic and debate rules as its main research content. But in the system of this school, there is also the conception of emancipation. Nyāya also holds that the secular world as a form of transmigration is full of suffering. It is the human beings' action and karman that have caused the transmigration. And all these have connection with ignorance. Nyāya-sūtra 1.1.2 says, "pain, birth, activity, faults and misapprehension, and the successive annihilation of these in the reverse order, there follows release" (Vidyābhūṣana, 1975, p. 2). Here, "misapprehension" is just ignorance. "Successive" means eliminating these things in the reverse order. That is, by eliminating ignorance, one can eliminate suffering. Eliminating ignorance requires obtaining wisdom, and Nyāya's wisdom is mainly reflected in its knowledge about the "sixteen tattvas" (sixteen categories about Nyāya's logic and debate rules). Nyāya-sūtra 1.1.1 emphasizes that the highest good comes from knowledge about the "sixteen tattvas. Here, the so called "highest good" also means emancipation after eliminating suffering.

The theoretical starting point of Sāṃkhya is also to get rid of suffering. This school holds that the union of prakṛti and puruṣa is the beginning of the formation of the secular world or life phenomenon. According to this school, in transmigration there are three kinds of suffering: internal suffering, external suffering and divine suffering. In order to get rid of suffering, one should separate prakṛti from puruṣa. To reach this object, one should know the original independent pure nature of prakṛti and puruṣa. The basic theoretical system of Sāṃkhya is "dual twenty-five principles," which are the most basic categories, reflecting the supreme wisdom of Sāṃkhya. Sāṃkhya holds that by this wisdom, one can distinguish prakṛti and puruṣa and know their original form of the things that come from the union of the two, so that one can obtain the absolute understanding of "non-self", "non-possession of the self", etc. Hence, prakṛti and puruṣa are

no longer in union, the transmigration comes to the end, and one will obtain emancipation. (See Isvarakṛṣṇa's Sāṃkhya-kārikā 1, pp. 64-68 and Gauḥapqda's corresponding explanation.)

Yoga has a close connection with Sāṃkhya. It emphasizes Yoga's concrete way of practice. As a religious school, it also holds that the world of transmigration is full of suffering. Its final aim is to get rid of suffering and obtain emancipation. This school has absorbed Sāṃkhya's basic thought, and holds that the union of prakṛti and puruṣa is the cause of transmigration, and that it is ignorance that creates the union of the two. Yoga emphasizes the importance of entering the state of samādhi, takes eight sub-branch methods of practice, and holds that this kind of method is helpful for distinguishing prakṛti from puruṣa. The wisdom of this distinguishing is the basic wisdom, which will eventually eliminate the volition power (seed) producing transmigration, so one can obtain the emancipation and get rid of suffering. (see Patanjali's Yoga-sūtra 3, p. 49; 4-29-34.)

Mīmāṃsā holds that dharma and adharma have caused the state of transmigration, and that the action has caused the dharma and adharma. In order to get rid of the transmigration, one should hate the world's afflictions, and should know that happiness in this world is always in close connection with suffering. One should not be interested in pleasure, and should stop doing such things as are prohibited by sacred scriptures and such things as may bring us secular pleasures, so that one will no longer sink into the transmigration (Ganganatha Jha "Pīrva-Mīmāṃsā, 1964, pp. 31-32; See Radhakrishnan, 1931, pp. 422-423). In Mīmāṃsā, Veda is considered as the source of wisdom, and has been given a sacred status. But early Mīmāṃsā said little about the relationship between wisdom and emancipation. Later, the thinkers of Mīmāṃsā have taken the understanding of self (Ātman) which is the essence of life phenomenon as the important condition of obtaining emancipation. This in fact also shows the concept of wisdom emancipation.

Vedānta is the main school of Brahmanic philosophy. This school has inherited and developed the theory of the relationship between world things and basic reality Brahman in Upaniṣads. The main branch of this school is also called "advaita." According to "advaita," the world things in fact are the Brahman. Ordinary people do not know this because of ignorance, so they pursue the world things outside the Brahman, pursue the eternal things or the things which can be owned for a long time. Owing to such actions of pursuing, karman is produced and suffering in transmigration phenomenon is caused. The most effective way to be free from transmigration and get rid of suffering is to obtain the wisdom of Brahman and know the advaita nature of world things and Brahman. In the scriptures of Vedānta there are many expositions in this respect. For instance, the main representative of Vedānta advaita thinkers Śaṅkara said in his Brahma-sūtra-bhāṣya 1.4.22, "The difference of the self and the highest self is not real, but due to the limiting adjuncts, viz., the body, and so on, which are the product of name and form as presented by ignorance." Here, the "highest self" is just the Brahman. The innumerable other selves and relevant names and forms are in fact all kinds of things in the phenomena world. These phenomena are things not independent of the highest self in nature, but are the same as the highest self. The difference in the two is not real, and is the product of ignorance. Śaṅkara in his



Brahma-sūtra-bhāṣya 1.1.19 said, “The phrase Blissful One is not used to mean either Pradhāna or the individual being, because the scripture enjoins the identity of this one, i.e. the enlightened individual being, with this, i.e. the Blissful One, the self under consideration...He does not become free from the fear of transmigration so long as he sees in this Blissful One the slightest difference consisting in non-identity (with the Self). But he becomes free from the fear of transmigration as soon as he gets established in an absolute identity with this Blissful One.” Here, the “Blissful One” is just the Brahman, the “enlightened individual being” is just the man in the secular world. The advaita thinker here in fact wants to show that only with the wisdom of identifying the world things with Brahman, can one get rid of transmigration and obtain real emancipation.

### **Comprehensive Comparative Analysis**

The ancient Indian philosophers began very early to consider the problem of how to get rid of secular world suffering. The main schools of Buddhist and Brahmanic philosophy have taken the problem of the secular and emancipation realms as the main researching point, and have analyzed the connection of the two. The two religions’ viewpoints in this respect have similarities and differences.

The main similarities of the two religions in this respect are:

First, the two religions both hold that the secular world is full of suffering, and that mankind should seek emancipation or nirvāṇa. For Buddhism or for Brahmanism, the secular world as the form of transmigration is painful in nature. The so-called good form of transmigration is relative, and happiness in the secular world cannot last long. So long as the transmigration exists, suffering will be inevitable. So, both Buddhism and Brahmanism hold that one should try his or her best to understand the highest wisdom and seek to reach the realm of nirvāṇa, or emancipation.

Second, the main schools or thoughts in the two religions both hold that the secular world has a close connection with the emancipation realm. Mahāyāna Buddhism especially has emphasized that the secular world and nirvāṇa (emancipation) cannot be distinguished in nature (in real sense). It holds that the so-called emancipation is just the understanding of the real nature of the secular world. The original form of the secular world is the so-called nirvāṇa. Nirvāṇa is not a world that has no connection with the secular world, but a spiritual realm where all living beings have reached after they have eliminated the ignorance of the secular world. Brahmanic philosophical schools also take getting rid of suffering in the secular world as the object of emancipation. Among these schools, Vedānta holds that all the things in the secular world are in fact Brahman, and that knowing the realm of Brahman is just knowing the realm of the original form of the secular world. The realms of the secular and the emancipation are not two worlds which have no connection.

Third, the two religions have emphasized the wisdom emancipation way of getting rid of suffering. Buddhism and Brahmanism both hold that it is ignorance that has caused the transmigration phenomenon and its corresponding suffering. Owing to ignorance, mankind

pursues the unreal things and such actions will produce karman, and karman will produce its corresponding suffering in the transmigration world. In order to get rid of transmigration and be free of suffering, one should eliminate ignorance. Eliminating ignorance relies on the corresponding wisdom. With wisdom, human beings can know the nature of world things and will not pursue the unreal things. There will be no action, no karman, no transmigration, and no suffering in the secular world. That is emancipation. So both Buddhism and Brahmanism have emphasized the way of wisdom emancipation.

The main differences of the two religions in this respect are:

First, the two religions' views about ignorance which causes the suffering in the secular world are different.

According to the view of the main schools in Brahmanic philosophy, the ignorance which causes the suffering in the secular world is not being able to know that all things in the secular world are in fact Brahman. The person who does not know this will pursue the things independent of Brahman, which will produce the karman and its corresponding suffering in the transmigration. Only by eliminating such ignorance can one reach the emancipation. According to the view of the main schools in Buddhism, the ignorance which causes the suffering in the secular world is not being able to know that all things in the secular world are in nature dependent originations. The person who does not know this will pursue the real eternal subject, which will produce karman and corresponding suffering in the transmigration. Obviously, the contents of ignorance in the two religions are quite different.

Second, the contents of wisdom in the two religions are different. In order to eliminate ignorance and obtain emancipation, Buddhism and Brahmanism have raised the concrete contents about wisdom. There are various branches or schools in the two religions and the theoretical systems in these branches or schools are different, so the contents of wisdom are also different. Wisdom that the main schools of Buddhism have emphasized is the conception of *asvabhāva* (nonexistence of self) or emptiness (*sūnya*). Wisdom in the schools of Brahmanism is mainly reflected in the *advaita* theory of *Vedānta*. It is also reflected in the transformation theory of *prakṛti* of *Sāṃkhya*, in *padārtha* theory of *Vaiśeṣika*, etc. The main theoretical differences of wisdom in the two are that Buddhism advocates the theory of entity non-existence, but the philosophical schools of Brahmanism usually advocate the theory of entity existence. These wisdoms are the main means of these schools to know the nature of the world things and to obtain emancipation.

Buddhist and Brahmanic conceptions of the relationship between the realms of the secular and the emancipation are the main discussion content of the two religions. Their investigation in this respect in fact entails an analysis of the nature of things and an analysis of the value and the object of human behavior, both of which have an important significance in the history of Indian thought. Through research on these problems, we will gain a keener insight into perspectives on the ancient Indian conception of the world and of human life, and a better understanding of the development of Indian thought.



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(Editor: Xiong Xianwei)

# On the Characteristics of Classical Natural Law

Cheng Zhimin\*

Hainan University

**Abstract:** Classical natural law still retains its deep transcendental roots, *i.e.* ancient Greek cosmology, although it is no longer based on theodicy. The oldest meaning of the universe (*kosmos*) is not nature, but order. Therefore, the universe is larger than nature. Cosmology, which takes a holistic approach to everything, is superior to reason or ontology, which underlies modern natural law and is essentially a mechanistic worldview. Classical natural law does not regard reason as the ultimate cause to avoid the disconnection of “form” from “substance,” which is a disadvantage of modern thought resulting in a loss of regulative capacity. The eternal recurrence (*ewige Wiederkehr*) of natural law requires us to constantly revisit the idea of classical natural law in order to find a real footing for the salvation of reality.

**Keywords:** natural law, divine law, cosmology, reason

**DOI:** <http://dx.doi.org/10.19873/j.cnki.2096-0212.2021.02.005>

Unlike modern natural law, which is self-evidently rational, classical natural law exhibited inherent conflicts and struggles right from the very beginning and underwent a rather long process of integration before reluctantly coming into being under the name natural law. Thus, to modern people, natural law is the inherent law of the universe or reason, an objective standard for determining what is right and wrong, and a ready-made “higher law.” To ancient people, however, the term natural law itself was questionable, as behind it lay a paradox of choice concerning fundamental issues of human

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\* Cheng Zhimin, Center for Social Sciences, Hainan University;

This paper is a staged research result of “Translation and Study of Francis Bacon’s Works” (18BZX093), a program funded by The National Social Science Fund of China (NSSFC); “Notes and Commentaries on Sentences and Phrases in The Apology of Socrates” (17JHQ0012), a major program whose late-stage research was funded by the Ministry of Education; and a program sponsored by the Research Startup Fund of Hainan University (kyqd[sk]18001).

Correspondence concerning this article should be addressed to Hainan University, Haikou. Email: outis@qq.com

thought, such as rationality versus enlightenment, the sacred versus the secular, vindication of God versus vindication of man, ancestry versus mastery (or, in Confucian terms, “following the earlier kings” versus “following the later kings”), revolution versus conformity, democracy versus tyranny, necessity versus freedom, and will versus norm.

How did the “nature-law” issue become inherently conflicting? Why did nature and law clash with each other in a particular historical period? What was the relationship between nature and law prior to the emergence of their conflict?

Originally, all was under law (*themis* or *nomos*) and all natural beings (*physis*) in the universe were subordinate to law. In such a context, nature and law were inclusive and free from any conflict. Even with new meanings added, *physis* remained highly consistent with *nomos* in terms of purposiveness and sacredness and even retained original unity in terms of social or group functions, otherwise the later emergence of natural law would not have been possible. With the rise of reason, however, religious beliefs, which were the basis of “law,” became the target of attack. The nature-law conflict that emerged during that period was in fact first manifested as a fundamental conflict between reason and faith, or between religion and philosophy in the form of either safeguarding or rebelling against tradition. Using the nature of things as a weapon, the revolutionaries opposed the confinement of outdated dogmas and all *nomos* (which stood for norm).

Recent studies of natural law slightly resemble classical natural law for being a “problem” itself. Yet, the respective problems they deal with are essentially different. The school of new natural law tries to counter legal positivism with the old *nomos* (or rather, classical natural law) “shields perceptions of the current world situation from the confusion of legal positivism” (Schmitt, 2006, p. 69. Cf; George, 1999, pp. 17ff), the erosion of skepticism, the poisoning of atheism and the resulting ethical relativism in *absinkende Zeit*, and to eventually allow us to escape extinction in the surge of nihilism. Nevertheless, the modern physics-based concept of *physis* is in nature a mechanistic cosmology, which has no place for natural law and leaves *physis* itself, the very foundation of natural law in ontology unsettled (to say nothing of the existence of the gods). As a result, “Thus positivism, which was now beginning its triumphal march, obtained its laurels all too easily, since it was indeed able to vanquish this historical form of a philosophy of law which called itself natural law, but not the idea itself of natural law” (Rommen, 1998, p. 96). Thus, however hard the academics try to revive natural law, it remains highly questionable whether they will manage to solve what they are trying to solve—that is the most fundamental issue facing the current study of natural law.

### **Cosmology as the Basis of Classical Natural Law**

To the ancients, the idea of nature or universe itself was characterized by personality, which means it signified human emotions (pleasure, anger, sorrow and joy), will and purpose. Most

importantly, as nature or universe was believed to have been divinely ordained or created, it was endowed with divinity.<sup>①</sup> In this way, natural law and divine law were connected by one similarity, namely cosmology. Heraclitus considered divine law to be a natural law reflected in the law and relevance of the universe, “His divine law is a law of nature, manifesting itself in cosmic regularities and reciprocities, the sun’s diurnal rotation, seasonal changes, and the cycle of life and death. It also appears to be natural, as distinct from human, law, with a universal, authoritative, and objective scope that civic laws can at best seek to approximate” (Long, 2005, p. 418). Natural law, which was close to divine law, was mainly reflected in the “continuous emergence of the new” in the universe. According to Heraclitus, natural law exists in the law of the universe, or can be understood as the law of the universe itself. By law of the universe, he meant “cosmic justice,” rather than “cosmic law.” Likewise, the idea of natural law did not appear as a form of normative integration in the golden age of the ancient Greek civilization, when *dike* (justice) was preferred to *nomos* (although the term *dike* was of judicial significance). The “natural justice” in ancient Greek sense corresponded to the so-called “natural law” which appeared later (Plato, *The Republic*, n.d., 501b, *The Laws*, n.d., 889d-890d, *Timaeus*, n.d., 83e4-5; Thucydides, *The History of the Peloponnesian War*, n.d., 5.105; Aristotle, *Nicomachean Ethics*, n.d., 1134b-1135a).

In the view of the ancients, the universe itself, which includes the sun, the moon and the stars, and witnesses the lapse of seasons and years, is sufficient to prove the existence of the gods (Plato, ca. 360 B.C.E., *The Laws*, 885e-886a). The gods control the repeated changes of nature (Plato, ca. 360 B.C.E., *The Laws*, 715e-716a); the fundamental law for the harmonious coexistence of all things in the universe should be the goal of mankind, or should at least make man devout and kind (Plato, *Epinomis* 990a; Cicero, *On the Laws*. 2.16, *On the Commonwealth* 1.26, 6.20-29, 2.16). It was precisely in the context of divine law that Plato sought support for cosmology.

Unlike the Hebrew God who created everything, the ancient Greek gods were responsible only for “ordering” the universe. The word *theos* (gods) in ancient Greek came from *tithemi* (meaning “to put”). Originally, everything was out of order. It was the gods that “put things in order” (*die-kosm-ēsen*), integrated them into a whole, namely, the universe (*kosmos*) and endowed the whole world with sacredness, naturalness, purposiveness and morality (Plato, *Timaeus*, 69c). In ancient Greek, both “the universe” and “order” were referred to as *kosmos*. Now that *kosmos* covered “nature” and “law”, there was “natural law” in the *kosmos*.

Cicero echoed the idea more bluntly, “The immortal gods implanted souls in human bodies so as to have beings who would care for the earth and who, while contemplating the celestial order (caelestium ordinem), would imitate it in the moderation and consistency (constantia)

① Nature is purposeful, rather than accidental or spontaneous (Aristotle, *The physic*, n.d., 198b34-199a2). In this regard, similar ideas can be found in ancient Chinese philosophies. For example, Dong Zhongshu said, “Just like man, the heaven also has its own emotions (pleasure, anger, sorrow and joy). It is precisely this similarity that enables interaction and harmony between man and heaven” (Dong, 1992, p. 341).



of their lives” (Cicero, trans. 1923). *Constantia* is eternity, which is also one of the essentials of natural law. The movement of celestial bodies and the change of seasons are the law of “nature,” and also the law that man should imitate (Cicero, ca. 352 B.C.E., *On the laws* 1.61, 2.16). Obedience to “obey this celestial order (caelesti descriptioni), the divine mind and the all-powerful god” (Cicero, ca. 52 *On the Laws* 1.23) is obedience to natural law and divine law, for the basis of natural law is celestial regency. Similar ideas can be found in ancient Chinese philosophy, too. Mozi once said, “What then should be taken as the standard in government? Nothing better than following Heaven. Heaven is all-inclusive and impartial in its activities, abundant and unceasing in its blessings, and lasting and untiring in its guidance. And, so, when the sage-kings had accepted Heaven as their standard, they measured every action and enterprise by Heaven. What Heaven desired they would carry out, what Heaven abominated they refrained from” (Mozi, *Fayi*). Laozi held that “the ‘Tao’ (the divine law) follows nature” (Laozi, *Laozi*) because “Heaven is the divine law, and the divine law is eternal” (Laozi, *Laozi*). Later, Dong Zhongshu advocated “following the laws of Heaven and nature” (Dong, n.d.).

Cosmology as the basis of classical natural law was not debated in ancient times. But in modern times, cosmology may sound old-fashioned, unscientific or even superstitious to people, who may thus oppose classical natural law and eventually make (classical) natural law no longer possible. Or to flip it around, with cosmology as a divine teleology, along with the holistic mindset abandoned by modern people, natural law loses ground and inevitably comes to an end. Under such circumstances, a careful examination of the positive senses and possible limits of classical cosmology is needed.

From a contemporary perspective, classic natural law is associated with an antiquated classical cosmology, which, however, seems to have been found untrue by the huge achievements of modern science. Is that true? Leo Strauss did not think so, holding that modern natural sciences, however successful they become, had no impact on our understanding of “what is human in man” at all. Modern natural sciences no longer see the universe and human nature as “the whole,” making “man as man wholly unintelligible.” “The whole is of mysterious character, and man’s openness to the whole contains the quest for cosmology” (Strauss, 1988, p. 39). Classical cosmology is an organic and holistic view, while modern cosmology is an outcome of mechanical technology. To the ancient Greeks, “heaven and earth and gods and men are bound together by communion and friendship, orderliness, temperance, and justice, and it is for that reason they call this Whole a Cosmos” (Plato, ca. 380 B.C.E., 508a). This view was proposed some 2,000 years earlier than *das Geviert*, which was proposed by Martin Heidegger with great effort. From a holistic perspective, cosmology is more brilliant than ontology. But the general history of philosophy wrongly assumes it is a historical progress to shift from cosmology to ontology, and to epistemology and the study of speech.

Without a holistic cosmology, man, the gods and the universe would be separated from each other and have no relevance to each other; everything would turn into an atomic natural

element; the meaning of life would be buried in “science.” What makes classical cosmology superior to modern cosmology is that classical cosmology retains a concern for humanity. When Descartes’ universe replaced Aristotle’s, and when a universe made up of nature was replaced by a vast thing—the extension (whose components, arrangement and reorganization allowed itself to be handled perfectly in a mathematical way), we had to cope with a picture of the world in which the teleological elements are as irrelevant as the elements of color and taste are to geometry (Simon, 2016, p. 91). This mechanistic view of the universe, which started from Descartes, was already common in Plato’s time (Plato, ca. 360 B.C.E., *Laws* 889b-c). It goes without saying that there can be no such thing as natural law in a thoroughly mechanistic universe (Simon, 2016, p. 93).<sup>①</sup> Strauss thus asked, “What is wrong with cosmology? What is wrong with man’s attempt to find his bearing on the basis of what is apparent to him as a man?” (Strauss, 1997, p. 371). The contemplation of the divine principle in classical philosophy is not a value-neutral, objective study purely in search of knowledge, but a basis “by which we are led to the right conduct” (Strauss, 1997, p. 373). The fundamental teaching of classical thought is “know thyself,” which is primarily about finding one’s place in the universe—one of the most important teachings of classical cosmology and its resulting theory of natural law.

### The Place of Reason in Classical Natural Law

In ancient times, Natural law is a “divine gift,” and as long as natural law exists, it seems to be natural and rightful. Even so, natural law itself is not self-evident. Therefore, our understanding of natural law requires the intervention of human reason. Although natural law in Ulpian’s term refers to something that nature gave to all living things (*natura omnia animalia docuit*) (Justinian, 1989, p. 6), there is no doubt that only humans can experience and even participate in the laws of the universe. After all, of all creatures, only humans have reason. This close association of reason with natural law can easily lead to the misconception that natural law, which can only be understood through reason, is nothing more than a product of reason. Such a misconception, however, is made by modern natural law.<sup>②</sup> Besides, even if reason and natural law can hardly be separated from each other, there is still a world of difference between the “reason” of today and the “reason” in ancient times in terms of meaning and limit.

#### Reason: Not the Ultimate Cause

The ancients considered rational beings more noble than irrational beings. To them, the

① The natural teleology held by Morelly in *Code of Nature* (1982, p. 21) is in fact a mechanistic view of nature (p. 24). Given that, Morelly’s citation of Cicero was essentially a misunderstanding. Strauss criticized the mechanistic view of the universe but defended Aristotle’s teleological view of the universe (Strauss, 2003, p. 8).

② Pound’s understanding of natural law in Roman law is very modern, as the natural law in his vision is in fact an equivalent to modern natural law. “Natural law is a discursive legal style.....It originates from reason and is constructed in a philosophical way. The creative application of this ideal helps outline the characteristics of the classical Roman law-governed era” (Pound, 2004, p. 36).

gods are the noblest of all beings and therefore deservedly possess absolute reason. The goal of man is to use reason or rationality as a means to find ways to “resemble the gods,” i.e., to move towards or approach divinity and achieve perfection as much as possible, which is known as natural law (Plato, *Timaeus*, 90c6-d7). Cicero argued, “Those who have been given reason by nature have also been given right reason, and therefore law too, which is right reason in commands and prohibitions; and if they have been given law, then they have been given justice too” (Cicero, Ca. 360 B.C.E., *On the Laws*, 1.33). Natural reason (*naturalis ratio*) reveals law<sup>①</sup> and, more importantly, it is in itself *lex divina et humana* (Cicero, *On obligations*, n.d, 3.23, *On divination*, n.d., 1.90, 1.30, 2.37; Plato, *Minos*, n.d., 316b5, *Theaetetus*, n.d., 172b, 177d; Aristotle, *Rhetoric*, n.d., 1375a31-b5).

According to the theory of classical natural law, “Law is the highest reason, rooted in nature.....when this same reason is secured and established in the human mind (*mente*), it is law” (Cicero, ca. 360 B.C.E., *On the Laws*, 1.18); “virtue evidently consists in perfect reason and this certainly resides in nature” (Cicero, ca. 360 B.C.E., *On the Laws*, 1.25, 56). The “reason” here does not refer to anyone’s reason, or human reason, but a “universal” reason. Natural law is more of an outcome of divine reason. The theory of modern natural law, however, relies on individualistic rationalism, with the result that abstract humanity, rather than divinity, becomes the basis of natural law. Hugo Grotius made it clear that “the mother of right—that is, of natural law—is human nature” (Grotius, p. 1749; Pound, 2004, p. 48).<sup>②</sup> His words marked a watershed. “For henceforth not God’s essence, but human nature, viewed existentially as well as merely in the abstract, would be regarded as the source of natural law” (Rommen, 2007, p. 88). As a result, the basis of natural law becomes an imagined state of nature. But Thomas Aquinas long ago warned, “It does not suffice that it advance from first principles implanted by nature” (Aquinas, 2000, p. 12).

While sacred, reason is not supreme and is essentially a means to the end of virtue. Reason has a significant capacity to enable an understanding of natural law, but its capacity is bound to be limited. In other words, classical natural law recognizes that law comes from “right reason,” but reason is not the ultimate cause, which comes from the divine. Without the divine, there would be nothing in the universe more remarkable than man. This assumption, i.e. non-existence of the divine, is *summae adrogantiae* and even *sane adrogantis*. Yet, this invalid assumption became a reliable logical premise (*non esse Deum*) to Grotius.

Aquinas proclaimed, “Human reason is not, of itself, the rule of things: but the principles impressed on it by nature, are general rules and measures of all things relating to human conduct, whereof the natural reason is the rule and measure, although it is not the measure of things that are from nature” (Aquinas, 2016, p. 20). Thus, the reason which classical natural law

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① Huang Feng, translator of *Gai institutiones* (Chinese edition) translated *naturalis ratio* into “natural reason” in Chinese (Gaius, 1996, p. 2).

② In Finnis’ view, Aristotle (*Metaphysics*, n.d., 1070a12, 1015a14-15) and Aquinas had built natural law on human nature (Finnis, 2011, p. 103).

resorts to is far from (modern) rationalism. “The proud spirit of modern rationalism is lacking. There is no assertion of man’s self-sufficiency and inherent perfection. There is no vindication of abstract ‘rights’ nor of the autonomy of the individual as the ultimate source of all laws and of all standards” (D’Entreves, 2008, pp. 50-51). In the ancients’ view, great reason in itself needs to be supported or even proved by other evidence; reason is not, after all, ultimate. And “there is in (classical nature law) no trace whatever of the extravagances of the rationalistic natural law current in the seventeenth and eighteenth centuries” (Rommen, 2007, p. 49). The difference between classical natural law and modern natural law lies in the fact that the former denies natural law to be an outcome of reason, while the latter, having eliminated deism, can only base natural law on reason and consider natural law to be an outcome of self-deduction through speculative reason (Kant, 1781, Axx, Bxiii, B780).

### The Finitude of Reason

Any finite being in this world features a paradoxical duality, with both advantages and disadvantages. To the ancients, god-given reason is admittedly keen (Cicero, *On moral ends*, 5.57). Yet, wrong application of reason makes one suffer the consequences. After all, no bad thing is the masterwork of *bona ratio* (Cicero, *On divination*, 3.71). To the ancients, reason is great and therefore needs to be treated with more caution. “The greater and more divine their superiority, the greater their need of assiduous care. And so reason if well employed (*adhibita*) sees clearly what is best; if left neglected it is entangled in a multitude of deceptions.” (Cicero, *Tusculan disputations*, 4.58). Elsewhere, Cicero thoroughly reflected on the finitude of reason:

God gives us only reason, assuming that in fact he does; whether it is good or bad depends on ourselves. When reason is bestowed upon a person by the gods’ gift, it is not analogous to a bequest left to us, for if they had wished to harm us what better could they have bestowed on mankind? If reason does not underlie injustice, lack of restraint and cowardice, from what seeds would these vices sprout? (Cicero, *On the nature of the gods*, 3.71)

The evil in the world is also the “masterwork” of reason. Given that, reason is not omnipotent, let alone the best. In essence, reason is not the god. In fact, Socrates had long since sharply criticized the then roaring wave of rationalism. He was originally convinced by Anaxagoras’ theory of mind (*nous*), but later discovered this theory to be a hubristic nonsense. According to Socrates, Anaxagoras’ theory, which held that mind organizes (*diakosmōn*) and arranges (*kosmein*) all things, including the universe (*kosmos*), was theoretically groundless and sacrilegious. That was why Socrates took a different route and started his famous “second voyage” (Socrates, *Phaedo*. 97c-99d). Modern scholars have also recognized that reason can lead man astray. To them, it is no surprise that under such circumstances this reason turned into one of the most dangerous tools of vices and took the wrong turning (Morelly, 1982, p. 30).

Reason is often compared to the sun, for it enables us to see everything more clearly, “but we cannot stare at the sun long, for the light would ruin our eyes” (Plato, *Phaedo*, 99d5-7).

The sun (reason) can nourish all things. But excessive sun exposure can cause a “house fire.” There are some modern thinkers “having their eyes hurt” due to their addiction to reason. It has become an irreversible fact that their over-amplification of the brilliance of reason gave rise to an extensive crisis in modern philosophy. The explanation is as follows, “The rationalism of the Encyclopedists, making of natural law no longer an offspring of creative wisdom but a revelation of reason unto itself, transformed natural law into a code of absolute and universal justice inscribed in nature and deciphered by reason as an ensemble of geometric theorems or speculative data” (Maritain, 2009, pp. 74-75).

Suarez, Grotius, Descartes and Pufendorf endowed reason with infinite power, making the objective order of all things (*ordo rerum*) and also natural law, which was based on it, superfluous. To them, human reason was supreme; while to ordinary people, their ego and everything related to it were directly guaranteed via “I think.” Man becomes an angel because he has reason. Modern rational epistemology is angelic epistemology in essence. “Rationalism soon made human reason and its innate ideas the measure of what is. Human reason could now indulge in the uncontrolled construction of systems that have characterized the natural law of rationalism” (Rommen, 2007, pp. 80-81). Nevertheless, this anthroposophical angelism was bound to degenerate, and reason would not be able to support human morality and would eventually be taken over by economic status. Modern scholars such as John Finnis, having abandoned metaphysics, tried to develop a doctrine of natural law without nature. The natural law in the age of naturalism, individualism, radicalism and rationalism eventually became the founder and gravedigger of modern thoughts.

### **The Form and Substance of Natural Law**

In classical thought, reason is an external cognitive faculty with specific connotations. Natural law is right reason, whose rightness is reflected in its guidance to virtue. Thus, virtue is the connotation of reason and is also the main target of classical natural law (Laertius, *Lives of eminent philosophers*, 7.94). Natural law is called the “teacher of life” because it is in itself the *leges vivendi et disciplinam* or *vivendi doctrina* (Cicero, ca. 360 B.C.E., *On the Laws*, 1.57, 1.58). Strauss concluded, “Natural law directs man toward his perfection, the perfection of a rational and social animal; it is ‘the guide of life and the teacher of the duties’ (Cicero, *On the nature of the gods*, 1.40); it is the dictate of reason regarding human life. Thus, the virtuous life as choice-worthy for its own sake comes to be understood as compliance with natural law—with a law, and hence as a life of obedience. Inversely, the content of natural law is the whole of virtue” (Strauss, 1983, p. 141).

Classical natural law values reason, but it ultimately aims at virtue and happiness in order to safeguard human interests (Cicero, *On obligations*, 3.31). If such content is still not deemed substantive enough, the classical view of reason and its implicated natural law also



have concrete provisions concerning reverence for the gods, defense of mother country, filial devotion to parents, and loyalty to brothers and friends. “If nature does not ratify law, then all the virtues may lose their sway. For what becomes of generosity, patriotism, or friendship? Where will the desire of benefitting our neighbors, or the gratitude that acknowledges kindness, be able to exist at all? For all these virtues proceed from our natural inclination to love mankind. And this is the true basis of justice, and without this not only the mutual charities of men, but the religious services of the gods, would be at an end” (Cicero, Ca. 360 B.C.E., *On the Laws*, 1.43). All these virtues (reverence, sincerity, loyalty, filial piety, fraternity and kindheartedness) are the inherent connotations of classical natural law or classical rationality.

Through continued deification of its content, reason was eventually brought to its climax by Kant and Hegel, to whom everything could be deduction from reason. “Human reason now becomes the sovereign architect of the order of knowledge; it becomes the measure of things. The objective basis of natural law, the *ordo rerum* and the eternal law, has vanished. What was termed natural law is a series of conclusions drawn from the categorical imperative and from the regulative ideas of practical reason, not from the objective and constitutive *ordo rerum*” (Rommen, 1998, p. 78). The true meaning of the “our faculty of understanding is the primary source of nature’s lawfulness” is that human reason is the source of natural law. Natural law is primarily about safeguarding free will. The “categorical imperative” or “definitive imperative” of natural law becomes an empty form. “Act only in accordance with that maxim through which you can at the same time will that it become a universal law” (Kant, 1997, p. 31). The “categorical imperative” of this universal natural law (*allgemeinen Naturgesetze*) seems similar to the quote by Confucius—“Do not do unto others what you do not want done unto you” (Confucius, Duke Ling of Wei, *The analects of Confucius*). But Confucius also specified what must be obeyed in conduct and behavior beyond this formal principle, while Kant did not teach anything substantive in this rational “categorical imperative.”

Johann Gottlieb Fichte also expressed an idea similar to Kant’s “categorical imperative.” He said, “The principle of any judgment of right is that each is to limit his freedom, the sphere of his free actions, through the concept of the freedom of the other (so that the other, as free in general, can exist as well)” (Fichte, 2000, p. 102). But mankind had struggled in this vast ocean of “freedom” for centuries before a narrow escape from drowning. They became more and more aware of the fact that freedom, although being the basis of modern natural law, has no substance at all. If not carefully distinguished, concepts like freedom, equality, natural state, will and absolute rights can be a mirage leading to nowhere.

Modern natural law is based on the scientific “natural law” or “law of nature” (Gierke, 1934, p. 35)<sup>①</sup>. But unfortunately, “the ‘natural law’ of the natural sciences only denotes a calculable

① According to Gierke (1934, p. 35), a leading scholar of natural law, it was the “law of nature” that led to the disintegration of the medieval concept of natural law. John Locke directly applied “law of nature” in the sense of natural law (Locke, 2014).



function without substance” (Schmitt, 2006, p. 72). Just like philosophical positivism, scientific natural law has no interest in core issues such as “origin” and “root” and therefore becomes homeless and rootless. Pufendorf (and Hobbes) and Cicero all understood natural law as an outcome of “right reason.” Cicero specified what reason was right (Cicero, *On obligations*), while Pufendorf just mentioned this “right reason” in vague terms (Buckle, 2014, p. 131). Similarly, in Kant’s view, “The impersonal, formal, categorical imperative takes the place of the eternal law. The natural law, therefore, as part of the *lex naturalis*, is no longer connected with the eternal law, for the very reason that it can no longer be understood as part of the *lex naturalis*, of the rational moral law. Furthermore, not enforceability but external physical force is directly and necessarily included in the concept of law” (Rommen, 1998, p. 90). Kant’s rational formalist argument prevented him from developing a doctrine of substantive value. To this end, Max Scheler competed a lengthy critique of Kant’s pure formalism (Scheler, 2011, pp. 8-9, p. 113).<sup>①</sup> In this way, natural law ceased to have any substantive content and eventually came to an end.

## Conclusion

The shift from divine law to natural law seems to be an inevitable process, which was already marked in ancient Greece: “The quest for the beginning, for the first things, becomes now the philosophic or scientific analysis of the cosmos; the place of the divine law, in the traditional sense of the term, where it is a code traced to a personal god, is replaced by a natural order, which may even be called, as it was later to be called, a natural law—or at any rate, to use a wider term, a natural morality. So the divine law, in the real and strict sense of the term, is only the starting point, the absolutely essential starting point, for Greek philosophy, but it is abandoned in the process. And if it is accepted by Greek philosophy, it is accepted only politically, meaning for the education of the many, and not as something which stands independently” (Strauss, 1989, p. 256). Later, divine law became a theoretical guarantee or an ideological irrelevance, which was perhaps also an inevitable trend. Unlike classical natural law, which relied on reason while being well aware of the perils of reason, modern natural law, after “executing deism” (Heine, 2007, p. 78), had no alternative but to leave natural law, or even the entire spiritual world to reason.

Although the separation of divine and natural law had already occurred to Cicero, the two

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① Scheler once made a vicious comment on Kant. According to Scheler, Kant’s ethics is not half right or all wrong, but the “devil’s words” (Scheler, 1999, p. 715). The fundamental reason may lie in the fact that Kant was under the direct influence of Grotius, Pufendorf and Thomasius. Worst of all, neither Kant nor Pufendorf had any real understanding of classical natural law. “Or was it not fateful that Pufendorf was well acquainted with scarcely a single Greek or Scholastic, and that Kant, the watershed from which flow so many and such varied streams of modern thought, knew Aristotle and St. Thomas only from a very imperfect history of philosophy?” (Rommen, 2007, p. 85). This was indeed an “extremely fateful fact.” Leibniz’s critique of Pufendorf can be found in *Natural Law and the Theory of Property: Grotius to Hume* (Buckle, 2014, p. 55) and *The Natural Law: A Study in Legal and Social History and Philosophy* (Rommen, 2007, p. 88).

did not drift apart. In modern times, Hobbes, who emphasized the distinction between *ius* and *lex* (Hobbes, *Leviathan*, 1.14), distinguished natural rights from natural law, which became no more than a theoretical guarantee for natural rights. With the substantive theory of natural law on the wane, when talking about natural law, people were in fact talking about natural rights. Thus, natural law (*lex naturalis*) evolved into natural rights (*ius naturale*), or to say, natural law was replaced by natural rights, which marked the ultimate victory of “anthropolodicy.” After the American Revolution and the French Revolution, natural law as a disguise was dropped and natural rights were openly pursued. In particular, the right to self-preservation became an unconditional and absolute basis of natural law (Strauss, 2003, p. 185; Hobbes, 2003, p. 8, p. 15)—(Never expected) the quality of thought degenerated to such a point. Blaise Pascal said, “Doubtless there are natural laws, but this fine reason having been corrupted, it corrupted everything” (Pascal, 2004).

The result or manifestation of the corruption of reason is that “law” becomes “right” and that “nature” becomes “world” and “resources.” Once rational natural law is faced with widespread skepticism, the entire world of thought will fall into a new round of skepticism, historicism and nihilism, which again need to be remedied by a newly emerged “new natural law.” Natural law itself is in an “eternal cycle” or perpetual transition. As Heinrich Rommen put it, “Yet it has always come back into jurisprudence whenever the human mind, weary of the unsatisfying hunt for mere facts, has again turned to metaphysics, queen of the sciences” (Rommen, 1998, p.28)<sup>①</sup>. In this regard, we are far less optimistic than Rommen was, as the many revivals of natural law in history were not Nietzsche’s *ewige Wiederkehr*, but Schmitt’s *absinkende*.

The revival of natural law in modern times may end up being a game of self-deconstruction without full awareness of its problems. This game, along with modern relativism, cynicism, historicism, skepticism and nihilism, forebodes mankind’s spiritual decay. Against such a backdrop, a re-examination of classical natural law is not necessarily a “sovereign remedy,” but it can at least temporarily break the spell of *ewige Wiederkehr* and allow natural law to truly return to nature in the cosmological sense. Only in this way can treatment, redemption or other alternatives possibly be found.

① Its original German version is entitled *Die ewige Wiederkehr des Naturrechts* (Leipzig: Verlag Jakob Hegner, 1936), whose literal translation into English should be the *Eternal Recurrence of Natural Law*.

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*(Translator: Wu Lingwei; Editor: Xiong Xianwei)*

# *The Outsider Perspective: Classical Chinese Philosophy in the Narrative Framework of the European Enlightenment*

Fu Chun

Sichuan Academy of Social Sciences

Wang Shuguang\*

University of Newcastle

**Abstract:** The purpose of this article is to enhance the understanding of how Classical Chinese Philosophy has been interpreted and transferred by Enlightenment thinkers into the narrative framework of European philosophy as a far-reaching source of ideas and inspiration with a driving force for promoting modern European social change. We examine outsider perspectives within the context of Enlightenment thinking that contributed to advances in the cross-cultural understanding of how Chinese stories could be disseminated in the framework of East-West dialogue.

**Keywords:** Classical Chinese Philosophy, the narrative framework of the European Enlightenment, humanism, rationalism, liberalism, secularism, Eurocentrism, cross-culture

**DOI:** <http://dx.doi.org/10.19873/j.cnki.2096-0212.2021.02.006>

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\* Fu Chun, Sichuan Academy of Social Sciences, University of Newcastle; Wang Shuguang, Center for Cross-Cultural Studies, University of Newcastle.

This paper is funded by the National Social Science Foundation of China “Research on narrative strategies in cross-cultural contexts (17XXW008).”

Correspondence concerning this article should be addressed to Fu Chun, Sichuan Academy of Social Sciences, Sichuan. E-mail: fuchunlili@yeah.net.

## Introduction

The European Enlightenment in the 18th century drew inspiration from Classical Chinese philosophy that contributed to the transformation of the Western world into a modern society and also influenced the rise and development of today's Sinology. However, there has been only limited study on how Enlightenment scholars integrated classical Chinese ideas into their evolving mindsets thus improving their understanding of human conditions and the promotion of social progress (Jonathan, 2013; Dawid, 2018). Demonstrating how the ideological dimensions of Western theoretical traditions have been adopted to interpret Oriental classical theories offers profound theoretical significance for deepening the understanding of the cross-cultural communication of Chinese stories in the East-West dialogue.

## Historical Context

In the second half of the 17th century and the 18th century, European capitalism began to emerge and develop, and Enlightenment thinkers felt an urgent need to abandon the medieval ideological traditions supported by theology. They wanted to bring about social changes by promoting humanism, rationalism, and liberalism, and to better understand human conditions and effectuate secularization. To foster the development of European industrial civilization, the separation of church and state was therefore highlighted. The strong religious overtones in ancient Greek and Roman intellectual traditions, and the traditional philosophical conceptual framework rooted in Europe at the time were not adequate to meet the new needs of Enlightenment development. Therefore, it was necessary to look for ideas and inspirations from a wider perspective, outside the limited scope of Europe (Dawid, 2018). It was at this time that classical Chinese philosophy became a significant component of the communications between European philosophy and Chinese thought. Therefore, it is necessary to look for inspirational resources outside Europe from a broad perspective. Classical Chinese philosophy provided a particularly significant means for the Western discovery of China. As John Marenbon stated, in the field of intellectual history, the discovery of China during the 17th and 18th centuries was no less important for the inception of modern Europe than the discovery of America in the 16th century (Dawid, 2018).

In the 16th and 17th centuries, Christian missionaries returned to Europe with large quantities of classical Chinese texts and Enlightenment thinkers were profoundly influenced by the philosophies embedded in these writings, many of which were promptly translated and published. For example, *The General History of China* edited by Jean-Baptiste Du Halde (1674-1743), one of the representative examples of the compilations and translations of ancient Chinese classics that included such works as: *Zhu Xi*, the *Book of Changes (Yijing)*, the *Book of Documents (Shujing)*, the *Classic of Poetry (Shijing)*, *Great Learning (Daxue)*, *Doctrine of the Mean*



(*Zhongyong*), and the *Analects (Lunyu)*. These compilations provided an almost encyclopedic coverage of classical Chinese texts (Dawid, 2018). Although Europeans at that time lacked a concrete understanding of China, from these works, the main spirit of Chinese philosophy had become available to Enlightenment scholars (Jonathan, 2013) who adopted and utilized the perspectives of classical Chinese philosophy as a source to tell a Chinese story tailored to meet the needs and terms of the European Enlightenment.

### **Traditional Western Theoretical Dimensions of Interpreting Foreign Ideas**

Among the different versions of the European Enlightenment in thoughts, appeals, introspections and criticisms, there are at least four main theoretical dimensions that play a key role in guiding Enlightenment thinkers to interpret foreign ideas as outside “the other.”

#### **The Dimension of Humanism**

As reviewed in the mainstream resources (e.g. Stanislav, 2018; Bullock, 2012; Dawid, 2018), Enlightenment thinkers were keenly aware that the Confucius thoughts explained in the representative works of Chinese Confucius philosophy such as the *Analects (LunYu)*, *Great Learning (DaXue)* and *Doctrine of the Mean (ZhongYong)* were purely derived from natural reason. In accordance with Confucian ideas, it might be said that the morality of Confucius is infinitely sublime yet still simple, reasonable, and derived from the purest sources of natural reason. Surely, never had a mind lacking the light of divine revelation appeared and developed a philosophy with such force and significance as Confucian philosophy. From the perspective of humanism during the Enlightenment period, these ideas not only shaped and fostered the Chinese Confucian culture, which is devoid of religious elements, but also stressed the value of humans as the first ruler of the world with its emphasis on benevolence and humaneness. The Enlightenment thinkers gave high recognition to the Confucian idea that the utmost happiness of mankind lies in the perfection of natural reason, viewing Confucian philosophy as a model for human thought.

As a leading figure of the French Enlightenment, François Arouet de Voltaire (1694-1778) wrote in *An Essay on Universal History, the Manners, and Spirit of Nations*, that Confucianism has a typical humanistic tendency and treats people’s achievements and interests with a human-oriented attitude, instead of judging them by theological criteria (Sweetman, 1999). From Voltaire’s perspective, Confucian ethics embody the view that mankind is the center of the universe and that the most essential discipline in China is ethics. For Chinese people, the things that are most profoundly understood, carefully cultivated, and being constantly improved are morality and law (Voltaire, 1999, 2016). Gottfried W. Leibniz, a prominent German mathematician and natural philosopher, spoke highly of Chinese ethics as well. In his eyes, China had not only admirable standards of morality, but also naturalistic philosophers. Leibniz

once argued that none of the Europeans believed that there was a better way than Chinese ethics to guide human beings to live in the world, and that although Germans regarded themselves as the most advanced nation, now China, an Eastern country, had enlightened them (Temple, 1963). Francois Quesnay (1694-1774), a French physician who had laid the foundation of the Physiocratic school, also believed that it was the observance of the laws of nature advocated by Confucianism that brought about the sustainable development and prosperity of Chinese society. He thought this stress on the natural law resulted from Confucian ethics marked by the tendency of atheism. In his view, it was quite necessary for Westerners to use Confucianism as a tool to guide their inner spirits, as well as to restrain the abuse of power by religious systems. The German Enlightenment thinker Christian Wolf (1679-1754) also held the idea that the ancient Chinese believed in natural reason, as they neither knew the existence of a Creator, nor had a nature-based religion, let alone writings of the light of revelation (Larrimore, 2000).

### **The Dimension of Rationalism**

What greatly impressed the Enlightenment thinkers was the concept of “rational” social governance in the pre-Qin period of China. It seemed that this concept was able to help them build the “ideal state” in Europe. For example, Voltaire believed that in practice, Confucian philosophy emphasized the role of natural reason (which highlights human relations and social governance), rather than a supernatural divine power, in exploring the existence of the world and the meaning of life (Voltaire, 1990). The French philosopher Denis Diderot (1713-1784) directly commended that Confucianism, for its use of reason, instead of religion, should govern the country. Additionally, from the perspectives of metaphysics and Deism, Wilhelm Leibniz (1646-1716) believed that Confucian concepts such as *li* (rational principle), *taiji* (the supreme ultimate) and *wu-wei* (non-action) were naturally rational. Therefore, he advocated that Europeans, who had deep-rooted religious traditions, should incorporate such natural rational elements into their Christian beliefs so that they could accept knowledge and science in the process of secularization (Willy, 1990). Likewise, Heinrich Diefrich (1723-1789) held the idea that European governments should regard China as a model, as it was the only country in the world that combined political governance, Confucius education and moral behavior. In his eyes, political and economic systems should be the embodiment of morality in the field of social management (Dawid, 2018; Shen, 1985). These points are what European Enlightenment thinkers construed from classical Chinese philosophical thoughts. They were in line with Enlightenment thinkers’ rationalist thoughts, and, with their great practical significance, served as a complement to the Europeans’ original conceptual framework.

### **The Dimension of Liberalism**

Voltaire showed a particular interest in the meaning of freedom in Confucian philosophy. Voltaire noted that in China, a country of natural Confucius spirit and free from religious

autocracy, people enjoyed full freedoms of belief, of choosing a career, and of establishing settlements (Larrimore, 2000). By revealing ancient China in this way, Voltaire was actually exposing the absurdity of European religious intolerance in a relatively safe academic context provided by European missionaries who had just returned from China. He wanted to find a new way to advocate for the advancement of science and liberty in Europe. In this sense, it is not an exaggeration to say that Voltaire's propaganda about the image of China is a direct advocacy of the value of freedom. On the other hand, as Willy (1990) believed, the long history of China, and the good laws and tolerance of religion in pre-Qin society would also shed light on the liberalistic significance of science and reason being supported by Confucian ideals.

Besides, according to Christian (2019), the *Wu-wei Er-zhi* ("govern by doing nothing that goes against nature") thought in Taoism, a classical Chinese philosophy, had become a typical example of the interpretation given by European Enlightenment thinkers under the influence of a liberal mindset. European intellectuals were generally convinced of the existence of an endogenous Chinese model of *wu-wei*. This conviction greatly supported the theoretical assertion made by Francois Quesnay's laissez-faire economics of physiocracy: In order to achieve the state of "peace and harmony" advocated by Confucianism and Taoism, and develop a prosperous agricultural culture, the governor should organize society and engage in production in accordance with the idea of *Wu-wei Er-zhi*. As Quesnay stressed, the key idea of *Wu-wei Er-zhi* was not "doing nothing," but letting the natural laws rule and the abandoning of too many interventions. Under the initiative of Quesnay, the liberal economic ideology of some European countries started to move away from the interventionist mercantilism of Europe and towards the Chinese concept of "natural order." According to Christian's (2019) research, this Chinese agricultural concept of *wu-wei* was successfully combined with the traditional Swiss business model, which made Switzerland the earliest paradigm of *Wu-wei Er-zhi* in Europe. This combination strongly indicates that European liberal economy did not result purely from local thought. At least, in terms of Switzerland, its success benefits from the effective practice of the revisions and application of the essence of classical Chinese thought, *wu-wei*.

### **The Dimension of Secularism**

While seeking for the secularization of society, European Enlightenment thinkers noticed that, in the Far East, there was a country named China with a reliable chronicle of its long history and people who had never heard of the biblical flood. Apparently, knowing the Chinese chronology cast doubt on the Western chronology based on the *Bible* (Dawid, 2018). As a consequence, this knowledge undermined the authority of Christian doctrine and had a great impact on Christian ideology, which was regarded by Westerners as the only original, legitimate and divine system of thought. The chronicle of China has also shown that, without the Christian faith, ancient Chinese people could also make extraordinary accomplishments in the fields of medicine, botany, pharmacology, architecture, music, painting, sculpture, and

Chinese inventions (Chinese compass, print, gunpowder, etc.). Even in the field of mathematics and astronomy, ancient Chinese people had great attainments. All these facts relativized Christian heritage (Vossius, 1685).

In the eyes of Enlightenment thinkers and Jesuits, Confucian ethics' focus on education blazed a trail for harmonizing family, society, the imperial examination system, and political life in a natural way dependent on rational moral education. In this oriental picture, people work and live according to ethics and the natural laws instead of instructions revealed by God directly to religious authorities. In conclusion, it was such historical practices, without God's interventions, that represented an ultimate accomplishment of human reason in the field of morality (Labrunet, 1688). Dawid (2018) offered a long list of famous Enlightenment thinkers who held such views: Temple (1963, p. 114) believed that "the highest happiness of all humanity lies in the perfection of natural reason;" Nicolas Fréret thought Confucianism held the clues for making all humanity happy, and hence it should be universalized; Sweetman (1999) even argued that the natural order revealed by Confucianism should be the supreme principle of all human legislation, and of all political, economic, and social behaviors. As for Voltaire (1999), he believed that in China's long historical tradition, the natural religious spirit of Confucianism is linked to the moral perfection of mankind. Long before the Westerners had written languages, the Chinese had been able to record their history consistently by a fixed language. As pointed out by Ankersmit (1983), Gottfried Wilhelm Leibniz had provided another explanation for naturalist ethics. Leibniz believed that the so-called *tian-ming* (destiny), *tian-dao* (natural order), and *tian-yi* (act of heaven) are the natural laws obeyed by humans in the universe, and that the Chinese understand the world without the inspiration of God. This is a point that Leibniz gave the Jesuits to consider in seeking an alternative to secularization. In conclusion, the Enlightenment movement's attitude towards religion cannot be simply equated with moving towards secularization. On the contrary, in the dimension of secularism, Chinese culture and the Confucian ethic spirit were an inspiration for the Westerners, helping them find the accurate expression of thoughts during the process of religious reform after the Western Enlightenment thinkers introduced Chinese culture and Confucian ethics to the Western world.

## **Cross-cultural Anthropological Perspective for Interpreting Outsiders**

### **Criticism of Common Sense**

During the 15th, 16th and 17th centuries, when the Great Geographical Discoveries continuously brought expanded knowledge of China, India and the Islamic countries, the European concept of "humanity" was greatly enriched and improved. Moreover, the laws, social systems, philosophies, economic phenomena, cultures and customs from outside countries, presented in what we call ethnographic materials today, have greatly aroused doubts about

the Eurocentric “common sense” constructed by religious authority and many hidden powers. It is the introduction to classical Chinese ideas that inspired Enlightenment scholars to adopt the perspective of cross-cultural communications, and provided important anthropologically critical perspectives for them to discover the philosophies of the outside world.

The significance of understanding these foreign beliefs, life experiences and developed knowledge on the ethnographical level could be to thoroughly examine “common sense” and the reflecting Western models that underly cultural prejudice, solidify values and create stereotypes through new lessons learned from “the other,” from different life-histories and diverse cultures. Western Enlightenment scholars discovered a challenge to Western religious systems from the Confucian ideals in classical Chinese thoughts through the large numbers of Eastern texts, artworks and symbols. More specifically, from the Enlightenment of Chinese chronicles, Confucian natural ethics and social relations, and the natural rationality and laws of *Wu-wei Er-zhi*, Europeans saw the limitations of their self-centeredness, the great faults in Christian sacred history, and the necessity of religious secularization (Israel, 2006). The conversation between ancient Eastern philosophy and early Western Enlightenment, which was based on self-reflection and self-criticism related to the Western religious system and common sense, provided to be an important source of ideas for the modernization of Europe, for self-reconsideration and criticism of the common sense derived from the Western religious system.

### **Criticism of Eurocentrism**

Enlightenment scholars, from an anthropological perspective, held that Christian missionaries and they themselves, although highly accomplished, were also potentially motivated to adopt the point of view of Eurocentrism as a traditionally engaged device based on their own history and ideology when examining and interpreting other civilizations, no matter how impartially they tried to read and understand classical Chinese ideas. For this reason, Voltaire critically pointed out in his important work *An Essay on Universal History, the Manners, and Spirit of Nations*, that the tendency of centrism in Western epistemology would greatly influence Westerners’ understanding of foreign knowledge, experience and values (Vukovich, 2012). Additionally, the Western academe’s desire to understand Eastern thought was based on “a Baconian paradigm of Western knowledge-centered power,” not because the Eastern traditions themselves were worth knowing, and this desire was based on Westerner’s own standards and for their own sake (Said, 2003). First, this caused Westerners’ understanding of Chinese stories to be highly subjective. For example, Enlightenment philosopher Giambattista Vico (1668-1744), who adhered to a Eurocentric view through which to judge historicity, regarded Chinese chronology and natural ethics as unreal myths which could only exist in texts (Vico, 1948, p. 61). Voltaire believed that in the framework of Eurocentrism, the real history of China as the oldest nation in the world would be ignored (Willy, 1990). However, the actual existence of classical Chinese thought was a notice from oriental wisdom about the necessity of a better



system and customs to broaden Westerners' knowledge. Although Westerners may never be able to completely understand a foreign culture from a bird's eye view, it still allowed them to go beyond their limited horizons. Cross-cultural comparisons, from many perspectives, helped Westerners adopt pluralism and enabled them to understand the existence of humans from different cultures as being within the scope of humanity (Vukovich, 2012).

### Cross-cultural Criticism of Translation

Philosophy, as an academic discipline, has been to a great extent defined by concepts of Anglo-European languages and discussions. In this sense, for Westerners in the Enlightenment period, scholars had very few resources from textual studies, discourse studies, narratology, religious ethics or archaeology to help them capture and understand the complex concepts in classical Chinese texts, such as *li* (principle), *qi* (material), *taiji* (the Great ultimate), *dao* (the Way), *li* (rites), *zhong-yong* (moderation), *tian* (universe, god), and *tian-ren-he-yi* (man is an integral part of nature). Moreover, Eurocentrism, as a powerful discourse is always socio-culturally embedded. Particularly, the asymmetry of Eastern culture and Western Christian culture has placed an observable subjectivity in European's interpretations of Chinese texts. Many Enlightenment scholars were keenly aware of this. For example, Leibniz, Voltaire, and Quenay all believed it was a naive approach to adopt a dualistic view of "center-edge" in the interpreting process of Chinese texts. This would lead to subjectivity in understanding the uniqueness and intrinsic value of "the other" culture, whether inadvertently or intentionally, facing the risk of improper assumptions and understandings. In their view, the interpretations of classical Chinese texts should be premised on the critical understandings of their own culture in the cross-cultural communications (Willy, 1990). Therefore, they must go beyond word-for-word translation within their framework of understanding, and look for more resources for dialogue to facilitate communications.

Leibniz's defense of Matteo Ricci (1552-1610) pointed out several reasons why Matteo Ricci was very close to the spirit of classical Chinese texts. First, he had spent most of his life in China, which enabled him to speak southern Chinese dialects fluently. Secondly, he had extensive contacts with Chinese people from various social classes. What is more, he could interpret the *Analects* (*Lunyu*), the *Tao Te Ching* (*Daode Jing*) and the *Zhuangzi* in multiple languages. Similarly, Leibniz himself refused to understand China simply by reading translated documents. In fact, he chose to investigate China through the large number of reports and letters sent back by Christian missionaries, the works published by the Jesuits involved in Chinese society, his discussions with translators regarding the cultural backgrounds of Chinese rhetoric, and the visual symbols of Chinese artworks and other Chinese specialties, such as Chinese tea, silk, porcelain, and traditional Chinese medicine (Leibniz & Wolff, 1992). Leibniz, as an Enlightened thinker, was good at critical cross-cultural thinking. Although the historical resources available to him were not really sufficient, he used the limited resources available to



him to let his understanding resonate with Eastern thoughts (Dawid, 2018), and then tell the Chinese story in a philosophically dialogic way.

## Conclusion

The sufficient contents in classical Chinese texts with their many and varied ideas were actually beyond Enlightenment thinkers' understanding. In addition, Western philosophers strove valiantly to grasp the fundamentals of classical Chinese philosophy but ended up, in the main, merely mirroring their own prior obsessions. Despite this, drawing on great experience in the exploration of the spiritual world the classical Chinese philosophic ideas, as an important intellectual resource and a great mining of wisdom, were extensively adopted and did facilitate the Enlightenment movement, especially when it was installed in the narrative framework of the European Enlightenment. Taken a step further, these classic philosophies have been shaped into the various European versions of tools which were modified and adopted by Enlightenment thinkers such as Matteo Ricci, Leibniz, Voltaire, Quenay, Diderot, and Wolf for their cross-cultural self-reflection and self-criticism. The most enlightening point is that, to promote and uphold the essence of the classical Chinese spirit, making it as shiny as how European culture now appears to the rest of the world, it is necessary to acquire a Chinese narrative which can be widely expressed in the cross-cultural communication dimension, within the "outsider" narrative framework. Only in this way can the classical Chinese spirit become an intellectual resource that can be shared by all mankind and contribute to the understanding of human survival values, meanings and prospects.

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(Editor: Gerald)

# *Analyzing Innovative Features in Higher Education in Israel*

Xu Shihong\*

Sichuan Institute of International Science and Technology Collaboration (Israel)

**Abstract:** Though starting late, Israeli higher education has made fruitful achievements, owing much to the innovative thinking ideology in education. This innovative spirit is reflected in the traditional concept of Jewish education, high investments from government and society, the problem-driven features of the education process, and a comprehensive focus on the industrial transformation of research products. In terms of cultivating innovative talents, sound scientific and technological plans, effective guiding mechanisms, unique research learning modes, organic integration of innovation and entrepreneurship education, and innovative measures of military education contribute to an excellent environment and a platform for cultivating students' scientific research and entrepreneurial abilities. The rich content of entrepreneurship and professional education, and the driving effect of the national military service system reflect the innovative features of higher education in Israel and offer positive reference value for the reform and development of innovation and entrepreneurship education in China.

**Keywords:** Israel, higher education, innovative features

**DOI:** <http://dx.doi.org/10.19873/j.cnki.2096-0212.2021.02.007>

Israel's higher education dated back to the Jewish community in Sicily, Italy in 1466, where the desire for a modern university was first born (Troen, 1992). It was not until the creation of the Hebrew University of Jerusalem and the Israel Institute of Technology in the 1920s that a truly modern university was proclaimed. Since then, Israel has established seven universities, all of which have basically followed the educational model of

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\* Xu Shihong, Sichuan Institute of International Science and Technology Collaboration (Israel).

Correspondence concerning this article should be addressed to Xu Shihong, Sichuan Institute of International Science and Technology Collaboration (Israel), Chengdu. E-mail: 913094003@qq.com

German meritocracy, emphasizing that universities are research institutes and should integrate education with research (Rozenblit, 1993). Even today, when education has become popular in Israel, universities have retained their focus on scientific research after a modest expansion.

The responsibility for expanding undergraduate education lies with a number of community colleges, normal colleges and open universities. There are three main reasons for this phenomenon. One is that the main founders of Israeli universities are Jewish. The Jewish people always follow the culture and education tradition of their religious classic *Talmud* and pay attention to learning and innovation. The second is that the German Humboldtian model is recognized in the process of setting up a university, and the representatives of the cultural Zionism, Ahad Ha'am and Chaim Weizmann, believed that "A university should be a research institute rather than a vocational training institute" (Hao, 2019, p. 11). Third, the university sponsors also require universities to pay attention to scientific research. The Rothschilds of France, for example, insisted that a university be set up as a research institution and claimed they would not fund normal universities. Therefore, Israel's higher education started late, but has achieved fruitful results. In only a few decades, Israel has transformed itself from a "small agricultural country" in 1948 to the most industrialized and economically developed country in the Middle East, ranking among top developed countries, and creating a miracle of economic development (Zhang, 2015). The success of higher education in Israel has not only cultivated a large number of scientific elites in science and technology, but also provided a practical reference for the reform and innovation of higher education in China with its unique education concept, education strategy and teaching content.

### **Innovation Concepts in Education**

The success of Israel's higher education owes much to the success of its traditional Jewish education, especially *The Hebrew Bible* and *Talmud*. In the 4th century, the archbishop of Constantinople, John Chrysostom, put all holy books under the name of "Bible." Since then, in order to maintain their own unique religion and culture, the Jewish people read the *Bible* (Old Testament) through educating children to continue the lifeblood of the Jewish people. The *Talmud* currently has over 2.5 million words in 12,000 pages across 20 volumes (Le, 2009, p. 50). It is the essence of the wisdom of the Jewish people. In Israel, one of the core elements of the national education is religious education. Religious education "requires all man to follow the same path to the wisdom of the Lord" (Yao & Chen, 2013, p. 227), and testimonies refer mainly to the *Bible* and the *Talmud*. For thousands of years, the *Bible* and the *Talmud* were the source of persistent Jewish wisdom, guiding Jews to get out of suffering again and again, and gradually forming the Jewish world view that became the living standard and moral culture that underlies Jewish culture. The studies of the *Bible* and the stories of the *Talmud* reveal that an important feature of the Jewish education concept is to cultivate children's critical and innovative thinking, (Xiong, 2014, p. 126). Jews believe that education is not only to teach children knowledge, but also to cultivate

their ability to create the future, which means the ability to innovate. The Christian tradition of education, represented by Socrates, holds that knowledge is to be discovered, and education is the proper intellectual discipline. Different from this, Jews believe that knowledge is produced, and that learning should be based on thinking and driven by practice (Block, 2011, p. 24), instead of being a pedant who only knows knowledge but does not know how to use it. It was this spirit of creating the future that restored the Jewish nation. That made Israel, a small country of about 9.2 million people, among the world's leading technology powers. The innovative nature of education in Israel is mainly embodied in the following four aspects.

Firstly, the origin of Jewish education embodies the spirit of innovation. In 586 B.C., Nebuchadnezzar II of the Neo-Babylonian Empire occupied Jerusalem. Thousands of Jews became "Babylonians," including priests, nobles, artisans, and even members of the royal family. The collapse of the Jewish kingdom and the displacement of the Jewish people brought a religious and cultural crisis to the Jewish people. It was also "in such extraordinary times that Jews began to remember the teachings of the prophets" (Zhang, 1998, p. 109). Holy sites, temples and shrines no longer existed, and religious leaders persevered in maintaining the national traditions in order to reunite their fellow citizens under the banner of the Jewish religion. In addition to the compilation of the words of the prophets, synagogues emerged. People, no matter rich or poor, could meet in the synagogues, worshiping and listening to the sermon regardless of time, place, or rank. The adaptation from temple sacrifice to synagogue recitation was the practice of Jewish religious classics. It was this innovative adaption that helped the Jewish people maintain their religious integrity and cultural inheritance during their two-thousand-year migration and exile. In the 3rd century B.C., at the request of the public, primary schools were opened in the synagogues, thus creating an era of Jewish education. Flexibility, or innovation, played an important role in the subsequent cultural struggles against the onslaught of Greek civilization and the rule of the Roman Empire. Israel's greatest sage, Rabban Gamaliel, eventually established the Jewish education model for posterity by hosting colleges, training teachers and compiling Mishnah. This model was later documented and demonstrated in the *Talmud*. The development of Jewish education is characterized with the development of family education and religious education, drawing on the Western education model, and ensuring the survival and inheritance of its people by maintaining Jewish spiritual values. Education, which is based on the special reality of national destiny, has embodied the spirit and thinking mode of innovation from the very beginning.

Secondly, the high investments in education in Israel emphasize scientific research and innovation. Since the founding of Israel, education has always been regarded as the most effective investment in the future of the country and the fundamental guarantee of national and ethnic development. Prime Minister of Israel Netanyahu commented that Israel had the harvest of unprecedented investments and efforts in the university of science and technology, and that the country would continue to strive to build itself into a high-tech power. They were investing 7 billion shekels (\$2 billion) in the cutting-edge projects of universities and the Israeli government

continued to invest heavily from preschool education to higher education (Xue, 2013).

Thirdly, Israeli higher education's issue-driven features promote innovation education. Israeli universities not only undertake the task of personnel training, but also the task of basic research. One of the characteristics of its scientific research is to explore the frontier of science and technology from the perspective of its own problems. For example, Israel is short of natural resources, especially water resources. Since its founding, the protection and development of water resources have been the top priority. Therefore, it promotes research on water-saving agriculture, desert governance, solar energy, software development and other related fields. Also, Israel has developed the world's most powerful military technology for national security. The implementation time of Israel's compulsory military service is after graduation from high school. Through two years of service, Israeli college students accumulate considerable practical experience when they are enrolled in colleges and universities, and they can often put forward very practical problems for study and research. In addition, there is a kind of "computer service" in Israel, in which the chosen ones must do military service for one more year to acquire advanced practical computer knowledge. This is an important reason why Israel is called the "New Silicon Valley."

Fourthly, the industrial transformation strategy of Israeli scientific and technological achievements has stimulated innovation practice. In Israeli universities, the results of scientific research can be quickly transferred to industrial development. This is good for the cooperation between technology companies and universities. The company is fully responsible for the patent application, technology transfer and external technical services of the university's scientific research results, and it also seeks partners in the industry sectors for the university's research projects, who introduce research funds and venture capital. The company operates independently and accounts independently, and its profits are distributed among the company, the university, and scientific research personnel. The advantage of this mode is obvious. It saves the university researchers from spending time and taking investment risks in the transformation of scientific and technological achievements to industry. It also brings timely material rewards to the university researchers. For universities, this practice can effectively mobilize the initiative of researchers and combine scientific research with teaching practices, which not only promotes the progress of scientific research, but also improves the quality of teaching. In particular, it provides real practice opportunities for cultivating students' abilities in innovation and entrepreneurship. The establishment of university-technology-transfer-company has brought benefits to students, teachers, universities, industry, technology companies and researchers, as well as more tax revenue for the country and more wealth for social and economic development. Therefore, such measures as technology transfers, technology services and joint-stock systems of cooperation have promoted the improvement of scientific research in Israeli universities and brought the transfer of scientific research and achievements into a positive cycle of mutual promotion.



## **Education Strategies for Innovative Talent Cultivation**

Israel regards education as the wealth of society and the key to creating the future (LeVi & Ragonis, 2015). Relying on innovative talent cultivation to stimulate national innovation vitality, it has formed a unique innovative talent cultivation strategy and education system and mechanism. As a survival skill, innovative thinking is not only reflected in family education, but also integrated into the daily activities of university teaching as an education goal. Education strategy is embodied in the following aspects.

Firstly, a core content of the Israeli innovative talent training system is to improve the scientific and technological plan, form an effective guiding mechanism, promote close cooperation among industry, universities and research, and improve the research and development level of society (Zhang & Zhang, 2011). To promote innovation in Israel, the government, schools, enterprises and research institutions work together to build a platform for the cultivation of innovative talents. The specific measures include: First, Implementing the chief scientist responsibility system, helping society and enterprises to carry out commercial research and development on behalf of the government, promoting the development of new, high technologies and providing risk funding for scientific and technological personnel to realize the transformation from innovation achievements to product industrialization. Second, Establishing the chief scientist forum. Chaired by the Minister of Science and Technology, chief forum scientists are appointed to the various government departments. The main responsibility of forum is to explore major measures to improve the national innovation system, discuss major issues of science and technology innovation policies, prevent each department from isolation, overcome possible defects caused by multi-supervised management, and avoid the duplication or omission of science and technology projects. Third, Setting up numerous research institutes and R&D centers. Some function as government agencies, managing national research on innovative industrial products and applied technologies, while also serving as liaison agencies for Israeli participation in the Eureka Project, which is a high technology development plan proposed by 18 countries of Western Europe. The other part of the centers coming from enterprises and local R&D centers, together with the seven research universities, National Professional Academy of Agricultural Sciences, national research institutions, hospitals, non-profit organizations fund by the government for innovation, and risk investment institutions, constitute the active main body of the Israeli national innovation system. These agencies and institutions coordinate their research and developments, from laboratory to market, with the technology transfer companies to transform scientific research achievements into industry products. This kind of all-around scientific research training, experiment and transformation provide the students' innovation practice with efficiency and guarantee.

Secondly, research-based learning is advocated in higher education in Israel. In the eyes of Israelis, knowledge is not static, and many questions are posed without right answers. The core of research-based learning is to develop students' ability to find problems and infer solutions from

them. “What knowledge is most valuable?” Herbert Spencer raised the issue in 1860. The Western society, represented by the US, established education in accordance with a trading system, expecting every student to spend time, effort and/or money in exchange for their education. In this case, knowledge is viewed as an exchange quotient.

Education has evolved as a tool for social stratification. But in Israeli higher education, where Jewish education is the main feature, teachers do not directly tell students the answers to the questions. Knowledge is acquired by students themselves in scientific experiments. Therefore, research-based learning is not simply an exchange of knowledge, but a verification of knowledge through the development of research activities. During research, new problems arise, and new methods are explored. In the same way, not only is the process of knowledge acquisition dynamic, but knowledge itself is also constantly updated. As an education strategy, research-based learning teaches innovative thinking. Students trained by research-based learning are constantly influenced by research activities and naturally developing the habit of innovative thinking. The skills and methods learned through research are also the basic preparation for carrying out future scientific and technological innovation practices independently.

Thirdly, another initiative of Israeli innovative talent cultivation is to develop special innovative education courses and integrate entrepreneurship education into the innovation cultivation system, so that the course content is rich and comprehensive. Taking the University of Bahia as an example. The international IMBA program, a dynamic education practical program, integrates multiple academic elements including internship, special skills training, imitating “entrepreneurial” economics, and informal courses. The program takes global management as its academic core. In addition to basic knowledge courses such as finance, micro/macro-economics and mathematics, it also offers courses such as “cross-cultural negotiation,” “international business policies” and “business management under the global competitive environment.” The course also offers English courses including communications and rhetoric. Students will attend a series of lectures by Israeli business elites and visit “entrepreneurial” enterprises, including financial institutions and nanotechnology-driven solar energy enterprises. During the study period, students are required to do internships in startups. In addition to the formal studies and sightseeing there is a constant focus on special “informal education activities” in the IMBA program. Students from all over the world, including North America, Europe, Africa, Australia and Asia can come together, study together, communicate and progress together in a relaxed and enjoyable learning environment, both in class and after class.

For the Israel Institute of Technology, innovation and entrepreneurship curriculum materials reflect the characteristics of accurate supply, practical teaching focused on the integration of knowledge acquisition with real experience, external resources to assist the whole process of innovation and entrepreneurship education, and the application of pragmatic values in innovation and entrepreneurship education (Zhou, 2019). At the micro level, Israel Institute of Technology has integrated an appropriate entrepreneurship education philosophy with a basic system with

continuous research and development, and the constant improvement of the entrepreneurship education curriculum as well as the acquisition and retention of a highly professional faculty. At the meso level, it vigorously supports and promotes the improvement of entrepreneurship education organizations. At the macro level it strengthens the cooperation among universities, industries, governments and all sectors of society to create a comprehensive cultural atmosphere for entrepreneurship education (Li, 2019).

Finally, Israel has put creative integration of military education into the national education system. In Israel, mandatory universal military service is implemented. All Israeli citizens aged 18 years and over, male or female, shall perform military service, with possible exceptions for physical and religious reasons. Soldiers serve between 24 to 32 months depending on gender, age, and professional training. After their term of active duty, soldiers are transferred to reserve units which can assemble within 18 hours, be mobilized within 24 hours, and put into operation within 36 hours (Sun & Zheng, 2015). For the cultivation of innovative talents, the national military service system not only provides colleges and universities with high-quality talents with national spirit, but also the elite seeds that can adapt to the sometimes-harsh conditions of scientific research. Through compulsory military education, students are equipped with the qualities and abilities of collective thinking, independent thinking, a cooperative spirit, and self-reliance before entering colleges and universities. The existence of a military service reserve further promotes the development of lifelong education, which is additional evidence of education innovation in Israel.

### **Innovation Features in Entrepreneurship Education**

In Israeli universities, the content of innovation education includes the cultivation of entrepreneurial abilities. The education of the Jewish religion and the traditions of the Jewish culture are maintained, especially the creation and accumulation of wealth. Because of this historical tradition, Israel is able to survive in a hostile environment with few resources. The main reason for this is Israel's persistent pursuit of science and technology and its continuous enthusiasm and achievements in the form of entrepreneurship. In Israel innovation is for the development of scientific and technological achievements, for security and survival for the constant accumulation of wealth. It is not difficult to understand that one of the great things about innovation education is entrepreneurship education.

Israeli entrepreneurship education is an all-around cultivation of knowledge and abilities. In the case of the Hebrew University of Jerusalem's training program, the one-year internship program requires interns to work in a challenging and meaningful work environment for at least one day a week, completing academic tasks involving research, marketing, financial analysis and strategic planning. The students' task is to combine the professional theoretical knowledge with the market practice. Interns must return to school every two weeks for a three-hour seminar on the theory, difficulties and insights involved in their assigned projects. The internship

curriculum includes: how to enter the new environment; how to identify organizational culture and its impact on organizational processes; how to identify personal and cultural values; how to identify organizational practices that help improve innovation abilities; how to identify rights and innovation; how to identify social, individual and organizational changes; and learn organizational conflict management, as well as planning and implementation through cooperation. It is not difficult to see that such internship programs not only require the improvement of theoretical knowledge, but also require the application of theories to verify and summarize the practical processes. Innovation and entrepreneurship education and professional education have merged in Israel.

The entrepreneurship education of The Hebrew University of Jerusalem is also very informative. Students must distinguish between social entrepreneurship needs and social entrepreneurship visions, and explore innovation strategies for social entrepreneurship. Through this course, students not only learn the theories and paradigms related to entrepreneurship, but also how to define the theories and paradigms that will contribute to their future entrepreneurial success. In the learning process, social entrepreneurship and business entrepreneurship will be compared and analyzed. In addition, students will also learn the basic concepts of entrepreneurship, theories related to changes, blue ocean strategies, diffusion of innovation, distribution models and sustainable development. The entrepreneurship education of The Hebrew University of Jerusalem contains the interpretation and practice of innovation, which is quite different from the current understanding and implementation of innovation and entrepreneurship education in China.

Interestingly, Israel's universal military service is also a catalyst for entrepreneurship education. According to an investigation conducted by Shen Chaohong, Wei Chunxia and Cheng Fei (2015), the universal military service system is one of the direct factors influencing Israel's rates of startups and success. The MOS model provides an effective analytical framework, with M for entrepreneurial Motivation, O for Opportunity and S for entrepreneurial Skills (Lundstrom & Stevenson, 2005, p. 22). The analysis finds that compulsory military service affects entrepreneurial motivation, along with opportunities and skills, which in turn increases the rate of successful entrepreneurship. Shen, Wei, and Cheng (2015) indicate that the compulsory regular training in the compulsory military service system has stimulated soldiers' entrepreneurial intentions. The sophisticated military technology that soldiers must master during their military service helps to build entrepreneurial opportunities after their return to civilian life (Shen, Wei & Cheng, 2015). The reserve system sets up an interactive military platform for Israelis, helping to build interdisciplinary and cross-industry entrepreneurial opportunities. Resourcefulness and teamwork skills developed during military service are important entrepreneurial skills. Military service often deals with contingencies, which improves soldiers' abilities to improvise and helps them deal with uncertainties in their entrepreneurial activities. Teamwork in the army helps to build an efficient start-up team. In conclusion, the compulsory military service system, through

the high frequency and deep interactions of diverse subjects, acts on entrepreneurial motivation, opportunities and skills, thus improving the rate of entrepreneurial success.

### **Conclusion**

Israeli higher education is full of distinctive innovative features. The inherent innovative thinking in its education concepts, the unique education strategies for innovative talent cultivation, and the organic integration of innovation and entrepreneurship education all highlight the advantages of higher education in Israel and the reasons for its success. Israeli teaching styles, such as allowing questioning, encouraging new ideas, and promoting class discussions, are also very conducive to creating an innovative environment and encouraging innovation and entrepreneurship.

The formation of the innovation and entrepreneurship education system in Israel is a long process that has successfully integrated innovation and entrepreneurship education concepts with school education, military education and social education, to construct an innovation and entrepreneurship ecosystem covering all levels of society (Wang & Dai, 2019). The Israeli higher education model plays a significant role in encouraging and guiding the innovation and entrepreneurship reform in other countries.

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(Editor: Yan Yuting)



# *Analysis of the Focal Issues of the Implementation of the Block System Reform in China*

*—From the Perspective of the Protection of Civil Rights*

Zheng Ni\*

Law School of Sichuan Administration Institute

**Abstract:** In February 2016, the Central Committee of the Communist Party of China and the State Council of China issued the “Several Opinions of the CPC Central Committee and the State Council on Further Strengthening the Management of Urban Planning and Construction”, stating that, in principle, closed residential areas will no longer be constructed and will be replaced by the promotion of the block system. This change in policy has aroused a great deal of controversy in various circles of society in China. In 2017, Chengdu, the capital city of Sichuan province, made an innovative attempt to implement “small block regulations.” In 2018, the first “block system” public rental housing district appeared in Beijing, the capital of China. These innovative practices have promoted the pace of block system reform in China, but in general, the implementation of block system reform is difficult. From the perspective of public opinion, it seems that many citizens misunderstand the block system. This may be due to the complex interactions among community environmental management, public security, privacy, and other factors where individual interests and public interests meet. This article, from the perspective of the protection of civil rights, analyses the advantages and disadvantages of the block system at the value level, distinguishes the differences between the block systems of China, the UK and the US and then puts forward the theory that the block system reforms for newly built and existing residences are different and should be implemented independently. Concerning the key point of the block system reforms, the “greater difficulty in the implementation of the block system reform in the existing residential quarters” is the proposal to expropriate the commonly owned internal roads and appropriately compensate the residents. Finally, to cope with the core issues effectively, this article advocates gradual implementation of the block system reforms in China, including legislation, policy transformation, cultural construction, and pilot trials to promote the success of the implementation.

**Keywords:** the block system, civil rights, expropriate, policy transformation

**DOI:** <http://dx.doi.org/10.19873/j.cnki.2096-0212.2021.02.008>

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\* Zheng Ni, Law School, Sichuan Administration Institute.

Correspondence concerning this article should be addressed to Zheng Ni, Law School, Sichuan Administration Institute, Chengdu, Email: 344182132@qq.com

The CPC Central Committee and the State Council formulated and promulgated the “Several Opinions of the CPC Central Committee and the State Council on Further Strengthening the Management of Urban Planning and Construction” (hereinafter referred to as “the Opinions”) on February 6, 2016. the Opinions established the latest concepts and basic principles for urban planning and construction during the 13th Five-Year Plan period, which explicitly states: “New residences should promote the block system in principle, and closed residential areas should not be constructed any longer; residential quarters and compounds that have been completed should be gradually opened and the internal roads be made public to help solve problems in the layouts of the road networks, and to facilitate land conservation.”<sup>①</sup> The reforms promoted by the block system, once put forward, caused widespread concern from the public. The focus of controversy and discussion is the contradiction between the promotion of the block system reforms and the protection of civil rights.

With the rapid advancement of urbanization, the use of land has become an overreaching concern. Wide roads, large shopping districts and closed residential areas are constantly being built but they are not being efficiently integrated into the community and the public facilities are not being shared. Although the main roads in urban areas are getting wider and even eight-lane roads can be found here and there, the wider the main roads are, the smaller the number of feeder roads and the worse the circulation becomes. Hence the problem of serious traffic congestion continues to grow. In this context, the implementation of district system reforms is the key to solving this difficult problem. The block system can allow increases in the quantity of public roads and road network density, alleviate traffic pressure on the main roads, enhance the utilization rates of public transit networks, and improve the connectivity between pedestrian and bicycle transportation networks. This is why so many large cities in Europe and America have adopted the block system. However, to implement the block system the roads in the residential quarters need to be public. As a consequence, the added traffic would increase security risks and noise pollution for the residents. Opening the roads of the residential areas that have been completed does pose a great challenge on how to protect the rights of the occupants, especially their rights of privacy and their property rights. How to balance the pros and cons of the block system, distinguish the block system reforms for newly built residences from those that have been completed, and the available solutions in the implementation of block system reform are valuable research topics.

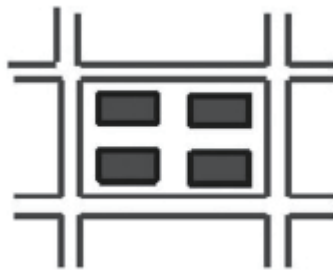
## Value Analysis — Advantages and Disadvantages of the Block System

### Advantages of the Block System

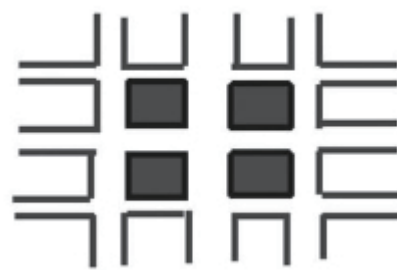
In the early 1970s, US urban sprawl emerged due to the popularity of private cars and

<sup>①</sup> Article 16 of Part VI of *Several Opinions of the Central Committee and the State Council of the CPC on Further Strengthening the Management of Urban Planning and Construction*.

suburbanization of community businesses. In order to solve the resulting problems of environmental pollution, traffic congestion and other issues, the planning idea of “new urbanism” came into being. The basic idea is to promote the construction of street networks, use walking distances as the starting point for planning various activities, and effectively combine the natural environment with the community.



*Closed block*



*Open block*

First, the block system can optimize land use. It is important for a populous country like China to improve resource utilization. It must make full use of the limited urban land by making as much land as possible a part of public's resources while also making life more convenient within the neighborhoods by opening enclosed communities and tearing down the visible walls. In addition, as sprawl often becomes the main mode in some cities as they develop, the amount of arable land is severely reduced. The block system, as an expression of a compact layout, can curb city sprawl to a certain extent.

Second, the block system can effectively alleviate the current traffic pressure. At present, the main problem in metropolitan areas is traffic congestion, which is one of the most important issues to be resolved in promoting the block system. With rapid economic and social development, urban construction in China gradually stepped into the process of modernization planning, but the overall concept adopted the thinking pattern of “big and complete” in the initial stages of China. To achieve the goals of developing roads in a grid or chess-board way, improving road construction and making it sustainable, authorities should plan and open new channels rationally, improve road network density, and make urban traffic networks more densely embedded in the whole city operation rather than widen the existing roads blindly. Opening enclosed housing estate is the best way to help alleviate traffic congestion by converting the roads in gated residential communities to public transport roads, thus reducing traffic on the presently overcrowded main roads.

Third, the block system can promote economic development and offer a good living experience for residents. In general, a block is composed of streets, residential areas, and squares. In short, the block system is a combination of residential and commercial space that fulfils the residents' need for living, business, and entertainment. The block system will open the residential area to form an open society without walls. The block system uses open blocks to break the gated communities, changing the traditional mode of separation of commerce and residence to

a combined unit, gradually decentralizing the business district and expanding its customer base. Residents of the neighborhood can plan and experience business activities and leisure within walking distance, thus strengthening the close connections between residents and the surrounding environment. A compact layout and a variety of space for residents will provide a good living experience, and an important boost to the construction of a vibrant neighborhood with the cultural characteristics of sustainable development.

### **Disadvantages of the Block System**

First, the block system, to a certain extent, can bring risks to the security of the residents. Closed residential developments are commendable for having relatively independent control methods. Their own entrances and exits and security systems give the residents a higher sense of security, the advantages of which are not available in a block system. Open communities have higher requirements for security, which is more difficult to manage. Once criminals enter a community, they have a greater chance of escaping if the security personnel or the police cannot respond quickly and apprehend them in a short time. For examples we can look at Chicago, Los Angeles and other cities in the United States where the practice of block systems is common. Local universities such as the University of Chicago, and University of Southern California have no “walls.” This results in security risks in an obvious way. In many places, the demand for police presence is very high while in other places, the requirement for citizen awareness is very high. For example, on the campus of the University of Chicago, located in a less developed southern part of the city, almost every street has a guard station equipped with security personnel, but there are few guard stations within Northwestern University, also located in Chicago. According to the locals, Northwestern University is located in a wealthy area with more socially aware residents. But whether in university or residential neighborhood, a large number of vehicles flooding into the community will restrict the leisure environment of the residents. Therefore, once the block system is adopted, the corresponding traffic regulations and other supporting provisions will be crucial, because traffic directly relates to the safety and security of residents in the neighborhood.

Second, the block system can reduce the environment's comfort to a certain extent. An open community means that the privately-owned areas become public areas. Noise, exhaust and light pollution will become troubling factors. Opening the entrances to the community can bring the street vendors and cause damage to the facilities which originally may have had good maintenance. Environmental and health conditions may become regressive. Therefore, open blocks can bring greater challenges to urban management authority. Additionally, the existing property system will become an obstacle. At present, property management in China is based on a community's private area which belongs to all the community residents. When the open blocks become a reality and the private area becomes a public area, property management authority will be questioned and the owner's management right will be limited.

Third, the central issue is the property disputes arising from the implementation of block reform.

The interests of all parties must be considered. Simply “demolishing the wall” to promote block reform will greatly reduce the ownership benefits and rights attached to the property, which will also reduce the personal rights and interests of the residents. The current social situation does not allow blindly developing the block system in China. Without a good system and relevant laws to protect property rights, the “one-size-fits-all” implementation of the block system will lead to many social problems, including conflicts between individuals, between individuals and governments. If we cannot make clear divisions and descriptions of property rights in the public areas of communities, and if we cannot provide reasonable and fair compensation for the losses community citizens will suffer, the block system reform will face great resistance.

### **Legal Basis to Distinguish the Newly Built Residential Quarters from Those that Have Been Completed and Lay a Good Foundation for the Rationality of Block System Reform**

#### **The Reform of the Block System for Newly Built Residential Quarters and Those that Have Been Completed Should be Implemented in Different Directions**

With respect to block system reform, this paper holds that we should thoroughly understand the original, basic intentions of the Opinions, clearly distinguish the old and newly built residential quarters, and utilize different methods for implementing reform respectively.

First, the Opinions, put forward, “New residences should promote the block system in principle, and closed residential areas should not be constructed any longer.”<sup>①</sup> Thus, the object of this reform is new residential areas rather than the residential areas which have been completed. Even for new residences, it should start with pilot projects. The reform of pilot areas selected for the initial reforms of the block system should be implemented through the planning and construction design of the unbuilt cells before the construction of the residential areas. The construction costs of public roads in the new block should not be allocated to residential property owners. Also, residential property owners will no longer pay for the private areas. The government should coordinate the construction costs in the planning. Therefore, with the block system reform implemented, roads and green spaces in the newly built residence areas will be attributed to “urban public roads” and “urban public green spaces” according to the *Civil Code of the People’s Republic of China*.

Second, the Opinions stated, “Residential quarters and compounds that have been completed should be gradually opened to make the internal roads available to the public, to solve the problem of the layout of the road network, and to facilitate land conservation.”<sup>②</sup> “Gradually” reflects such a progressive attitude that not all of the completed residential quarters and compounds should be

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<sup>①②</sup> Article 16 of Part VI of the *Several Opinions of the Central Committee and the State Council of the CPC on Further Strengthening the Management of Urban Planning and Construction*.

affected by the block system. The city construction planning of new areas is not retroactive to the old residences on a legal level. If the already built residential quarters and compounds have to be opened, then it must be based on the needs of the public interest.

### **The Focus of the Block System Reform for Completed Residences: Expropriating the Internal Roads that Are Co-owned by the Residents**

#### **The focus of the block system reform: Greater difficulty in the completed residence.**

From the above analysis, although there are problems in the implementation of the block system reforms, plans, explicit ideas, strategy adjustments and co-ordinate arrangements, sharing the costs of reform in advance can help decrease the resistance. The focus of the problem is the block system reform for the completed residences seems to be in conflict with the laws and regulations of China. For the completed residences, the reform is bound to include part of the original internal roads and green spaces, causing conflicts between the rights of owners to use the internal roads and green spaces and the rights of outsiders to use the public roads. Making the internal roads public is a change to the rights originally belonging to the owners of the internal roads and green spaces.

As is stated in the “Real Rights” of the *Civil Code*, “The roads within the zoning lot shall be co-owned by owners, except those belonging in the public roads of a city or town. The green spaces within the zoning lot shall be co-owned by owners, except those belonging in the public green spaces of a city or town or, as it is clearly indicated, belonging to individuals.”<sup>①</sup> In addition, as is prescribed in the *Interpretation of the Supreme People’s Court on Several Issues Concerning the Specific Application of Law in the Trial of Disputes over Partitioned Ownership of Building Areas*, “Owners shall share the right to use the land used for building with regard to the land within the building areas.”<sup>②</sup>

According to China’s real estate development model, real estate developers get the right to use the land originally belonging to the country (for seventy years) by purchasing the land transfer payments. Property price also includes corresponding land transfer payments. The internal roads and green spaces are calculated as private areas in the purchase. In addition, the construction, use and maintenance costs of the roads and green spaces are shared by all owners. Therefore, it can be considered that all owners of the residence enjoy exclusive and dominant rights to roads and plantings. If it is necessary to dispose of the roads and plantings, or to change their functions, it shall be carried out under the premise of legality. One is expected to follow the established *Civil Code* and relevant judicial interpretations and cope with the relationships between opening the closed areas and abiding by the *Civil Code* and other laws and regulations. If the country is determined to promote block system reform, assorted special laws must be established as soon as possible to regulate and guarantee a fair process to effectively avoid contradictions and conflicts.

① Article 274 of the *Civil Code of the People’s Republic of China*.

② Article 3 of the *Interpretation of the Supreme People’s Court on Several Questions Concerning the Specific Application of Law in the Trial of Disputes over Differentiated Ownership of Buildings*.



### **The focus of the block system reform for the completed residences: Expropriation acts and their restrictions.**

The country's disposing of the real property originally belonging to the citizens shall be deemed to be expropriate acts. According to the provisions of the *Constitution of the People's Republic of China*,<sup>①</sup> "The state may, for the public interest, expropriate or take over land for public use, and pay compensation in accordance with the law." Besides, Article 243 of the *Civil Code* states: "Land owned by collectives and buildings and other immovables of organizations or individuals may be expropriated in the interest of the public within the limits of power and under the procedures provided for by laws." With regard to the implementation of the reform of the block system for the completed residence, expropriation is of great use. Expropriation aiming at meeting the needs of the public interest, via restricting private property ownership, is a product of socialization of ownership.

To a certain extent, the expropriation system makes some deviation from national protection of the citizens' lawful private property system. However, because the fundamental point of the expropriation system is to safeguard public interests, and the constitutions of many countries include many stringent restrictions to expropriation, this system becomes much more legitimate and valid. According to the common views, it is necessary to meet the following three requirements for expropriate acts:

First, public interests. Due to the needs for public interests, the country can implement the expropriation acts, as well as in the block system reform for the completed residence. Public interest sets the limits for the expropriation system. Some countries use terms like "public use," "public welfare" and "public need," but no matter what kind of translation or interpretation is applied, it is always clearly stated that it cannot be used beyond the value of public interest. With regard to whether to make a clear definition of public interest, Chinese scholar Chen Xiaomin believes that "the public interest cannot be defined, for its content and object of benefits are uncertain" (Chen, 2001, p. 182). Therefore, it is very important to explain or interpret the "public interest" from the point of law. The interpretation of "public interest" cannot be expanded. "Public interest" contains only two categories: national interest and social public interest. Moreover, the bearing subjects of public interest could merely be the state or unspecific individuals, rather than certain social organizations, institutions, enterprises, or individuals.

Second, due process. Since it is hard to define the public interests, it should be supplemented by the clear and orderly rigid characteristics of procedures, in order to enhance the feasibility and stability in the practical application. *Land Administration Law of the People's Republic of China* and its enforcement regulations have set stringent procedural limitations to land acquisition. China's approval authorities for land acquisition are concentrated in the State Council and the provincial people's governments, and their respective authorities of examination and approval are clear. It is necessary to go through the process of land acquisition announcement—survey and confirmation of land

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① Article 10 and Article 13 of the *Constitution of the People's Republic of China*.

② Article 243 of the *Civil Code of the People's Republic of China*.

acquisition—letter of land acquisition—notification of land acquisition hearings—preparation for land acquisition hearings and other pre-process. Although the spirit of due process has been established in the legal level, in practice, the lack of rights for participating parties, qualified representation for the owners of expropriated lands and the shortage of proper supervision, among other issues are still severe problems. Therefore, continuous refinement and improvement of the law is of the utmost importance.

Third, reasonable compensation. From the perspective of effectiveness, because of the fact that land acquisition always goes along with compensation, a relatively high cost of expropriation is the most powerful guarantee for limiting the abuse of public power. Once the barrier is broken or prescribed as “can be compensated” rather than “should be compensated” in the law, land expropriation may be violated, and private property rights could suffer a large threat from public power.

In view of the reform of the block system for the residential quarters that have been completed, China should adopt the principle of appropriate compensation. It is necessary to establish a clear calculation model for the amount of compensation while the increasing amounts of compensation and the continuous expansion of the scope of compensation contribute to fully protecting the legitimate rights and interests of owners.

In the process of the implementation of the block system reforms, the acquisition acts towards people's property due to the public interest must be in line with the objectives of public interest, due process, and reasonable compensation. Only when the acts of acquisition are in conformity with the provisions of the Constitution and the law can civil rights be protected and a win-win solution for both public interests and personal civil rights be achieved.

## **Probing the Paths—Proposals for Gradually Promoting Reform of the Block System**

### **Legislation First: The Basic Prerequisite for the Steady Progress of Block System Reform**

In the long run, the promotion of the block system is conducive to the maximum protection of the public interests. Therefore, it is suggested that the country should regulate urban planning through a certain series of acts. The relationship between policy and law should be addressed first, especially when some policies make it very difficult to avoid damaging individual rights. The implementation of such a policy must follow the principle of legislation, otherwise the authority of the law will be challenged and the requirements of the “rule of law” and “build a government under the rule of law” would be reversed.

With reference to legislation, we cannot merely learn from the practices of the United Kingdom and other Western countries to establish special laws concerning the block system reform. We must also amend the related terms and articles in the existing *Civil Code*, and urban and rural planning laws

which conflict with policy implementation. No matter what kind of methods will be adopted, the core issue of legislation is still to maximize the protection of citizens' private property and individual rights. Legal protection is mainly composed of two aspects: entity guarantee and procedural guarantee.

#### **The entity guarantee.**

The most important thing in the entity guarantee is to solve the problem of developing a non-normative compensation system and the payment of construction costs incurred in the process of road reconstruction. The land compensation for the expropriation of the roads within the completed residential quarters should be calculated by the benchmark of the real estate market price at that time, in accordance with the corresponding private area shared by the owners. Beyond question, the same compensation system should be used for expropriated green spaces and parking spaces. Compensation principles should be based on reasonability and fairness, and it must be forbidden to make citizens' loss too great simply because of market price fluctuations. Expropriation of the internal roads will definitely require road reconstruction costs, maintenance management fees and other expenses which shall be paid by the government.

In order to protect the personal safety of citizens, it should be made clear through legal provisions that the roads will have reasonable speed limits as well. The UK, for example, requires cars to travel at speeds not exceeding 20 miles per hour in residential areas, and the residential roads in Chicago have a speed limit of 25 miles per hour. In addition, noise interference will affect the living experience of residents, so it is required to establish legislation regarding the decibel limits and providing effective relief. In 1997, New York City passed the *Noise Control Code* stating that within a one-meter distance from residential buildings all noise sources of more than 45 dB are prohibited, and that sounds and whistles shall not last for more than 3 minutes if violating it for more than 3 times, the violator will be fined between \$525 to \$2,625 as penalty. All of the specific legal provisions are worthy of our reference. The environmental protection authority should set up a special noise processing agency, whose duty is to receive complaints from the public, review and investigate them in a timely manner, and apply impartial treatment.

#### **The procedural guarantee.**

The key point in the procedural guarantee is to establish a sound public participation and decision-making mechanism. The UK's *Town and Country Planning Act 1990*, established in 1968 stressed that the most important aspect of the decisive procedure for the structural planning was about public participation, and "the common methods of public participation in urban planning adopted by the UK include consulting documents, liaison groups, public meetings, design consultations, and other means" (Sun, 2009). China can introduce ideas from the UK and establish a multi-level, multi-variety public participation mechanism. For the residential quarters that have been completed, whether to make the roads within the residence public should be jointly resolved by all the owners. According to Wang Liming, the owners share equal rights to possess and use the common property and the rights to dispose of the common property must be exercised under the prerequisite of consent of all

the owners, otherwise the disposing behavior would be invalid. However, in actual practice, it is often very difficult for all the owners to agree on the disposing behavior, which means that if one votes against it, then the block system reform of the whole residential quarters would be in trouble, and the reform process of the entire area would be affected. As a consequence, under the premise of reasonable and fair compensation, only if a majority (more than 2/3) of the common owners have reached an agreement, the internal roads being made public could be implemented.

### **Improvement of the Supporting System and Facilities: The Material Guarantee for the Steady Progress of Block System Reform**

The reform of the block system is a long-term and complicated task. While solving the severe problems of compensation, decision-making and other issues, we should adopt a gradual, measured approach rather than merely push forward in a rapid way. It is advised to regard unit compounds, government agencies and large communities as pilot areas in the first place, try to absorb and accumulate experience and then gradually apply what has been learned to the whole of society. Taking the compound for an example, under the planned economy system, planning and construction structure are the main reasons for unit compound produced by the unit of free allocation of land in most idle land. Meanwhile, the number of interior courtyard residents is getting smaller with the development of market economy gradually out of the compound, resulting in that the land waste problem is becoming increasingly prominent. In addition, it is a pilot reform for the unit compound residents and commercial housing residents to obtain housing ownership and pay for the price the first time to be far from the compound, which also has a positive role model for the whole society.

For the internal roads being made public, this should be gradual and progressive. It is believed that, as a first step, pedestrians and non-motorized vehicles should be taken as a model. Due to the current problem on domestic traffic congestion, the phenomenon of mutual interference between motor vehicles and non-motor vehicles, non-motor vehicle drivers are obviously being exposed to safety and security risks. If closed residential roads can separate non-motor vehicle and pedestrian lanes from motorized vehicles, it will reduce traffic pressures by moving this traffic away from the main roads and increase vehicle speed. At the same time, pedestrians and non-motorized vehicles will not affect the safety of residents in the original area and will not cause the original residents to block reform.

Currently, the wisdom of community governance is a basic understanding. In order to safeguard the safety of the residents in the neighborhood, it is imperative to set up a comprehensive monitoring system and an advanced access control system. With the development of science, technology and networking, the traditional security systems relying on a wall and manpower is no longer the main trend. On the contrary, the boundaries between intelligent security technology and computer technology are clearly disappearing. Intelligent security systems include three parts: access control, alarms, and monitoring. A mature intelligent security system should be equipped with anti-theft

alarms, video monitoring, entrance control alarms, security personnel patrol alarms, GPS vehicle alarms and a 110 alarm network transmission system. The system's coverage area, coupled with additional systems as needed, can be reliable supports upon which we build open and safe areas. Of course, intelligent security advantages through software with the ability to strengthen the close ties between the property security personnel and the local police jurisdiction to improve the jurisdiction's speed and reaction mechanisms needs to be constantly explored in practice and innovation, in order to truly carry forward the block reform resistance.

### **Cultural Construction: Effective Help for the Steady Progress of Block System Reform**

At present, some citizens mistakenly regard the block system reform as the wall movement and consider the conversion of the internal roads from private to public as a conversion to a "market." These misunderstandings then lead to the resistance against the block system reform. Block system reform is not simply about "remove the wall" and "open the gate area," and blocking reform is not like blocking a great scourge. But it is still necessary to strengthen cultural construction in the process of reform, in order to let the citizens understand the superiority of the block system and the necessity of the reform.

Chinese urban residents, who have experienced from "courtyard" to "closed residential communities," understand that "closed" is always associated with them. In the era of the planned economy, the closure of a compound was a symbol of rights and status; in the era of the market economy, the closure of high-grade residential areas is the proof of economic status. Therefore, in the traditional sense, closed residential communities bring more security and may represent a high-quality living environment. On the contrary, the block system is considered by some residents as a synonym for confusion and noise, which is caused by the closure of information and the lack of publicity. The implementation of any policy requires a full range of policy support. Therefore, first, the government should let the residents know the closed area is causing problems to the city, and that opening the area on behalf of civilization and an open, new city concept is the foundation for making the city a better place for everyone. This can make the whole society gradually accept and participate in the block system reform. Second, the government should carry out extensive publicity and promotion in the area of successful pilot block reforms, which can not only eliminate the misunderstanding of the residents of the block system, but also accumulate valuable experiences from the reforms.

### **Conclusion**

As a solution to control urban disease, the block system reform cannot eliminate all the contradictions in the process of urban development, but the living experience and other positive aspects that come from easing traffic pressure for residents still have a positive impact on city life. The Supreme People's Court provided this positive evaluation of the block system reform: "This opinion belongs to the policies of the Party and the state level, to protect the interests of owners, including

the main body involved. There is a process through legislation to achieve the rule of law.”<sup>①</sup> It is true that in the process of promoting the reform of the block system will encounter many obstacles and problems, but it is always a basic standpoint standing to solve these problems out of protecting civil rights. Only by taking into account the protection of civil rights, taking into account the interests of all, and fully listening to the demands of citizens can the reform steadily proceed and the ultimate goal of safeguarding public interests achieve.

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(Editor: Zeng Yueying)

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<sup>①</sup> The Supreme People's Court responded to "community opening" : Legislation is still needed to realize the rule of law. Retrieved from <https://finance.huanqiu.com/article/9CaKrnJU3Oi>



# *Research on the Cultivation of the Innovative Subcenters in Sichuan Based on the Chengdu-Chongqing Economic Circle Strategic Background*

Zhang Jing and Li Jing\*

Science and Technology for Development Research Center of Sichuan Province

**Abstract:** This paper summarizes the development experience of the subcenters in leading provinces, including their establishment mode, strategic positioning, development mode and economic development. It also analyzes the economic development characteristics, regional patterns, and location distributions of Mianyang, Deyang, Leshan, Yibin, Luzhou, Nanchong and Dazhou, the seven alternative subcenters in Sichuan province. It focuses on the analysis of their basic situations regarding scientific and technological (S&T) innovation development including investment in S&T innovation, talent team construction, S&T achievements, industrial structure and S&T platforms compared with the innovative subcenters in leading provinces. Results show that the scale of S&T innovation activities in the seven alternative subcenters in Sichuan province needs to be improved. Finally, based on the Chengdu-Chongqing economic circle strategy, this paper puts forward the thoughts and suggestions on how to cultivate the innovative subcenters in Sichuan province.

**Keywords:** subcenters, S&T innovation, Chengdu-Chongqing economic circle, innovative subcenters

**DOI:** <http://dx.doi.org/10.19873/j.cnki.2096-0212.2021.02.009>

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\* Zhang Jing, Science and Technology for Development Research Center of Sichuan Province;  
Li Jing, Science and Technology for Development Research Center of Sichuan Province.

Correspondence concerning this article should address to Li Jing, Science and Technology for Development Research Center of Sichuan Province, Chengdu. E-mail: 974854592@qq.com

**A**t the beginning of 2020, the Chengdu-Chongqing economic circle strategy became a national strategy to promote China's major regional development. In July, the Seventh Plenary Session of the 11th CPC Sichuan Provincial Committee examined and approved the "Decision of the CPC Sichuan Provincial Committee on Further Implementing the Guiding Principles from General Secretary Xi Jinping's Major Speeches and Accelerating the Development of Chengdu-Chongqing Economic Circle." They put forward a view to strengthen the secondary support of the Chengdu-Chongqing economic circle and to support the regional central cities to become sub-economic centers within Sichuan province and the Chengdu-Chongqing region. The cultivation of the subcenters in Sichuan province has become an important deployment in support of the national strategy to build the subcenter in the Chengdu-Chongqing economic zone.

## **The Origin and Connotations of Subcenters**

### **Theoretical Origin**

The concept of provincial centers was first proposed by Qin Zunwen, a researcher of Hubei Academy of Social Sciences, who carried out the strategic layout of "one main city and two secondary cities" according to the characteristics of the unbalanced economic development of the east and the west in Hubei province (Qin, 2011). Later, it developed as the provincial subcenters theory. At present, China has 50 provincial subcenters distributed throughout Guangdong province, Jiangsu province, Zhejiang province and 26 other provinces (or cities).

### **Strategic Connotation**

The strategic connotation of provincial subcenters' cultivation is to redirect Chinese economic development mode transitions. The original intention to cultivate provincial subcenters is to optimize the layout of regional economic development and promote surrounding areas. However, as China's economy is now in a transitional period from "rapid growth" to "high-quality development," development must also shift to an innovation-driven mode. In addition, China has entered the advanced stage of industrialization, and S&T innovation's contribution to economic growth is rapidly increasing. Therefore, for provincial subcenter cities, it should strengthen scientific and technological innovation to promote high-quality development.

### **The Practice of Subcenters in Leading Provinces**

Provincial subcenters are usually more than 150 kilometers away from the provincial capital city. They have stronger comprehensive strength than the surrounding areas, larger radiation-driven capability for perimeters, and unique superior resources. Generally, they are

usually “prefecture-level cities” according to the administrative levels.

### **Approaches to the Establishment of Subcenters**

There are three main approaches to the establishment of subcenters. First, the cities specifically designated in the state plan become subcenter, such as Dalian in Liaoning province, Qingdao in Shandong province, Ningbo in Zhejiang province, Xiamen in Fujian province and Shenzhen in Guangdong province. Second, the cities with unique advantages become subcenters, such as Luoyang in Henan province, Sanya in Hainan province, Guilin in Guangxi province, Quanzhou in Fujian province, Zunyi in Guizhou province, Yantai in Shandong province, and Suzhou and Wuxi in Jiangsu province. Third, the CPC provincial committees and governments directly set up subcenters, such as Xiangyang and Yichang in Hubei province, Ganzhou, Jiujiang and Shangrao in Jiangxi province, Wuhu in Anhui province, Datong, Changzhi, Jincheng and Yuncheng in Shanxi province, Yueyang, Hengyang and Changde in Hunan province, and Zhuhai, Shantou and Zhanjiang in Guangdong province.

### **Strategic Positioning of Subcenters**

Subcenters are mainly set up for three purposes.

First, subcenters can be the multi-point and multi-pole in local regions to drive local economic development. Provincial subcenters stimulate the development of surrounding areas, and their primary function is to optimize the regional layout by changing the provincial landscape from “one center” to “multiple centers”. For example, Shenzhen in Guangdong province, Ningbo in Zhejiang province, Suzhou and Wuxi in Jiangsu province, Qingdao in Shandong province, Yantai and Dalian in Liaoning province, have formed a “dual-core” or “three-core” development landscape with central cities in their respective provinces, jointly promoting provincial prosperity.

Second, subcenters can contribute to reducing the overload burden of central cities. The central cities usually gather manifold functions concerning provincial government, economy, culture and communications, which cause overcrowding and excessive expansion. The subcenters can take some functions of the central cities’ and effectively alleviate the “big city disease.” For example, Xiangyang, a subcenter in Hubei province, as a regional center adjacent to Hubei-Henan-Chongqing-Shaanxi, shares part of the transportation hub functions with Wuhan, the central city. Similarly, Hengyang shares the southern Hunan area’s political, economic, military, cultural-center and transportation hub functions.

Third, subcenters can remedy the functional deficiencies of the central cities. Due to regional and historical conditions, some central cities have restrictions on certain functions, so subcenters can be a better choice to cover the shortages. Shenzhen, the subcenter in Guangdong province, is the financial center and S&T innovation center. Suzhou, the

subcenter in Jiangsu province, is the economic center. Dalian, the subcenter in Liaoning province, is a shipping and foreign trade center. Xiamen, the subcenter in Fujian province, is the center of tourism, foreign trade, and shipping. These functions supplement and support the strengths of their central cities.

### Innovation-driven Development of Subcenters

As China's economy has shifted from rapid growth to high-quality development, many subcenters have embarked on the road of innovation-driven development. Since 2008, Ministry of Science and Technology of the People's Republic of China and the National Development and Reform Commission have implemented innovative city pilot projects to encourage qualified cities to try the innovation-driven mode. These cities usually have good innovation foundations, outstanding advantages and characteristics, and obvious regional radiation effects as well. Now 78 cities are developing as national pilot cities for innovative development, including 18 provincial subcenters, which account for nearly 40 percent of the total number of subcenters. All the subcenters that are developing in Jiangsu province, Fujian province, Shandong province, Liaoning province and other 10 provinces are innovative cities. These cities are identified as innovative subcenters in this paper.

Table 1 (Innovative) Subcenters

Area	Province	Subcenter			
East China	Guangdong	Shenzhen *	Zhuhai	Shantou	Zhanjiang
	Jiangsu	Suzhou *	Wuxi *		
	Zhejiang	Ningbo *	Wenzhou		
	Fujian	Xiamen *	Quanzhou *		
	Hebei	Tangshan *	Baoding		
	Shandong	Qingdao *	Yantai *		
	Beijing	Tongzhou			
	Liaoning	Dalian *			
	Hainan	Sanya			
Central China	Heilongjiang	Qiqihar	Jiamusi	Mudanjiang	Daqing
	Shanxi	Datong	Changzhi	Linfen	
	Inner Mongolia	Ordos	Chifeng	Tongliao	
	Hunan	Yueyang	Changde	Hengyang *	
	Guangxi	Liuzhou	Beihai		
	Hubei	Yichang *	Xiangyang*		
	Anhui	Wuhu *			
	Jilin	Jilin *			

Area	Province	Subcenter			
Central China	Jiangxi	Ganzhou *	Jiujiang	Shangrao	
	Henan	Luoyang *			
West China	Yunnan	Dali	Qujing		
	Tibet	Xigaze	Chamdo		
	Gansu	Tianshui	Jiuquan		
	Qinghai	Geermu			
	Guizhou	Zhunyi *			
	Chongqing	Wanzhou			
	Shaanxi	Baoji *			

Note: \* represents an innovative subcenter city

## The Economic Development of Innovative Subcenters

The innovative subcenters have significant advantages. There is a correlation and interaction between S&T innovation and economic performance. Both as innovative cities and subcenters, the innovative subcenters' economic performance is much better than that of the non-innovative subcenters (see Table 2). Generally, the average GDP of innovative subcenters was RMB656.46 billion higher than that of non-innovative subcenters, with a ratio of 4.5 times. After excluding the cities specifically designated in the state plan, the ratio was 3.8 times and the gap was still obvious. In different regions, economic disparities between innovative cities and non-innovative cities were the biggest in eastern China, with the average GDP ratio 3.5 for the two kinds of cities. The ratio was 3.0 in central China and 2.6 in western China in which the difference was relatively flat. For non-innovative subcenters, their local economic growth was mainly due to fixed asset investments, local resources and traditional industries.

Table 2 Average GDP of (Non-) Innovative Subcenters

Mode	City Quantity	All cities/RMB Billion	#Excluding the Cities Specifically Designated in the State Plan	#Eastern China	#Central China	#Western China
Innovative Subcenters	18	842.61	709.55	1065.84	561.4	263.26
Non-Innovative Subcenters	28	186.15	186.15	301.8	185.86	99.93
Difference		656.46	523.4	764.04	375.54	163.33
The Ratio		4.5	3.8	3.5	3	2.6

Source: Local government bulletin in 2018

Generally, the economic development level of central cities is relatively higher than that of subcenters. Based on the data of 18 innovative subcenters in 2018, the central cities'

average proportion of GDP in their province was 24.5 percent, while the subcenters was 15.5 percent. In eastern China, the subcenters' contribution to provincial economies was no less than that of the central cities. Six subcenters, namely, Tangshan in Hebei province, Suzhou in Jiangsu province, Quanzhou in Fujian province, Qingdao in Shandong province, Shenzhen in Guangdong province, and Dalian in Liaoning province, made greater contributions to the local economy than provincial central cities did. Furthermore, the average proportion of provincial GDP in the provinces of Suzhou, Qingdao and Dalian were at least 5 percent higher than that of their central cities. In central and western China, the economic performance of subcenters was obviously inferior to that of central cities. The subcenters generally had a low contribution to the regional economy. Except for Zunyi in Guizhou province, the GDP of other cities accounted for lower than 11 percent of the province. In addition, the pattern of "one dominant city" led to a big gap in local GDP contributions to the provinces between subcenters and central cities. The largest gap was between Jilin city, the subcenter, and Changchun, the central city in Jilin province where the GDP contribution of Jilin city to the province was 37.6 percent points lower than Changchun. Meanwhile the gap between Yichang and Xiangyang in Hubei province, Baoji in Shaanxi province and Hengyang in Hunan province and their central cities were all higher than 21 percentage points.

Table 3 Economic Development of Innovative Subcenters

Area	Province	Subcenter	GDP in 2018/ RMB Billion	Proportion in Province/%	Central City	GDP in 2018/ RMB Billion	Proportion in Province/%
Eastern China	Hebei	Tangshan	695.5	19.3	Shijiazhuang	608.3	16.9
	Jiangsu	Wuxi	1143.9	12.4	Nanjing	1282	13.8
		Suzhou	1859.8	20.1			
	Zhejiang	Ningbo	1074.6	19.1	Hangzhou	1350.9	24.0
	Fujian	Xiamen	479.1	13.4	Fuzhou	785.7	21.9
		Quanzhou	846.8	23.7			
	Shandong	Qingdao	1200.2	15.7	Jinan	785.7	10.3
		Yantai	783.3	10.2			
	Guangdong	Shenzhen	2422.2	24.9	Guangzhou	2285.9	23.5
Central China	Liaoning	Dalian	766.9	30.3	Shenyang	629.2	24.9
	Mean	Subcenter	1127.2	18.9	Center	2243.6	19.3
	Jilin	Jilin	150.7	10.0	Changchun	717.6	47.6
	Anhui	Wuhu	325	10.8	Hefei	782.3	26.1
	Henan	Luoyang	474	9.9	Zhengzhou	1014.3	21.1
	Hubei	Yichang	406.4	10.3	Wuhan	1484.7	37.7
		Xiangyang	431	10.9			
Hunan	Hengyang	Hengyang	304.6	8.4	Changsha	1100.3	30.2



Area	Province	Subcenter	GDP in 2018/ RMB Billion	Proportion in Province/%	Central City	GDP in 2018/ RMB Billion	Proportion in Province/%
Central China	Average	Subcenter	348.6	10.1	Center	1019.8	32.5
Western China	Guizhou	Zunyi	300	20.3	Guiyang	379.8	25.7
	Shaanxi	Baoji	226.5	9.3	Xi 'An	835	34.2
	Average	Subcenter	263.3	14.8	Center	607.4	30.0
Total	Average	Subcenter	771.7	15.5	Center	1572.8	25.6

Source: Local government bulletin in 2018

## Development of Seven Alternative Subcenter Cities in Sichuan Province

In 2018, the Third Plenary Session of the 11th CPC Sichuan Provincial Committee proposed to develop Mianyang, Deyang, Leshan, Yibin, Luzhou, Nanchong and Dazhou as regional central cities to cultivate provincial subcenters in Sichuan province. Among these cities, Deyang, Yibin and Luzhou are the first batch of provincial innovative cities under construction. In 2020, the Chengdu-Chongqing economic circle became a national strategy and the Seventh Plenary Session of the 11th CPC Sichuan Provincial Committee plans to take regional central cities' cultivation and expansion as a strategic project to realize the Chengdu-Chongqing central area development and the south wing crossing and north wing revitalization. The Chengdu-Chongqing central area development will be driven by Mianyang, Deyang and Leshan, cities that can accelerate the integrative development of the Chengdu Plain economic zone. The key to the south wing crossing is that Yibin and Luzhou can strengthen the coordinated development of Sichuan and Chongqing along the Yangtze River and vigorously promote the integration of inner cities and southern Sichuan. The main point of the north wing revitalization is that Nanchong and Dazhou need to actively undertake the industrial transfer of Chengdu and Chongqing to accelerate the development of the northeast Sichuan economic zone. The seven alternative cities, Mianyang, Deyang, Leshan, Yibin, Luzhou, Nanchong and Dazhou will be given more important strategic development missions.

## Characteristics of Economic Development

Economic development and S&T innovation in Sichuan province present a regional pattern of "one dominant city". Chengdu is not only the economic and innovation center of Sichuan province, but also the core of the Chengdu-Chongqing economic circle. In 2019, Chengdu's GDP reached RMB1.7 trillion, accounting for 36.5 percent of the provincial total and 24.2 percent of the Sichuan-Chongqing region. Mianyang, Deyang, Yibin, Nanchong, Luzhou, Dazhou and Leshan, the seven cities, which are striving to become subcenters, have ranked 2nd to 8th by GDP in the province for four consecutive years. But each

regional GDP accounted for less than 6 percent of Sichuan province, and their economic aggregate accounted for only 33.3 percent of the province, which was still less than Chengdu. Meanwhile, the seven cities' investments in innovation showed an obvious echelon distribution.

Table 4 Economic Development

Area	Province	Subcenter	GDP in 2018/ Billion Yuan	Proportion in Province/%	Central City	GDP In 2018/ Billion Yuan	Proportion in Province/%
Eastern China		Average	1127.2	18.9	Average	2243.6	19.3
Central China		Average	348.6	10.1	Average	1019.8	32.5
Western China	Guizhou	Zunyi	300.0	20.3	Guiyang	379.8	25.7
	Shaanxi	Baoji	226.5	9.3	Xi'an	835.0	34.2
	Alternative Subcenters in Sichuan Province	Mianyang	230.4	5.7	Chengdu	1534.3	37.7
		Deyang	221.4	5.4			
		Yibin	202.6	5.0			
		Nanchong	200.6	4.9			
		Luzhou	169.5	4.2			
		Dazhou	169.0	4.2			
		Leshan	161.5	4.0			
		Average	209.1	7.0	Average	916.4	32.5

Source: Local government bulletin in 2018

There is a big economic gap between the seven cities in Sichuan province and the innovative subcenters in other leading provinces. GDP in each of Sichuan's seven alternative subcenters was less than 1/3 of the average GDP of innovative subcenters in the leading province, and also less than that in the western region. The GDP of Mianyang, the city with the highest GDP among the alternative subcenters, was only 20 percent of the average GDP of innovative subcenters in the eastern region. The contribution of Sichuan's seven cities to the provincial economic development was small. The GDP proportion of each of the seven cities was less than six percent, which was far from the average of innovative subcenters in the leading provinces (15.5 percent).

### Regional Pattern and Location Distribution

In developed eastern provinces, the central cities and subcenters are equally important for development, while Chengdu, the central city, is the only dominant city in Sichuan province. Chengdu undertakes too many functions and plays an irreplaceable role in economic growth and innovation of Sichuan province. This pattern is similar to Zhengzhou in Henan province, Changsha in Hunan province and Wuhan in Hubei province. Because various economic and S&T innovation elements are highly concentrated in Chengdu, it intensifies the unbalance of regional development in the province. However, most developed provinces present a "dual-core" or "tri-core" regional pattern. Central and subcenters are economically active,

with strong and expanding development momentum in Hangzhou and Ningbo in Zhejiang province, Nanjing, Suzhou and Wuxi in Jiangsu province, and Jinan, Qingdao and Yantai in Shandong province.

The distance between provincial subcenters and central cities needs to be moderate. In leading provinces, the average distance between innovative subcenters and central cities is 230 kilometers. It is 266 kilometers in the eastern region, 196 kilometers in the central region and 158 kilometers in the western region. In Sichuan province, Chengdu, Deyang and Mianyang have formed a trend of cohesive development. Mianyang, Deyang and Leshan are the central cities of the integrated development of the Chengdu Plain economic zone and they are located near Chengdu, about 74 to 135 kilometers away. Yibin and Luzhou are important cities in the urban agglomeration of southern Sichuan economic zone. They are also the central cities in the Chengdu-Chongqing economic circle that comprise “the south wing” span and the main node cities of the Chengdu-Chongqing principal axis. They are both more than 250 kilometers away from Chengdu, and have relatively good economic and innovative development. Nanchong and Dazhou are the “two cores” of the urban agglomeration in northeastern Sichuan and are the central cities that lead revitalization of “the north wing” in the Chengdu-Chongqing economic circle. They are more than 230 kilometers and 400 kilometers respectively away from Chengdu. From the perspective of this regional layout, cultivating subcenters in southern Sichuan economic zone and northeastern Sichuan economic zone are likely to form a triangular pole with Chengdu, which will promote the provincial development and stimulate the development of the surrounding areas.

## **The Science and Technology Innovation Development Foundations of Sichuan Alternative Subcenters**

### **R&D Investment**

In 2018, Chengdu invested RMB39.23 billion in R&D activities, accounting for 53.2 percent of the provincial total. Mianyang invested RMB15.24 billion, accounting for 20.7 percent of the provincial total. Deyang and Yibin invested RMB5.73 billion and RMB2.44 billion respectively, their aggregate accounting for 11.1 percent of the provincial total. The R&D investments of the remaining four cities were less than RMB2 billion, accounting for 6.0 percent of the provincial total. Mianyang and Deyang benefited from the S&T support given by the national central government to research institutions in Sichuan, so the R&D intensity reached 6.61 percent and 2.59 percent, both higher than Chengdu. Mianyang’s R&D intensity was even the highest among all the innovative cities, and Deyang’s R&D intensity surpassed 80 percent of innovative cities nationally. The R&D intensity of Yibin was 1.21 percent, only better than 20 percent of innovative cities nationwide. However, R&D intensity in Nanchong,

Luzhou, Dazhou and Leshan was all less than 1 percent.

Table 5 R&D Investment

Area	Province	Subcenter	R&D Investment/ Billion Yuan	Proportion in Province/%	R&D Intensity/%	Central City	R&D Investment/ Billion Yuan	Proportion in Province/%	R&D Intensity/%
Eastern China	Hebei	Tangshan	7.8	15.6	1.20	Shijiazhuang	12.3	24.5	2.20
	Jiangsu	Wuxi	31.8	12.7	2.80	Nanjing	36.3	14.5	3.10
		Suzhou	39.3	15.7	2.30				
	Zhejiang	Ningbo	24.2	16.7	2.50	Hangzhou	39.7	27.4	3.20
	Fujian	Xiamen	14.2	22.2	3.30	Fuzhou	15.5	24.1	2.20
		Quanzhou	8.1	12.7	1.10				
	Shandong	Qingdao	30.7	18.7	2.80	Jinan	18.5	11.3	2.60
		Yantai	19.0	11.5	2.60				
	Guangdong	Shenzhen	97.7	36.1	4.30	Guangzhou	53.2	19.7	2.50
Central China	Liaoning	Dalian	16.4	35.7	2.40	Shenyang	14.0	30.5	2.40
	Average	Subcenter	28.9	19.8	2.50	Center	26.0	20.1	2.60
	Jilin	Jilin	2.4	20.4	1.10	Changchun	9.4	81.6	1.40
	Anhui	Wuhu	8.8	13.6	3.00	Hefei	22.7	35.0	3.20
	Henan	Luoyang	8.6	12.9	2.00	Zhengzhou	15.9	23.7	1.70
	Hubei	Yichang	5.4	6.6	1.40	Wuhan	42.9	52.2	3.20
		Xiangyang	7.6	9.3	1.90				
	Hunan	Hengyang	3.0	4.6	1.00	Changsha	24.8	37.7	2.40
	Average	Subcenter	6.0	11.2	1.70	Center	26.4	47.0	2.50
Western China	Guizhou	Zunyi	1.1	9.2	0.40	Guiyang	4.8	39.1	1.30
	Shaanxi	Baoji	2.9	5.4	1.30	Xi'an	36.0	67.6	4.80
	Alternative Subcenters in Sichuan Province	Mianyang	15.2	20.7	6.61	Chengdu	39.2	53.2	2.56
		Deyang	5.7	7.8	2.59				
		Yibin	2.4	3.3	1.21				
		Nanchong	1.0	1.4	0.52				
		Luzhou	1.2	1.7	0.73				
		Dazhou	0.7	0.9	0.40				
		Leshan	1.5	2.0	0.93				
		Average	3.5	5.8	1.63	Center	26.7	53.3	2.89

Source: Local government bulletins in 2018, *Evaluation Report on Innovation Ability of National Innovative Cities 2019* and *Sichuan Science and Technology Statistical Yearbook 2019*

Seven alternative subcenters have their own advantages. In terms of R&D intensity, Mianyang had a prominent advantage. Deyang (2.59 percent) was very close to the average value of innovative subcenters in the eastern provinces (2.50 percent), while the remaining five cities had low R&D investment intensity with little competitiveness. However, each of the seven cities in Sichuan province laid out less R&D investment than the average amount of innovative subcenters in the eastern provinces (RMB28.93 billion).

### Innovation of Science and Technology Personnel Teams

R&D personnel is the main component of the S&T innovation personnel teams. Among the alternative cities in Sichuan province, Mianyang invested in 28,480 full-time R&D personnel in 2018, ranking first among the seven alternative cities. Deyang invested in 10,394 full-time R&D personnel, and the remaining 5 cities invested in less than 10,000 full-time personnel, which was far lower than the average of 14,197 full-time people in the central and 63,270 full-time people in eastern innovative subcenters, and greatly different from the 88,810 full-time R&D personnel in Chengdu, the central city of Sichuan province.

The proportion of R&D personnel in every 10,000 employed personnel reflects the intensity of the R&D personnel input. Among the alternative subcenters in Sichuan province, Mianyang had the highest intensity of R&D personnel input (95 persons/year), followed by Yibin (85 persons/year). The average intensity of R&D personnel input in the seven cities was 47 persons/year, 5 persons/year higher than that of the innovative subcenters in the central region and 34 persons/year lower than that of the eastern region. Among them, the intensity of R&D personnel input in Deyang and Yibin exceeded that of some innovative subcenters in the eastern region, which indicates they have a certain competitiveness in S&T innovation.

Table 6 Science and Technology Personnel

Area	Province	Subcenter	R&D Personnel/Person-Year	R&D Personnel per 10,000 Employees
Eastern China		Mean	63,270	91
Central China		Mean	14,197	42
Western China	Guizhou	Zunyi	4,924	11
	Shaanxi	Baoji	6,581	37
	Alternative Subcenters in Sichuan Province	Luzhou	3,144	28
		Deyang	10,394	46
		Mianyang	28,480	95
		Leshan	2,238	16
		Nanchong	2,802	23
		Yibin	5,245	85

Area	Province	Subcenter	R&D Personnel/Person-Year	R&D Personnel per 10,000 Employees
Western China	Alternative Subcenters In Sichuan Province	Dazhou	1,763	39
		Average	7,286	42

### Scientific and Technological Innovation Outputs

The ownership of invention patents is a typical index used to measure the output of S&T innovation. Among the candidate cities of Sichuan province, Mianyang had 5,406 valid invention patents. Deyang had 2,682. Yibin had 2,131. The rest of the cities had less than 1,000. Innovation-oriented subcenters in the eastern region had an average of 25,623 valid invention patents, nearly five times that of Mianyang. The number of invention patents owned by 10,000 people reflects the output efficiency of innovation achievements. The number of invention patents owned by 10,000 people in Mianyang was 11.1, and that in Deyang was 7.6. The number of invention patents owned by 10,000 people in other regions was less than 5, while the average number of innovative subcenters in the eastern and central regions was 27.3 and 8.3 respectively.

The technical contract turnover reflects the active degree of the transformation of scientific and technological achievements. Among the alternative subcenters in Sichuan province, the technical contract turnover in Mianyang reached RMB1.22 billion, Luzhou RMB940 million, and Deyang RMB700 million. The remaining areas were less than RMB300 million, which means the transformation of S&T achievements was insufficient. The average technical contract turnover of innovative subcenter cities in the eastern region and central region were RMB11.86 billion and RMB5.02 billion respectively, far more than those in Sichuan province. The proportion of technology contract turnover in GDP reflects the degree of support S&T provides to the local economy. The percentages in Luzhou and Mianyang were 0.55 percent and 0.53 percent, respectively, and 0.32 percent in Deyang. The remaining areas were less than 0.20 percent, while the average technical contract turnover of innovative subcenters in the eastern and central regions were 0.93 percent and 1.35 percent, respectively, whose supporting effects of S&T innovation on the economy was significantly higher than that of the seven cities in Sichuan province.

Table 7 Scientific and Technological Innovation Output

Area	Province	Subcenter	Ownership of Invention Patents /Piece	Total Number of Invention Patents Owned by 10,000 People	Technical Contract Transaction Amount /Million (RMB)	Proportion of Technical Contract Turnover in GDP/%
Eastern China		Average	25,623	27.3	11,860	0.93
Central China		Average	3,860	8.3	5,020	1.35



Area	Province	Subcenter	Ownership of Invention Patents /Piece	Total Number of Invention Patents Owned by 10,000 People	Technical Contract Transaction Amount /Million (RMB)	Proportion of Technical Contract Turnover in GDP/%
Western China	Guizhou	Zunyi	1,191	1.9	690	0.25
	Shaanxi	Baoji	992	2.6	2,510	1.14
	Alternative Subcenters in Sichuan Province	Luzhou	909	2.1	940	0.55
		Deyang	2,682	7.6	700	0.32
		Mianyang	5,406	11.1	1,220	0.53
		Leshan	753	2.3	160	0.1
		Nanchong	344	0.5	280	0.14
		Yibin	2,131	4.7	110	0.05
		Dazhou	279	0.5	50	0.03
		Average	1,632	3.7	740	0.35

Source: Local government bulletin in 2018

## Development of High-tech Industries

The scale of high-tech industries in the seven cities is small but is making a positive contribution to the economy. High-tech industry represents the development of local R&D activity intensity in industry. Among the alternative cities of Sichuan province, there were only 263 high-tech enterprises in Mianyang, 203 in Deyang, 111 in Yibin and less than 100 in the other areas, which was lower than the average number of 2,385 and 303 of innovative subcenters in the eastern and central regions respectively. The proportion of the main income of high-tech enterprises is an important index to measure the industrial structure of S&T innovation. The proportion in Mianyang was 50 percent, the highest in the province, followed by Leshan, Dazhou and Deyang, which were 23.5 percent, 21.8 percent and 20.9 percent respectively. The remaining were no more than 15 percent. The average proportion of innovative subcenters in the eastern region and the central region were 30.1 percent and 28.5 percent respectively, which shows that Mianyang had an absolute advantage.

Table 8 High-tech Industries

Area	Province	Subcenter	High-tech Enterprises/Unit	High-tech Enterprises' Income/ Billion Yuan	Income Proportion of High-tech Industry in Whole Industry/%
Eastern China		Average	2,385	543.4	30.1
Central China		Average	303	115.6	28.5
Western China	Guizhou	Zunyi	117	22.9	10.4
	Shaanxi	Baoji	122	95.4	36.0

Area	Province	Subcenter	High-tech Enterprises/Unit	High-tech Enterprises' Income/ Billion Yuan	Income Proportion of High-tech Industry in Whole Industry/%
Western China	Subcenters in Sichuan Province	Luzhou	95	18.0	10.1
		Deyang	203	73.5	20.9
		Mianyang	263	135.3	50.0
		Leshan	84	34.4	23.5
		Nanchong	84	26.9	10.2
		Yibin	111	35.0	13.1
		Dazhou	57	27.5	21.8
		Average	126	52.1	21.8

Source: Local government bulletin in 2018

### National Science and Technology Platforms

National science and technology platforms are high-quality platforms for S&T innovation, including key state laboratories, engineering technology research centers, S&T business incubators, national university S&T parks, national record space for mass innovation, national demonstration bases for mass entrepreneurship and innovation, and national bases for international S&T cooperation. Among the candidate subcenters in Sichuan province, Mianyang has 20 national science and technology platforms, Luzhou has seven, and the remaining areas have less than five. What is more, there are only two key state laboratories and one engineering technology research center in Mianyang, one key state laboratory in Deyang and one national engineering technology research center in Luzhou. The average number of national platforms in innovative subcenters in the eastern and central regions is 65.5 and 9.7 respectively. The scale of national S&T platforms for the seven alternative subcenters is small.

Table 9 National S&T Platforms

Area	Province	Subcenter	National Platform/Unit	#Key Laboratories/ Unit	#Engineering Technology Research Centers/Unit
Eastern China		Average	65.5	2.6	3.5
Central China		Average	9.7	0.8	0.7
Western China	Guizhou	Zunyi	4	0	0
	Shaanxi	Baoji	8	0	2
	Subcenters in Sichuan Province	Luzhou	7	0	1
		Deyang	4	1	0
		Mianyang	20	2	1

Area	Province	Subcenter	National Platform/Unit	#Key Laboratories/Unit	#Engineering Technology Research Centers/Unit
Western China	Subcenters in Sichuan Province	Leshan	1	0	0
		Nanchong	0	0	0
		Yibin	2	0	0
		Dazhou	1	0	0
		Average	5.2	0.3	0.4

Source: Local government bulletin in 2018

## Thoughts and Suggestions on Cultivation of Innovative Subcenters in Sichuan Province

### Deeply Integrate Provincial Sub-Center Cultivation with the Layout of the Sub-Pole in the Chengdu-Chongqing Economic Circle

Based on the strategic layout of “one main city and two secondary cities” in the Chengdu-Chongqing economic circle, regarding the development strategy of “one stem and many branches” as the most important support, development should focus on cultivating and integrating the provincial subcenters in Sichuan with the formation of a sub-pole in the Chengdu-Chongqing region in order to promote innovative interactions and factor aggregation capacities in Sichuan and Chongqing. Cultivation and expansion of the subcenters needs to be regarded as an important regional strategic project to support the construction of the Chengdu-Chongqing economic circle. In this way, it will be beneficial to the rise of the central Chengdu-Chongqing region, the qualitative leap of “the south wing” and the revitalization of “the north wing” in the Chengdu-Chongqing economic circle.

### Clearly Determine Functional Positioning of Subcenters Within the Chengdu-Chongqing Economic Circle

To enhance the comprehensive ability of the region, including its economy, innovative ability and population carrying capacity, the priority functional positioning of the subcenters needs to share these functions to reduce the degree of centralization of Chengdu. In Chengdu Plain economic zone, Mianyang should be built into China’s S&T city with international influence and to be a national scientific research and production base; Deyang should be developed as a world-class major equipment manufacturing base; Leshan should become “China’s green Silicon Valley” in the photovoltaic industry chain. In southern Sichuan economic zone, Yibin should be mainly cultivated as a national innovative modern industry development demonstration zone and a national demonstration city for industry and

education integration; Luzhou should be cultivated as a shipping and trade center in the upper reaches of the Yangtze River and a regional medical and health center which will bring about a qualitative leap for “the south wing”. In northeastern Sichuan economic zone, Nanchong should be built into a central city in the north of the Chengdu-Chongqing area and a demonstration city of the Jialing River green ecological economic zone; Dazhou should be built into a comprehensive transportation hub in the east and the north to accelerate the revitalization of “the north wing.”

### **Strengthen the Innovation Capacity of Innovative Subcenters**

Based on Chengdu S&T City and Mianyang S&T City, the government should actively promote the construction of the Chengdu-Chongqing S&T Innovation Center and strive to establish the first “comprehensive national science center” in western China. Joint efforts should be made to implement the first trial of the national S&T innovation policy in the Chengdu-Chongqing region and endeavor to establish more national major S&T infrastructures, frontier science centers, national laboratories and other national research bases and platforms, and to widely attract S&T resources and talents to Sichuan. The government should improve the carrying capacity of the original innovation, basic research and cutting-edge interdisciplinary fields, the joint research capability of major science and applied technologies, and the pooling capacity of high-end innovation resources. The government should build a multi-tiered system of regional innovation and make regional innovation interconnected in terms of innovation growth poles, growth points and growth belts, actively explore ways to build an innovative system with “province-city-county” linkage development, and accelerate the construction of innovative provinces and innovative cities in Sichuan province.

### **Provide Sufficient Policy Support to Subcenters**

A subcenters cultivation coordinating group should be set up by drawing lessons from the development-coordinating group for the Yangtze River economic belt, the coordinating group for the Belt and Road Initiative construction, and the coordinating group of the Beijing-Tianjin-Hebei association for development. A provincial subcenters cultivation coordinating group should be established to make top-level designs and supervise the development and growth of the subcenters to support the national strategy. The government should grant greater financial and economic and social management rights to subcenters, coordinate benefits between provincial and municipal governments and draw lessons from the subcenters which are specifically designated in the state plan, and the subcenters in Jiangsu province and Zhejiang province. The government should reserve part of the tax revenue for subcenters to develop, grant subcenters certain territorial tax management authority, and delegate provincial-level planning and economic management powers, such as the power of land index

planning and tax type adjustments, to subcenters so that they can develop flexibly according to local conditions. Resource allocations should be prioritized to the subcenters. Major production and innovation factors, such as the layout of industrial parks, the construction of large enterprises, and the establishment of colleges and institutional branches, should also be prioritized to subcenters to improve their comprehensive strength and distribute the highly concentrated functions of the central cities.

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(Editor: Xu Huilan)

# *Research on the Realization Mechanism of and Approach to Ecological Product Valuations*

Li Mingxing

Chengdu Institution of New Economic Development

Zhang Kejun\*

Sichuan Academy of Social Sciences

**Abstract:** Ecological product is an innovative practice for ecological valuations in China. Due to the influence of historical conditions and development stages in China, research on the realization of ecological valuations has lagged. In the new era, the construction of an ecological civilization guided by the “Two Mountains” theory has been promoted to the national strategic level and is supporting the growth of theoretical research and practical exploration based on the understanding of ecological product values. We want to innovate and improve the system used to realize the value of ecological products by applying the existing research, which focuses on the concept definition of ecological products and their correlation theories. Through systematic expansion and upgrades in this system, the evaluation accuracy of ecological products can be improved, providing valuable references for further practical exploration and promoting an ecological culture in China.

**Keywords:** value of ecological products, implementation mechanism, ecological civilization construction, value reference

**DOI:** <http://dx.doi.org/10.19873/j.cnki.2096-0212.2021.02.010>

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\* Li Mingxing, Chengdu Institution of New Economic Development;  
Zhang Kejun, Sichuan Academy of Social Sciences.

Correspondence concerning this article should be addressed to Li Mingxing, Chengdu Institution of New Economic Development Chengdu, Sichuan. Email: 1146730862@qq.com.



## Introduction

Over time, the interactions between the ecological environment and the development of human societies have become increasingly complex and the international community is paying more attention to the ecological environment and ecological products than ever before. As the development of China has entered a new era, the global situation and domestic reality force us to choose the path of green and sustainable development, which requires us to comply with the development concept of “Lucid waters and lush mountains are invaluable assets” and accelerate the construction of an ecological civilization. As President Xi Jinping pointed out that the ecological civilization system of China has been initially established and contains the main framework of “multiple pillars.” However, there are still three parts of the implementation of the system that need to be improved. These are property rights, market-oriented mechanisms, and management systems. Innovations and improvements in these mechanisms are critical to the successful construction of an ecological civilization.

## The Definition of Ecological Products

Due to the lack of intuitive expression, a strict definition of the concept of ecological products has not been generally accepted although there has been a great deal of conceptual guidance. According to relevant theories, the concept of ecological products is based on the concept of ecosystem service value (Jiang & Ji, 2006). Relevant research conducted in the 1950s and 1960s includes the introduction of Holdren and Ehrlich’s concept of ecosystem service (Ehrlich, 1974), which was the core of related research overseas. At the beginning of the 21st century, the international cooperation project of the International Millennium Ecosystem Assessment (MA) systematically divided the earth’s ecosystem services into such contents as supplying materials, regulating natural elements, providing spiritual and recreational services, and maintaining the earth’s living conditions, which formed the basis of ecosystem service.

The earlier research, which can be studied in China, started with the research and design of the vegetation system in the Loess Plateau (Hong & Yang, 1985). Later, Ren Yaowu et al. (1992) studied and defined the concept and connotation of ecological products and proposed that ecological products refer to safe, reliable, pollution-free and high-grade products produced by the ecological industry (agriculture) without ecological stagnation. Ren believed that ecological products had five characteristics: Naturalness, limitation, pertinence, localization and timeliness. On this basis, the academic community continued research on low-consumption, low-pollution industrial and agricultural products (Cai, 1996), and tended to define ecological products as specific material products that met certain environmental protection or ecological standards. Research also included studies on the theories and methods of product design around this concept (Li & Gao, 1998; Yang, 1999; Wang & Hu, 2000). Thus, the concepts of pollution-free products

and green products were derived. After entering the 21st century, the concept of ecological products has been further defined by the domestic theoretical circles, which have expanded the boundaries from material products to service supplies and expanded the connotations of ecological protections and the realization of social public economic values. In 2010, the State Council of the People's Republic of China issued a national plan for developing functional zones which pointed out that human beings have the demand for fresh air, clean water sources, a pleasant climate and other ecological products, and that ecological products, together with agricultural products, industrial products and service products, are necessary and consumable products for human life. Since then, the concept of ecological products has been summarized as, "Maintaining ecological security, ensuring ecological regulation functions, providing a good living environment including fresh air, clean water sources, growing forests, a suitable climate and other natural products not directly related to human labor, and organic food, green agricultural products, ecological industrial products and other material products produced through cleaner production, recycling, and consumption and emissions reduction to reduce the consumption of ecological resources" (Wang, Wang & Wang, 2002; Zeng, Yu & Xie, 2014).

On the basis of this concept, we hold that the traditional definition of ecological products as natural elements and material products is not adequate to meet the needs of the diversified development of modern society, especially with the continuous refinement of social service systems and the rapid development of interdisciplinary studies, and that ecological products in the modern sense should include the carrier of material products derivative-related services, such as technology transformation and application guidance. This definition can cover the traditional ecological products to the greatest extent, and better fit the system divisions of industrial types and industry categories in modern society (Fig. 1).

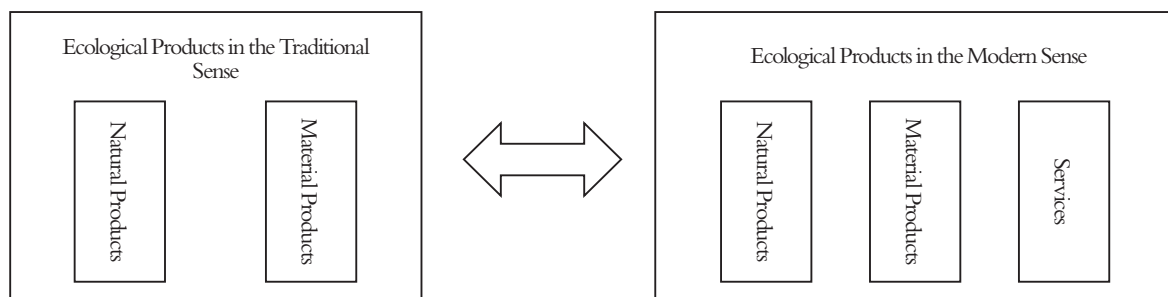


Figure 1 Classification of Ecological Products

## The Theoretical Basis for the Value Realization of Ecological Products

Robyn Loomes, Kelli O'Neill, and others have done systematic research on different

types of ecosystem service functions and their value evaluation by applying the principles of economics (Ma, 2012; Loomes & O'Neill, 1997), which played an important role in guiding the academic community in building a theoretical system with ecosystem service value as the core. Among these systems, the most representative are the brief history of total economic value by Krutilla (1967), the division of tangible and material ecological environment economic value by Fisher (Kelso & Maurice, 1976), and the Total Enterprise Value (TEV) of ecosystem services classification framework proposed by Boland and Freeman (1981). In addition, there are also relevant theoretical and practical studies conducted by Matthew A. Wilson and others, who carried out value assessments of freshwater and forest ecosystems (Wilson & Carpenter, 1999). And during the 1980s, the UK, the US, France, and other countries put forward ecological environment protections and restorations (Qiu & Jin, 2019). In the early 1990s, Dutch public institutions and the United Nations first formally put forward the theory of multi-disciplinary integration, directed at "ecological design" which included the economy, environment, management and ecology, and then established the international organization for standardization and ISO14000, a new standard for environmental management systems.

There has also been an upsurge in research on the evaluation methodology of ecosystem service values, including conditional value methods (Davis, 1963), income cost reduction methods (Cuperas, 1986), and market mechanism evaluation methods (Guo & Li, 1998). Based on this, the authors gradually explored ways and mechanisms such as finance, taxation, and finance to promote the market-oriented transformation of ecosystem service values, such as the "Ecological Bank" (Zhao & Li, 2020) and "Carbon Exchange Trading." During this period, research in related fields was also started. Typical examples are: The analysis of the value connotation of ecological products from the perspective of public and non-public welfare (Wu & Du, 2014); value realization mechanisms from the perspective of economics, such as ecological purchase and ecological compensation (Li Yuansheng, 2018; Li & Qing, 2005); ecological agricultural development (Wen & Ting, 2019); ecological poverty alleviation and development (Mao & Xu, 2017; Xiao & Jiang, 2019); and ecological environmental protection (Luo, 2019). The systematic theories and methods of ecological valuation (He & Xu, 2019) include the shadow price method, alternative engineering method, the profit and loss analysis method, and the value equivalent method, among others (Huang, 2015; Ouyang, Wang & Miao, 1999; Peng, Wang, Chen, Li & Jiang, 2005; Yue, Jian, Hui, et al., 2017; Xie, Zhang, Zhang, et al., 2015).

Generally, although there are similarities and differences in the understanding of the value realization of ecological products, due to the differences in the definition of ecological products at home and abroad, the theoretical basis is still largely similar, which mainly includes several aspects. The first is the value theory. According to the Marxist stand, viewpoint and method of labor theory of value, the value of a commodity can be objectively measured by the average number of labor hours required to produce that commodity. Therefore, the value basis of ecological products is the use-value, and the core of this value is human labor. However, to realize

the unity of use-value and value, it is necessary to define the human labor in ecological products and quantify and sum them in the form of price. The second is the utility theory. According to the micro theories of Western economics, product utility is the core basis of product payment cost, or the price. With the increase of supply, marginal utility presents a decreasing law, and its payment cost naturally decreases. This basic principle should be followed to complete the connections between supply and demand for ecological products. The third is the public goods theory. The new political economy divides products into public goods (including quasi-public goods) and private goods with the characteristics of “competition” and “exclusiveness.” In fact, ecological products have these two kinds of goods attributes, which determine that the socialized distribution of products must consider both public interests and private interests. The fourth is the property rights theory. The core idea of Coase’s property rights theory is that a clear property right relationship can greatly reduce transaction costs. Therefore, if the ecological products can be transformed into private products or quasi-private products through the definition of property rights, and then be supplied through market mechanisms, it undoubtedly provides an effective way for us to solve the external problems in the process of ecological construction.

### **The Mechanism System for Value Realization of Ecological Products**

Through the application of the above theories, we can form the value realization mechanisms for ecological products, establish values for ecological commercialization, realize the convergence of supply and demand issues, and thus reach agreements on transaction prices. This will solve a series of problems, such as the value formation of ecological products, the connections between supply and demand, market transactions, income distribution and risk management.

#### **How Is the Value of Ecological Products Formed?**

Ecological resources have natural attributes and are the materials and conditions which are formed naturally and shared by human beings. Ecological products are formed by labor transformations of ecological resources, although the labor transformations may be purposeful and can be directly reflected or be unintentionally attached and indirectly reflected. Therefore, not matter which form or type the ecological products belong to must be based on the premise of human labor, including the transaction of materialized labor (the ecological capital, represented by the word “C”), the variable capital investment (the labor capital, input in the process of producing ecological products, represented by the word “V”), and the surplus value (the excess of ecological products compared with the total production of ecological capital and human capital, represented by the word “m”). However, this value formation mechanism of ecological products is from the perspective of general products only. For ecological products with strong externality, such as fresh air, water, and land, the above elements are obviously not enough. The boundlessness of natural resources and the unintentionalness of labor transformations lead to complex and pluralistic

characteristics in the value of ecological products, including multi-level use, complex sources, diversity of composition, quantitative dynamics and spatial differences (Li, Bo & Cui, 2020). Relevant scholars have conducted a more in-depth studies on this issue. Among them, the most referential one is the binary price system of ecological products proposed by Zhang Ying and others (Zhang, Cheng, Wang, Lu & He, 2016). These studies point out that the different economic behaviors of buying and selling ecological products correspond to two opposite development modes of ecological environment protection and development, and that there are positive and negative externalities in these two market behaviors. Therefore, from the perspective of a more complete value system, ecological products should be based on the labor transformations of ecological elements and combined with different labor attributes to fully consider the external influences on their existence (Fig. 2).

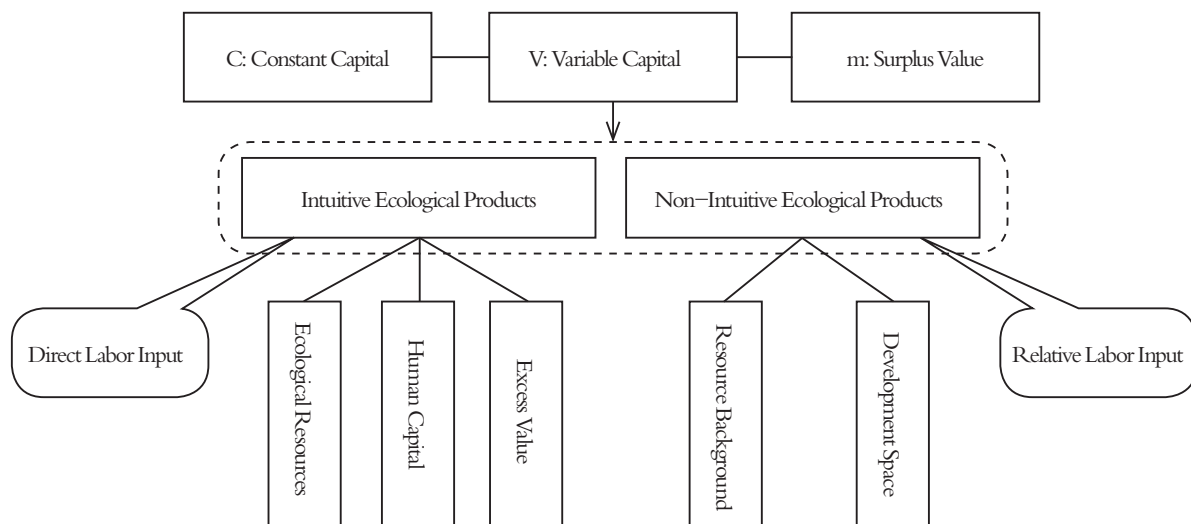


Figure 2 Value composition of ecological products

Ecological products are formed through labor transformations, for which their purpose can be directly reflected and referred to as intuitive ecological products. Examples are landscape design, water source protection, environmental restoration, and green agricultural products. Value formation for these is relatively simple. Like ordinary commercial products, they are mainly quantified by the positive reflection of human labor. Ecological products formed by labor transformations that are not directly attached or reflected can be referred to as non-intuitive ecological products, for example, air and water resources with relative quality differences which are caused by industrial environments, the space or environments created by the needs of urban development, and other differential resources and environmental conditions which are caused by the differences in human economic activities. The value formation for these is more complex and is not reflected by the simple positive results of human labor, but

the relative value formed by the differential input of human labor. Human labor input with high quality will reduce the negative impact on ecology, and then produce a higher relative value for ecological products. However, it may also produce a lower relative value for the ecological products. Therefore, consideration of the value for non-intuitive ecological products should be based on two aspects. The first is the background of the resource, for example, the natural attribute basis of the ecological products such as the size of the spatial range, the balance of the water and soil ratio, and the amount of nutrient content. The second is the development space. This is the resources that can be achieved through the corresponding implementable technical means within a certain period of time, the degree of utility development, the degree of pollution that can be tolerated, the activity intensity that can be carried, and the consumption satisfaction that can be achieved.

### **The Supply and Demand Mechanism of the Ecological Products**

The connection between supply and demand for the ecological products, the transactions of value and their form of transformation can determine the value of ecological products. According to utility theory, to realize the connection between supply and demand, what is essential is the balance between the marginal utility of ecological products and the transaction costs between supply and demand as subjects reach the Pareto Optimal state. Analysis reveals three meanings.

#### **Reasonably defined property rights.**

The basic condition of the establishment of the relationship between supply and demand of ecological products is the clear division of product ownership and power. From the perspective of the value formation mechanisms of ecological products, the value of intuitive ecological products or non-intuitive ecological products can be derived from public labor and private labor. Therefore, the definition of property rights of ecological products should also include public and private attributes, and we should carry out confirmation of rights at different levels comprehensively and systematically, and establish a corresponding legal protection system for property rights.

#### **To scientifically determine property rights.**

As discussed above, there are many forms of expression for ecological products, including natural products, material products, and service products, all of which are different from normal products. But this does not mean there are differences in the property rights between ecological products and normal products just because of the differences in the forms of expression. Thus, we should promote innovations for the value realization of ecological products with full consideration of different demands of stakeholders, actively improve the positive rights and rights of the owners, including the owner's exercise of possession, use, disposal and income, and the owner's negative right to exclude other people's interference, to realize the return, exclusion, and prevention of interference claims.



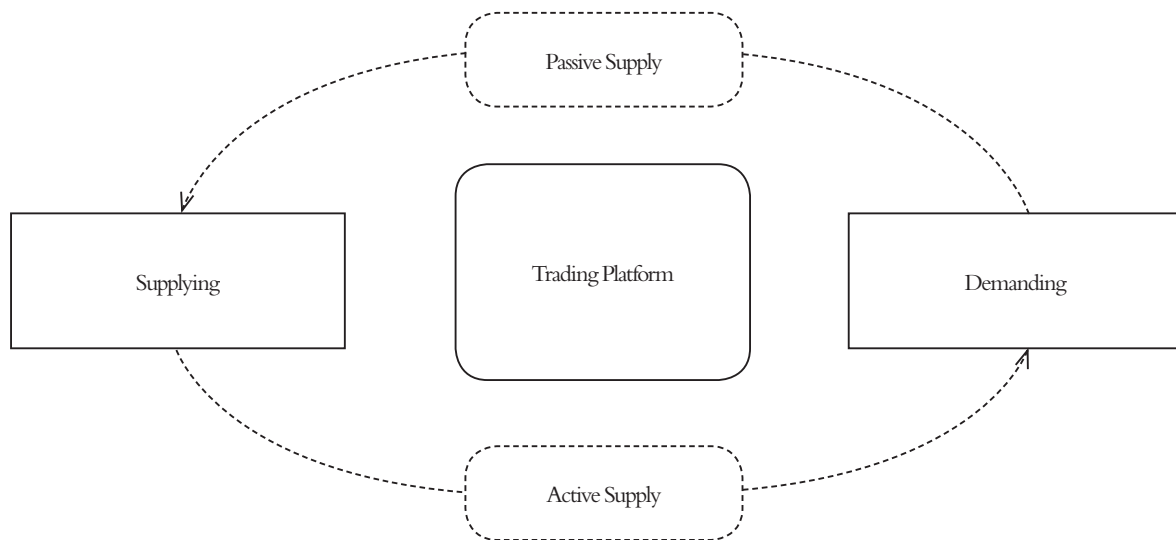


Figure 3 The Supply and Demand Patterns of Ecological Products

The patterns of supply and demand for ecological products are naturally different and are based on the differences in the attributes of ecological products. Generally, the modes can be divided into two categories. One is passive while the other is active. The “Passive Supply” category refers to the pattern formed when the supply of ecological products is driven by the specific needs of the demand side and the purpose of the supply is to meet the private need of the demand. Examples are organic vegetables, energy-saving and environmental protection-oriented electronic products, and services helping to control air pollution. Under the conditions of passive supply, the demand side maintains the state by accepting the terms of the suppliers, especially the price. The “Active Supply” category refers to the pattern formed when the supply of ecological products is based on consideration for the public welfare. While the demand side does not clearly express demand intentions such as upgraded urban parks, national ecological protection of forests, and improved water treatment facilities, the demand side is guided by the state through its responsibility for the welfare of the people, especially considering their obligation of paying taxes.

### The Essential Factor of Ecological Products Trading

In order to realize transactions of ecological products, it is necessary, according to the basic law of market transactions, to have a system, which is based on prices, platforms, procedures, and a few other elements. (Fig. 4)

First, we should build a price system for ecological products based on the law of value. We have analyzed the value formation mechanisms and the calculation of the values of ecological products based on value formation, which is usually called the value evaluation, and the result of value evaluations is the price system of ecological products. Overall, the mature ecological value

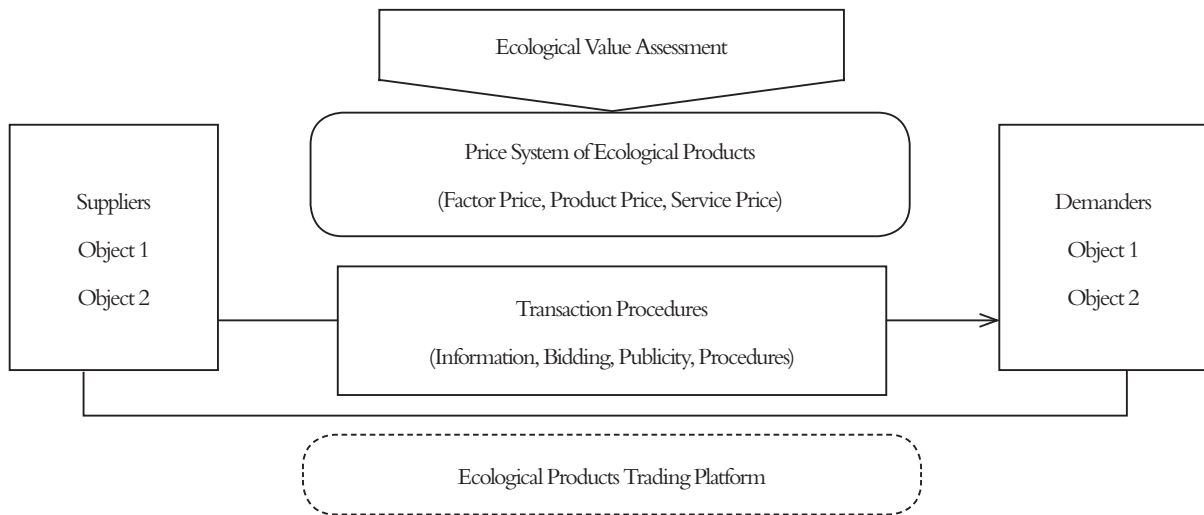


Figure 4 Ecological Products Trading Platform System

evaluation methods currently used can be roughly divided into three categories (Liu, Y., Du, X., & Zou, M., et al., 2017). The first is the direct market method. This mainly includes the cost expenditure method, the market value method, the opportunity cost method, the recovery and protection cost method, the shadow engineering method, the human capital method, and others. The second is the alternative market method. This mainly includes the travel expense and hedonic value method. The third is the simulated market method. This mainly includes the conditional value method. Generally, the direct market method is more suitable for intuitive ecological products, while the alternative market method and the simulated market method are more suitable for non-intuitive ecological products. Of course, in specific operation processes, there may be ecological products with the characteristics of both types of products, so it is necessary to use a variety of compatible evaluation methods.

Second, we should build an efficient and convenient trading platform for ecological products. In terms of function, it is the space-time carrier for the trading of ecological products. From the perspective of practice, the ecological bank, which emerged earlier in foreign countries, is the most typical. For example, the water bank, the wetland mitigation bank, and the forest bank have been gradually introduced to China. However, there are still many weak spots in the construction of ecological products trading platforms. Especially, their service systems have yet to be perfected and need continuous innovation. For example, it is necessary to increase capital investments, to gradually optimize the platforms to raise social capita, and then to gradually change the construction situation now dominated by government investment. We should continue to enrich the platforms, not only in regard to the existing modes, such as the ecological bank, but also to strengthen the two-way innovations and extensions of the platform service chains. In addition, we should focus on the application of advanced technologies and

concepts, especially the in-depth integration of digital technology, the Internet, artificial intelligence, and block chains, to meet the diversified needs of the market.

Third, we should design standardized and orderly ecological products trading procedures. Considering the strong externality of many ecological products, the trading procedures for ecological products should strictly follow the closed-loop trading rules, that is, the ecological products should be traded on a particular platform with normal standards. Taking market-oriented transaction of land resources as an example, the transaction procedures can be roughly divided into four parts, which are the product information release, fair bidding, political result announcements, and procedure fulfillment. Among these, the information release is the basis of transaction docking between the supply and demand sides. Fair bidding is the core link in the transaction procedure, of course, and according to the different properties of the ecological products, we can choose collective bargaining or agreement pricing. The announcement is a kind of open system for the conclusion of the transaction, which aims to ensure that the transaction of the products conforms to the basic rules of the market and accurately conveys information to relevant parties. Procedure fulfillment mainly refers to perfecting the transaction restrictions and identifications after the transaction between the supply and demand sides is concluded, which can be conducted by the government or third-party entities based on the procedural specifications, such as the environmental protection record, the price record and the ownership change registration.

### **The Income Distribution of Ecological Products**

The income distribution of general product transactions mainly includes three parts, namely, compensation for the resource consumption of the products, profits for the capital investments in the production of the products and the obligation to pay for the public expenses. As to the primary market, the primary transaction of the product property rights, the income distribution mainly includes compensation for resources consumed by the product, and the obligation to pay for the public expenses. Regarding the secondary market, the secondary transaction of the product property rights, the income distribution mainly includes the profit for the capital investments in the production, and the obligation to pay for the public expenses. For ecological products, the resources consumed come from public property or private property, and the capital investments in the production of ecological products can come from public capital or private capital. Therefore, the income distribution of ecological products is relatively complex. In general, there are several matters that should be made clear.

The first matter concerns who the beneficiary is. On the whole, the realization of the ecological product involves the work of the property rights subjects (mainly refers to the ownership of the products), the investment subjects and the management. According to the basic principle of the income distribution, which is guided by the property rights system: First, the subjects of the property rights are the primary subjects who have the right and the

qualifications to enjoy the income. According to the basic principle that the one who owns the product resource will get the benefits that comes from it, and under the current ownership system current Chinese ownership system, we should clearly define two types of beneficiary objects, the collective organizations and the citizens, and clarify the benefit rules among the members within the subject; second, the investment subjects are the main bodies who have the qualifications to enjoy the income. Generally, the amount of the investment is used to measure the benefit from the income, which contains the monetary capital investment, the labor capital investment, the technology investment, etc., which are generally in the form of share quantifications; third, the management service subjects are also important subjects of the income enjoyment, which is mainly based on their reasonable service in the process of product value realization, and of course, there is another purpose, which is to keep a balance for the public welfare. The public benefits can be explored in the form of taxes, fees, funds, etc.

The second matter concerns how to develop a reasonable income standard. In essence, there are two meanings regarding the income division. One is how to allocate the overall income rationally, and the other is how to limit the amount of the partial income. Generally, we usually realize that the profit of the investors is achieved through the products transaction, and that therefore, the division of income is mainly applicable to the limit of the profit margin. But for the income standard division of the property rights subjects and the management, there need to be more necessary considerations. On the one hand, we should consider the basic rights and interests of the subjects of the property rights, and on the other hand, we should consider the external benefits. Therefore, the standard is generally dynamic. In principle, the division of income standards does not consider the overlapping relationships among the beneficiaries. For example, when the state invests in the construction of regional ecological projects, the government, as the executor of the public property rights of the resources and the investor of the ecological products, naturally enjoys double benefits. Of course, the government can transfer the revenue because of the necessary input for the public service.

The third matter concerns how to set the form of income scientifically. The realization forms of ecological product income are diverse. The most common form is the same material income as that of the common market products. For example, the most general monetary income includes direct monetary income, stock appreciation equivalent to monetary type, and material pricing. In addition, there are non-material benefits, which can also be called hidden benefits, such as the optimization and improvement of production and living environments, the improvement of the functional levels and service quality of supporting facilities, and the improvement of the happiness index of stakeholders. In fact, in view of China's economic and social development, it should be more suitable to take the form of combination of material income and non-material income, or even the form of pure non-material income, which is more conducive to the sustainable development of an economic society.

## Ecological Risk Management of Products

Ecological risks have attracted people's attention through the economic and social development. Generally, ecological security can be defined as the degree of protections for human production, life and health, which are not affected by ecological damage and environmental pollution. This includes basic elements such as drinking water food safety, air quality and green environments (Xiao & Chen, 2002). In essence, the risk of ecological products comes from not only the ecological risks, but also from the technical and market risks related to ecological products. However, no matter what kind of risk it is, the main content of risk management mechanisms is consistent and includes three elements.

### **Risk identification and assessment.**

The risk sources of ecological products are diverse and can be roughly divided into two areas. One is the uncontrollable factors that form naturally, such as geological disasters, meteorological disasters, sudden diseases, and other uncontrollable factors. The other is human factors such as unreasonable ecological development and utilization, technical errors in product development, and unqualified product delivery. Of course, there may be a combination of natural and human factors. Therefore, it is particularly important to establish a suitable risk identification and assessment system for ecological products. At present, the state has implemented the relevant system requirements and technology applications in some fields, such as product energy consumption identification, industrial "three wastes" (waste water, waste gases and residues) emission standard system, and the "*san pin yi biao*"<sup>①</sup> agricultural product certification system. However, these systems are limited to specific products and industries and the comprehensive risk assessment of ecosystem services, such as the stability of the regional water and soil supply, is still in the early development stage, which causes great obstacles to the realization of the valuation of ecological products in the broader sense.

### **The risk disposal mechanism.**

Generally, the risk disposal of ecological products includes active disposal and passive disposal. Active disposal generally includes the recovery and improvement of the products or services provided by the supplier, while passive disposal is generally terminated by the corresponding market or administrative supervision subjects punishment. According to the actual situations, passive disposal is often used, such as environmental law enforcement, and industrial and commercial fines for non-standard products. However, this form of risk disposal has an adverse effect with time-delays and faces a large social cost which is often difficult to make up for the existing losses, and it is easy to lead to "rent-seeking" of rights. Therefore, we should find a way to transfer a product's risk to the supply costs and construct a complementary risk disposal

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① Pollution-free agricultural products, green food and organic agricultural products and geographical indications of agricultural products generally referred to as the "*san pin yi biao*".

mechanism of market.

### **Dispute arbitration for ecological product transactions.**

Disputes about ecological environments have always existed. Because the ecological products and the ecological environment are closely related, they will inevitably encounter the same problems. Settlement mechanisms for environmental disputes, such as reconciliation, mediation, administrative treatment and litigation, all have great limitations. However, as a typical mode for civil disputes coordination of civil state power, arbitration is more effective than simple civil consultation and pure court judgments in solving ecological products disputes and other risk issues. However, due to the imperfection of the market system of ecological products and the construction of an ecological civilization system, the dispute arbitration mechanisms related to ecological products also face many problems. The existing arbitration mechanisms and relevant implementations, such as environmental dispute arbitration, are basically implemented by the dispute arbitration mechanism of general civil disputes. However, because of legislative restrictions, property rights definitions and public awareness (Liu & Tian, 2007), the dispute arbitration for ecological products or services with “publicity” or “quasi-publicity” are mostly non-existent. Therefore, it is particularly urgent to establish and improve ecological products dispute arbitration mechanisms which are compatible with the property rights system, laws and regulations and the market system of ecological products.

## **Innovative Ways to Realize the Value of Ecological Products**

Combined with the existing research, in order to innovate the approaches to realizing the value of ecological products from the directions of market-oriented management and public compensation, we should focus on the common characteristics and individual differences of the ecological products, and stand on the basis of constantly improving the mechanism system, which is necessary for the value realization of the ecological products. In addition, we should also take overseas experience as a reference, combining this with national conditions.

The first is based on market operations. It is about through the platform, which is based on the legal definition of the property rights of the ecological products, and the corresponding development rights derived around the development and utilization of the products, such as water pollutant emission rights, carbon emission rights, and ecological and environmental protection products identification rights. According to the different transaction subjects and forms, this platform can be divided in three ways.

Direct transactions between the supply side and the demand side of ecological development rights. This is basically consistent with general commodity transactions. The specific steps include: First, product design, which refers to the establishment of ecological development rights for innovation and development of ecological resources; second, product bidding, which refers to the supply side and the demand side conducting fair bidding around the guiding price which



is formed by the methods of evaluation for ecological resources values, and completing the transactions using the corresponding principles; third, product transaction, which refers to the fair transaction of ecological development rights under the conditions of market access and the completion of registration or filing of the property rights; fourth, product consumption, which refers to the transaction of the development rights, the utilization of the ecological resources or the ecological products based on the content of the property rights and the obtaining of income after the transaction. This approach is generally applicable to private ecological products with simple property rights and less external influence.

The government or public organizations should receive and reserve the ecological development rights, which is a second transaction with the third party and is similar to the transaction of public goods or quasi-public products. The specific steps include: First, property rights collection and storage which refers to the government or other public organizations with the power to collect and store the ecological resources or ecological products to be developed and utilized; second, planning and designing, which refers to the suppliers who carry out a product marketing plan according to the regional development; third, price hearings. In view of the particularity of public rights collection and storage, public hearings will be adopted in the process of product delivery; fourth, product trading, which refers to the fair transaction of ecological development rights under the condition of market access and the completion of registration or filing of the property rights; fifth, supervision after supplying, which refers to the government and other organizations with public power who supervise the consumption behavior of products based on the need to reasonably protect public rights and interests to reduce any negative external influences as far as possible.

Transfer and cooperation of ecological development rights. This belongs to the compound trading mode of multiple participation, which is more of a cooperative mechanism. The specific steps include: First, value quantification, which refers to the quantifying of the subject matter or non-material ecological products as the basic characterization of the transaction of the right to ecological development; second, stock cooperation, which refers to all sides reaching a share agreement to build a cooperation mechanism for the development and utilization of the product development right while taking the product value as a reference; third, transfer operation, which refers to the parties to joint-stock cooperation agreeing on the forms of using and management, according to the real situation regarding consumption and supervision; fourth, income distribution, which refers to all sides sharing the benefits from the products, which is based on the agreements on sharing income in joint stock cooperation.

The second is based on ecological public compensation. It is about restricting the realization of the benefits of market-oriented operations and development rights of different regions and entities through public power according to different objects, which are based on the legal definition of the property rights of ecological products. This method aims to achieve a particular goal, such as public security, through tax or ecological income compensation. The realization mode of the value

of ecological products is usually called “ecological compensation” which can be divided into two specific ways, based on the different objects.

Compensation for the supply of ecological products, which means the ecological compensation is mainly for the body of the ecological products suppliers. The models include “returning farmland to forest” and “returning grazing land to grassland.” There are three main steps: First, formulating the compensation standard, that is, quantifying the degree of the income restriction of the transaction of the ecological development right and formulating the corresponding compensation standard system in combination with the relevant policy requirements; second, carrying out compensation accounting according to the actual rights and interest losses of the beneficiary to be compensated, and the compensation shall be checked and registered according to the appropriate compensation standard system; third, transferring payment implemented by the governments at all levels, or requiring public authorities to realize the compensation through special financial transfers.

Compensation for consumption of ecological products, which means that the ecological compensation is mainly for the consumers of the ecological products. Models include “energy saving subsidies,” “environmental protection subsidies” and “free tax deductions.” There are three main steps. First, formulating the compensation standard by calculating the space balance of the transaction of the right to ecological development in the development and utilization of ecological products, and formulating a reasonable compensation standard system in combination with the relevant policy requirements. Second, carrying out compensation accounting and combining the actual consumption savings or income loss of the intended beneficiary according to the corresponding compensation standard system. The compensation accounting, verification and registration procedures should be carried out. Third, transferring payment implemented by the governments at all levels or requiring the public authorities to realize the compensation through special financial transfers.

The ways of realizing the value of ecological products discussed above are not mutually exclusive. According to the differences between private benefits and public welfare attributes of ecological products, there might be overlapping use of different realization paths. In addition, as far as a single way is concerned, there may also be some supplements including green financial support, policy, and institutional incentives in specific links.

## Conclusion

First, we should accelerate the construction of the ecological property rights system. According to the design concept of ecological products, the definition of property rights is the logical starting point for the realization of the value of ecological products. Whether it is public property rights or private property rights, the ownership relationship should be clearly defined, and relatively sound and complete powers and functions should be given to ensure the effectiveness of the

market-oriented mechanism. China should speed up the construction of its property rights system in the field of ecological resources and ecological products, formulate corresponding laws and regulations, and implement corresponding policy guidance.

Second, we should focus on the cultivation of the main supply of ecological products. We should adhere to the idea of “government supply” and “market supply” in parallel, give full play to the market laws, create a good policy environment for the cultivation of business entities in the fields and markets of ecological products, stimulate the market potential of ecological products, and then promote the development of new industries in the ecological field, realize the qualitative change from ecological protection to ecological development and utilization, and create a national ecological growth pole of economic development.

Third, we should improve the value service system of ecological products. Guided by the connotation of the mechanism for realizing the value of ecological products, we should constantly improve the platform construction and functional service construction including research for an ecological property rights system, the innovation of ecological products, the evaluation of ecological values, and the construction of functional services.

Fourth, we should establish a national ecological economic accounting system while developing a catalogue of ecological products and a value system for ecological products. This ecological economic accounting system should be connected to the current national economic classification accounting system to accelerate the establishment and improvement of a management system for ecological assets including the production and consumption of ecological products in the national economic and social development plan.

Fifth, we should strengthen the supply guarantees of fiscal and financial policies. We should formulate policies and measures including finance and insurance to support the development of ecological products industry, increase financial input, improve policy mechanisms, deepen policy connotations, and develop policy tools to form a complementary and closely policy guarantee system for the realization of ecological product value.

Finally, we should guide the establishment of ecological product consumption concepts. Through in-depth publicity, sample demonstrations, reward and punishment mechanisms and other means we should continuously strengthen positive ecological concepts in economic and social life, guide the formation of a good awareness of ecological product consumption, and gradually improve the overall layout of an ecological society.

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(Editor: Xu Huilan)

# *The Information Efficiency of QFII's Investment in China's Capital Market*

Sun Xianchao

Sichuan Normal University

Zhao Xiaolei

Arizona State University

Liu Xinran

Nankai University

Dong Jianming\*

Southwest University of Finance and Economics

**Abstract:** This paper takes stock price synchronization and price delay as indicators of information efficiency, and uses mixed cross-sectional data of listed companies into which Qualified Foreign Institutional Investors (QFII) have made investments, to study the impact of QFII's investment behaviors on the information efficiency of China's stock market. The results show that QFII's investments can improve the information efficiency of China's stock market, but its impact is varied. The impact of QFII's investments on market information efficiency is more significant in bear markets than in bull markets, the impact on private enterprises is more significant than on state-owned enterprises, and the impact on Small and Medium Enterprises (SME) market is more significant than in main board market. Further research also finds that QFII has a certain threshold effect on the information efficiency of China's stock market. This research paper provides a problem-solving perspective for China's capital markets to achieve information efficiency through opening up, and at the same time warns against financial risks.

**Keywords:** Qualified Foreign Institutional Investors, stock price synchronization, mixed cross-sectional data, information efficiency

**DOI:** <http://dx.doi.org/10.19873/j.cnki.2096-0212.2021.02.011>

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\* Sun Xianchao, Sichuan Normal University, China; Zhao Xiaolei, Kerry School of Business, Arizona State University, US; Liu Xinran, Nankai University, China; Dong Jianming, Southwest University of Finance and Economics, China.

Correspondence concerning this article should be addressed to Liu Xinran, Nankai University, Tianjin. Email: 1529505055@qq.com



## Introduction

**W**ith the development of China's capital markets, the scale of financing continues to grow. However, the investment scale of residents fluctuates periodically, and the markets often rise and fall sharply. In bull markets, the trading volume is booming, while in bear markets, the volume shrinks sharply. Furthermore, the bull markets are fairly short while the bear markets usually last longer. Stock prices fluctuate sharply between high and low levels, which means there is a serious deviation between the capital markets and the real economy, and that the pricing function of the capital markets in China has not been well developed. In order to build efficient capital markets, the Chinese government has made unremitting efforts, such as strengthening the construction of market reputations, and comprehensive governance of listed companies, trading systems and issuance systems. Among them, opening to the outside world is an important policy. In April 2018, at the Boao Forum for Asia Annual Conference, Xi Jinping in his keynote speech pointed out that several significant initiatives would be launched to continue enhancing the opening-up of financial markets. The government should take measures to ensure the implementation of measures to raise foreign equity caps in the banking, securities and insurance industries. At the same time, we will make more moves toward further opening, including accelerating the opening up of the insurance industry, easing restrictions on the establishment of foreign financial institutions in China and expanding their business scope, and opening up more areas of cooperation between Chinese and foreign financial markets.

Since China joined the World Trade Organization (WTO) in 2000, it has opened its capital and financial accounts in an orderly manner. In capital accounts, free convertibility has been achieved. Foreign direct investment (FDI) in China and Chinese enterprises' foreign direct investment (OFDI) have emerged. In the process of capital accounts' opening up, a large number of foreign enterprises have come in, while a large number of Chinese enterprises are investing abroad. In this process, China's local economy is internationalized, and Chinese local industries and products are developed. Overall, the operational efficiency is effectively improved. Besides, in the opening up of financial projects, the state has implemented QFII and qualified domestic institutional investors (QDII) since 2003. Through the opening of capital markets, the Chinese government tries to improve the efficiency of these markets, promote reforms in domestic finance, and optimize the allocation of resources throughout the world to realize its national strategies, such as the internationalization of the RMB. Of course, the process of opening up is bidirectional. We can achieve the goal by combining introduction with going global. In order to study the opening of capital markets more carefully, this paper intends to study the successful experience of foreign direct investment (FDI) in China's economic growth, and analyze the impact of foreign institutional investors on the information efficiency of China's capital markets. As a financial institution coming from mature capital

markets, whether FDI can play its role in improving China's capital markets, especially in asset pricing, is the focus of this paper. This paper studies the information efficiency of China's stock market from the perspective of the introduction of foreign institutional investors and increase of openness. Also, this paper studies the logical chain between QFII and information efficiency and uses empirical methods to systematically test the links. Based on the results of this study, we put forward corresponding policy recommendations.

Unlike previous studies which focused on the impact of financial openness on economic growth and financial risk management, this paper studies the impact of capital flow on the information efficiency of the securities market under the conditions of financial openness. Particular attention is paid to the ability and speed of stock price response information, which is used as a measure of efficiency. The latest literature studies the relationships between the information efficiency of the stock market and the behavior of the regulatory authorities, because improving the efficiency of the stock market is one of the main objectives of the regulatory authorities. In recent years, regulators have made concerted efforts to establish efficient capital markets, as academia continues to research market operations. Both regulators and academia focus on: short selling constraints, internal transaction legislation, investment protection systems and financial liberalization. Theoretical and empirical studies have found that efficient stock prices can effectively guide the optimal allocation of investment resources. This is because a large amount of information is reflected through stock prices, which will guide the decision-making of enterprises and individuals. Therefore, we determine that there is a definite link between the stock market and the real economy (Bond, Edmans & Gold, 2012). And it is of great significance to build an efficient stock market.

This paper uses empirical methods to verify whether foreign institutional investors can improve the information efficiency of China's stock market. We mainly used the synchronization of stock prices, which represents the information content of stock characteristics. In order to test robustness, we used Bae, K.H., Ozoguz, A., Tan, H. & Wirjanto, T.S. (2012) as reference and tested the robustness of the response speed of information by using the price delay index as the representative of stock prices. By using these two indicators, this paper empirically tested the impact of QFII on information efficiency of China's stock market from information content and information reflection speed.

Domestic scholars have relatively little literature on QFII's investments in China, most of which has been developed since 2006. Rao Yulei, Xu Junlin, Mei Lixing and Liu Min (2013) published an empirical study on the synchronization between QFII and Chinese stock prices and their results indicated that in the long run, QFII's investments can help stock prices fully reflect information, improve the information content of stock prices; and reduce the synchronization of stock prices. In the short term, QFII's investments and China's stock prices will show a synchronous feature, and short-term investments cannot improve the information efficiency of stock market. Through robustness tests, we found that QFII's investments in bull markets

will increase the synchronization of stock prices, while in bear markets they will reduce the synchronization of stock prices (Cheng, Liu & Guan, 2014). By using the Sais measure and fuzzy gray matter-element space theory (FHW) measure to expand and compare herding behavior, we empirically analyzed the differences and relationships between QFII and the herding behavior intensity of domestic institutional investors. The results indicate that the herding effect of QFII's investment behaviors is lower than that of domestic institutional investors. In terms of investing in domestic stock market, domestic institutional investors have a better understanding of Chinese local culture and are more familiar with the domestic markets. Therefore, in the herd effect, domestic investors are the leader, while QFII are the follower. Based on the analysis of shareholders' shareholding of A-share listed companies, Wu Weihua, Wandi and Fang Caidi (2011) studied the positions of QFII among the top ten shareholders, and the role of QFII's investments in China's stock market from the perspective of finance and corporate governance. The statistical results show that the financial indicators of the listed companies invested by QFII are obviously better than those of the listed companies not invested by QFII. This shows that QFII stick to value investments in China and their investments promote the Chinese stock market to fully reflect the development of the real economy.

The main contributions of this paper are: First, the information efficiency of foreign institutional investment in China's stock market is discussed from the perspectives of information content and information response based on two indicators of information efficiency: stock price synchronization and price hysteresis. Second, this paper classifies the sample data according to economic cycle, enterprise nature and listed markets and then empirical analysis found that bull markets information efficiency is slightly lower than that of bear markets. Also, the information efficiency of QFII to state-owned enterprises is lower than that of private enterprises. Third, this paper examines the non-linear relationship between foreign institutional investors and information efficiency in the stock market.

The specific contents of this chapter are as follows: Part 2 deduces the logical research hypothesis and derives four research proposition hypotheses; Part 3 constructs the model and explains the variables; Part 4 empirically analyses the impact of QFII's investments on the information content of stock market based on the index of stock price synchronization; Part 5 is a series of robustness tests based on information reaction speed and other indicators. After that, the content of this paper is summarized.

### **Research Hypotheses**

Capital markets play an important role in economic growth; financing and optimizing the allocation of resources; promoting the reform of the state-owned economy; and developing a socialist market economy with Chinese characteristics. Therefore, it is of great significance to establish efficient capital markets. The role of a stock price in guiding resource allocations

depends on its ability to reflect the real information of an enterprise, which is pricing ability. The ability of a stock price to respond to information is an important indicator of the efficiency of a country's securities market (Jun & Guo, 2014). Various measures have been taken to build a stock market with efficient pricing mechanisms, and the QFII system is one of them. QFII system was born in the mature capital markets. They usually adhere to value investments and focus on mining the specific value information of their potential investment targets. In terms of searching and screening information, QFII are more accessible to information than individual investors, and is often considered as informed traders in the markets. They have economies of scale and run a team of professional analysts at a lower cost. Their ability to acquire and process information is far better than that of individual investors (Deng & Sun, 2014). In terms of information transmission, once a company's stock is held by QFII, it is likely to send a signal to the markets that the company has strong profitability and good corporate governance. Because of its value, investments, and the ability to acquire and process information, QFII can adequately respond to some real and potential information of the stock market, It will play a positive guiding role in the capital markets, thus improving the information efficiency of the markets. Through the analysis above, it can be concluded that the first way QFII can improve the information efficiency of stock market is to transmit effective information to the markets through trading (Bae, Ozoguz, Tan, & Wirjanto, 2012). The study finds that foreign institutional investors have a high international vision and financial literacy. They can handle and use information more skillfully and transfer private information to stock prices through trading.

After foreign institutional investors enter China, they will influence the information efficiency of domestic stock market through capital input and trading, which are discussed above. Another aspect of the impact of foreign institutional investors on the information efficiency of domestic stock market is to influence the behavior of market participants through market mechanisms, which will promote the optimization of market participants and information efficiency. Market participants are mainly listed companies, domestic investors, and governments. The introduction of QFII can promote the optimization of market participants through market mechanisms, which include competition mechanisms, technology demonstrations, personnel mobility, and industrial chain associations.

In terms of the development of listed companies, QFII can actively participate in the corporate governance of listed companies, restrain the behavior of internal shareholders, and can even optimize listed companies by providing advice and suggestions for development. QFII can also select listed companies with future development prospects through market testing to realize the optimal allocation of resources.

From the perspective of domestic institutional investors, the theoretical premise of asset pricing is the rationality and expertise of investors. Only with it can we realize the construction of the optimal portfolio and find arbitrage opportunities in the markets. These characteristics have enlightening effects on thinking about the information efficiency of the stock market from the

demand side. With the introduction of QFII, based on competition mechanisms and demonstration effects, the professional technology of domestic institutional investors has increased, thus promoting the construction of the optimal portfolio.

In terms of institutional construction, with the introduction of foreign institutional investors, their investment habits and requirements in mature capital markets will promote the institutional construction in domestic capital markets, including the promulgation of a legal system, the revision of accounting standards and the improvement of trading systems, thereby promoting the development of the capital markets.

Therefore, it can be concluded that QFII carry out corporate governance on listed companies through investments and demonstrate their role to other investors with a high level of investment, thus realizing the information efficiency of the stock market. Based on the discussion of the above two perspectives, we can deduce Hypothesis 1.

*Hypothesis 1: The introduction of foreign institutional investors (QFII) has brought capital and technology to China's capital markets. Capital transactions transmit more private information to the markets, and professional investment technology promotes the optimization of market participants, thus improving the information efficiency of the stock market.*

China's stock market is less developed. The speculative circumstance there is relatively strong, which often leads to sharp rises and falls. QFII's investment in China will inevitably be affected by such circumstance. In addition, the governance structure of listed companies in China needs to be improved. Financial integrity is not yet sound. When foreign institutional investors have certain advantages in China, their risks will be exposed. As QFII have no obvious information advantages over domestic institutional investors, once the markets are not clear, they will take follow-up actions for domestic institutional investors, thus forming a herding effect (Xu, Yu & Yi, 2013). Regulators often take administrative control measures to curb the outbreak of financial risks in extraordinary periods. However, there may be a situation where the government cannot regulate the foreign investment institutions, or where supervision is not effective. Through literature research, we find that there is no linear relationship between QFII positions and the information efficiency of China's stock market. The information efficiency of the stock market will be reduced if the stock holdings exceed a certain proportion, which will lead to the exposure to financial market risks (Lim, Hooy, Chang & Brooks, 2016). In the early period of the opening up of China's capital markets, the government was relatively cautious about foreign investors. Its supervision was stringent and the QFII selected were all financial institutions from overseas mature capital markets. They operated steadily and advocated value investments and long-term investments. Besides, in the aspect of portfolio allocations, the allocation ratio of foreign financial portfolios to China's stock assets was lower than that of other global assets. Even if China's capital markets fluctuated sharply or other uncertain events occurred, the impact on foreign financial institutions was relatively limited. So QFII's investment portfolio in China was relatively stable.

With the opening up of China's financial markets and the loosening of regulations, some small and medium-sized QFII have also begun to invest in China's capital markets. Thus, the number of foreign institutional investors in China's capital markets is gradually increasing. At this time, QFII's allocation ratio of Chinese assets begins to rise in its global portfolio. The fluctuation of China's stock price will have a significant impact on its entire portfolio. This will increase QDII's attention to China's capital markets and increase the flexibility of China's capital markets.

In the eyes of foreign institutional investors, China's stock market is immature. Because China's stock market is one of the largest in the world, once QFII's position in China increases to a certain extent, QFII's attention to China's stock market will increase. In addition, the immaturity of China's capital markets and the uncertainty of policy, the competitive development of stock market globally, and the fluctuations of international exchange rates will lead to a large inflow and outflow of international funds, which will affect the volatility of the markets, and even have a huge impact on their stability. The pricing function of stock market will be destroyed.

Based on the logic of adverse selection, in the early stage of the capital market opening up, the state must have stricter supervision. Most of the foreign institutional investors who can enter the country are those with better qualifications, larger scale, and a more stable investment style and they all adhere to value investments and long-term investments. Therefore, they will abide by the Chinese government's system and continue their investment behaviors in the mature capital markets. They will play a positive role in the markets.

With the increasing degree of financial liberalization, some foreign institutional investors with poor qualifications and small scale will enter China one after another, and then the markets will be mixed. At the same time, domestic institutional investors will pay more attention to the investment targets of foreign institutional investors. When excellent foreign institutional investors pay the cost to actively mine the value of their investment targets, other poor foreign institutional investors and domestic investors will follow their investment behaviors. Thus in the short term, a stock price will be pushed to a higher position, resulting in a decline in the rate of return of excellent foreign investment institutions. This kind of hitchhiking behavior eventually leads to foreign institutional investors reducing their enthusiasm for value mining, and the efficiency of market information begins to decline. Based on the analysis above, we will get Hypothesis 2.

*Hypothesis 2: There is a non-linear relationship between the investment scale of QFII and the information efficiency of Chinese stock market. When the investment scale reaches a certain threshold, the information efficiency of the stock market will not increase but decrease.*

Studying the US stock market, we find that the US stock price index shows a continuous upward trend. Are the US stock market price indices not adjusted? Based on empirical studies, we found that the adjustments of the US stock market is not achieved through price declines, but by the rise of earnings per share. That is why value investments are popular on Wall Street. On



the contrary, bull markets and bear markets alternately appear in China's stock market. The price index changes show a cross-sectional trend in the long run. The market always alternates in the ups and downs. China's stock market realizes value discovery by adjusting the price substantially. Due to the fluctuations, the stability of the market is impaired, and it also damages the function of the capital markets in serving the real economy. Based on this fact, we want to verify whether the impact of QFII's investment behaviors on the information efficiency of stock market is the same in bull and bear markets.

In bull markets, the markets are active and noisy, and the price shows obvious synchronization (Rao, Xu, Mei & Liu, 2013). Almost all stocks show a rising trend in varying degrees. Due to the influx of capital, the stock prices of some listed companies with poor performance also rise. During these times, people often ignore bad information as the markets are in a state of fanaticism, and the poor companies have hitchhiked along with the good companies. The asset pricing function of the markets has declined. As an institutional investor, company-specific information is concealed in noisy transactions. As the price rises, QFII will follow the price index to buy stocks, which intensifies the deviation of market price from value. The markets cannot distinguish excellent listed companies from inferior listed companies by price. The asset pricing function of the markets has declined.

In bear markets, prices continue to fall. Stock indices may even show some extreme movements, such as 998 and 1164 in the history of China's stock market. At this time, the price of many stocks has been seriously lower than their intrinsic value, especially for some excellent listed companies. The investment cost is low, and it will achieve a stable rate of return in a long-term investment. At this time, institutional investors (especially QFII) become relatively rational relative to individual investors. A QFII increases its stock purchases in a bear market, which can be evidenced by the QFII's quarterly investment quota published by the Foreign Exchange Administration. In bear markets, QFII's investments stabilize the markets, corrected the markets price, and reduce the synchronization of the stock market. Another phenomenon is that in bear markets, many investors began to withdraw from the markets because of panic. The markets declined due to systemic risk and liquidity tensions. The volume of market transactions drop sharply and the market pricing functions are lost. At this time, the Chinese government will often inject capital into the markets through variable measures including loosening monetary policies, relaxing the approval of QFII inflows, and encouraging more foreign liquidity to flow into the country. At this time, despite the market risks, foreign institutional investors will take advantage of this opportunity to apply for investment quotas to enter the Chinese market for long-term investments. Therefore, in the context of the economic cycle, whether QFII's investments in China's stock market have a certain degree of heterogeneity is worth further empirical testing, thus two opposite propositions can be drawn.

*Hypothesis 3a: In bull markets, QFII's investments have no significant impact on stock information efficiency. In bear markets, QFII's investments will increase the information efficiency and reduce the synchronization of stock prices. Under both markets, the impact of QFII on stock information efficiency*

is heterogeneous.

*Hypothesis 3b: QFII can achieve the information efficiency of Chinese stocks and reduce the synchronization of stock prices in both bull and bear markets.*

China's securities regulatory authorities have been committed to establishing a multi-level capital market to provide financial support for Chinese enterprises at all levels. There are three sectors in Chinese stock market, namely, main board market, and China Growth Enterprise Market (GEM). There are some differences in the listing requirements of enterprises in the three sectors of the markets. Among them, the enterprises listed on the main board market are mainly state-owned enterprises with large market values. The enterprises listed on SMEs are medium-sized state-owned enterprises, collective enterprises, and private enterprises. The enterprises listed on GEM are mainly small and medium-sized private companies.

In China, the reform of the urban economy has always been an important issue of economic development, the core of which is the reform of state-owned enterprises. Large state-owned enterprises are the main listed enterprises in the main board market. State-owned enterprises are not only profit producers in China, but they also bear important social, political, and economic responsibilities such as promoting China's economic transformation and development, and increasing social employment. But, the unclear property rights of state-owned enterprises, low operational efficiency, slow industrial development and upgrading all seriously restrict the pace of economic development in China. As their large market values are highly related to the development of the national economy, the market information of state-owned enterprises is more transparent. Can we improve the information efficiency of state-owned enterprises through investment transactions? Can we reduce the synchronization of the share price of state-owned enterprises by optimizing market entities?

If SMEs want to survive in the SME sector, they must provide better products and services and get the recognition of the market. So, in their operations, they will play the role of a producer as appropriately as possible. In addition, small and medium-sized enterprises were born at the late period of Reform and Opening Up. So, they have the characteristics of the new economy. Compared with the industries in the motherboard market, the industries that SMEs are engaged in are in the initial development stages, so these enterprises have special characteristics. The industries that state-owned enterprises are engaged in are mature and stable industries. Each state-owned enterprise in the same industry has a highly similar business capability and business development model. But small and medium-sized enterprises may be obviously different in profitability among enterprises in the same industry. QFII select investment targets mainly based on the development and profitability of enterprises. QFII lack the advantages of political resources in China, and there is no interest relationship between them and Chinese industries. So, they will select companies with industry development advantages and profitability in the markets, thus reducing the synchronization of stock prices and improving the information efficiency of asset prices. Accordingly, we put forward Hypothesis:

*Hypothesis 4a: QFII's investments can improve the information efficiency of stocks, both in the main board market and in the small and medium-sized board markets; both in state-owned enterprises and in private enterprises.*

*Hypothesis 4b: For the state-owned enterprises in the main-board markets, QFII's investments have no significant impact on their information efficiency. For private enterprises in the SME market, QFII's investment can reduce the synchronization of stock prices and improve the information efficiency of the stock market.*

## Models, Data, and Descriptive Statistics

### Models

Based on M. Schuppli, M.T. Bohl (2010) and Cho-Min, Lin et al (2007), the basic assumption of this paper is that the QFII system is an open and innovative system in China's capital markets, which is conducive to the price discovery function and improves the efficiency of capital market asset pricing. Based on the hypothesis deduced above, the relationship between QFII's position and information efficiency of China's stock market may be non-linear. Referring to the model setting methods of Kian-Ping Lima, Chee-Wo Hooyb, Kwok-Boon Changc, Robert Brooksd (2016), Li Zhisheng, and Chen Chen (2015), we construct the framework of this study:

$$Efficiency_{i,t} = \alpha_0 + \gamma_1 \times QFII_{i,t} + \gamma_2 \times QFII_{i,t}^2 + \gamma_3 \times Controls_{i,t} + \varepsilon_{i,t} \quad (1)$$

In the model,  $i, t$  represent the sample individuals and time of the study.  $Efficiency_{i,t}$  is the information efficiency index of stock  $i$  at time  $t$ . The explanatory variables are: the proportion of QFII's holdings' market value to public shares  $QFII_{i,t}$ , and the square of QFII's holdings' market value to public shares  $QFII_{i,t}^2$ .  $Controls_{i,t}$  are a series of control variables. The selection of control variables is shown below.

In order to test the non-linearity of foreign institutional investors' information efficiency in the stock market, a quadratic term is set in the following model 1. According to the derivative relationship, here is:

$$\frac{\partial Efficiency}{\partial QFII} = \gamma_1 + 2\gamma_2 QFII \quad (1)$$

According to the expectation hypothesis of the study, if QFII's investments can reduce the synchronization of stock prices, and there is a non-linear relationship, then we expect:  $r_1 < 0$ ,  $r_2 > 0$ . According to the results of the derivation of the quadratic term, it can be determined that the location of the obedient point is:

$$\frac{\partial \text{Efficiency}}{\partial QFII} = \gamma_1 + 2\gamma_2 QFII = 0$$

$$QFII = \frac{-\gamma_1}{2\gamma_2}$$

## Variable Selection

### Target variable — stock information efficiency.

#### *Price synchronization index.*

The price synchronization index is based on the method of Roll's (1988)  $R^2$  and the research of Mork (2000). The CAPM model is used to obtain the index  $R^2$  of the market's explanatory ability to individual stocks.

$$r_{i,t} = \alpha_i + \beta_{i,t} r_{mar,t} + \varepsilon_{i,t} \quad (2)$$

In modal (2),  $r_{i,t}$  is the weekly return rate of the sample stocks in the  $t$  period. Since dividends are seldom distributed among Chinese stocks, the weekly return only considers the return due to stock price fluctuations.  $r_{m,t}$  is the market index weighted weekly rate of return. In this paper, the Shanghai and Shenzhen 300 index, which is a representative index in China's capital markets, is used as the market return rate. According to the principle of econometrics, in the regression of model (2), the meaning of  $R^2$  is the degree of explanation of the market return rate to individual stock return rates. Therefore, the bigger  $R^2$  is, the more the stock price fluctuation is explained by the markets, and the more synchronous the market fluctuation is. Stocks are characterized by the same rise and fall as the markets. According to the  $R^2$  of the regression model, to ensure that the variables obey the normal distribution, the logarithmic transformation is made into:

$$\text{Synchronicity} = \ln\left(\frac{R^2}{1-R^2}\right) \quad (3)$$

Model (3) is the price synchronization index. The larger the price synchronization index is, the lower the information efficiency of the representative stock is, and to the contrary, the information is more efficient. In some research literature, researchers also use a price asynchrony index. Price asynchrony is the opposite number of price synchronization indicators, which can be expressed as:

$$\text{idio} = \ln\left(\frac{1-R^2}{R^2}\right) \quad (4)$$

### *Price hysteresis index.*

Hou and Moskowitz (2005) argues that information efficiency can be measured by using the reaction speed of stock prices to market information. The method is to construct a market yield lag index (Bae, Ozoguz, Tan, Wirjanto, 2012). If a single stock return rate can fully respond to the current market return rate, it is considered that the stock response to information is fast and the asset information efficiency is high. If a single stock's return cannot fully respond to the current market returns, but absorbs the response in the subsequent time, thus forming the lag characteristic of the response, then, this characteristic can be embodied by the extended form of the lag order single factor model (Bae et al. 2012).

$$r_{i,t} = \alpha_i + \sum_{k=0}^n \delta_{i,k} r_{mar,t-k} + \sum_{k=0}^n \beta_{i,k} r_{ind,t-k} + \varepsilon_{i,t} \quad (5)$$

Bae, K.H., Ozoguz, A., Tan, H., and Wirjanto, T.S. (2012) think that the information efficiency of stocks can be reflected by the reaction speed of price to information. Their ideas are easy to apply and verify. After regression of model (5), two different price hysteresis methods are constructed to measure the information efficiency of stocks. We constructed the following two constraint models.

$$r_{i,t} = \alpha_i + \beta_{i,t} r_{mar,t} + \varepsilon_{i,t} \quad (6)$$

$$r_{i,t} = \alpha_i + \beta_{i,t} r_{mar,t} + \sum_{k=0}^n \beta_{i,t-k} r_{mar,t-k} + \varepsilon_{i,t} \quad (7)$$

Using the data from 2006 to 2017, the total regression of model (7) is carried out and the coefficient of determination is the obtained  $R_-^2$ . Using the method of Hou and Moskowitz (2005) to measure price hysteresis, we constructed a model (8). This is the variable expression of price hysteresis. Intuitively, the smaller the delay value, the lower the dependence of stock returns on historical market information, the shorter the time it takes stock prices to absorb market information, and the higher the information efficiency.

$$delay = 1 - \frac{R_u^2}{R_-^2} \quad (8)$$

### **Explanatory variable.**

#### *Key explanatory variable.*

The key explanatory variable is the ratio of the market values of QFII's positions to public shares and its square. Listed companies report the types of investors in each financial reporting

period. The financial reports of listed companies will also report the positions of the top ten shareholders in listed companies. In its information disclosure, the Shanghai and Shenzhen Stock Exchanges regularly announce changes in the amount of QFII holdings. This paper chooses the square of the QFII's position ratio and the QFII's position ratio published in the accounting reports as key explanatory variables.

Key explanatory variables use position data to show foreign institutional investors' views on their investment targets. Another approach is to use data ratios for transactions with listed companies. However, considering the long-term investments, the QFII's position ratios can better show the long-term and stability of their investments than the transaction data ratios. Trading data may be the result of random disturbances in some markets, so the position data can more truly reflect the investment information. But position data may filter out some responses to information. Considering the value of the study, we used the position ratios to represent the key explanatory variables.

#### *Control variable.*

The controlling variables include the listed company's circulation market size, stock price level (P), domestic institutional investor's position ratio (Dinst), number of ratings by rating agencies (Analysts), volume, turnover, first largest shareholder's holding ratio (First1), top ten shareholder's holding ratio (First10), asset-liability ratio (Lev) and stock weighted average price-earnings ratio (PE).

Table 1 gives a summary of the variables used in the article, and the following research will make an empirical analysis of these variables.

Table 1 Definition of Variables

Variable Name	Definition
Panel A: Explained variable	
Synchronicity	Calculations based on formulas (6-2) (6-3)
Idio	Calculations based on formulas (6-2) (6-4)
Delay	Calculations based on formulas (6-5) (6-8)
Panel B: Explanatory variable	
QFII	QFII's positions in the proportion of public shares in the industry (%)
QFII <sup>2</sup>	The square of QFII's positions in the proportion of public shares in the industry
Panel C: Control variable	
Dinst	Domestic institutional investor's position ratio
Ln (Size)	The natural logarithm of the market value of listed companies in circulation
Ln (volum)	The natural logarithm of stock trading volume
Ln (Analysts)	The natural logarithm of the number of ratings by domestic rating agencies
Ln (Turnover)	Natural logarithm of turnover rate



Variable Name	Definition
First1	Shareholding ratio of the largest shareholder
First10	Top ten shareholder's holding ratio
Ln (Lev)	The natural logarithm of the asset-liability ratio, which reflects leverage.
PE	Weighted average price-earnings ratio (PE)

### Data Source and Statistical Description.

The data in this paper are based on the QFII-held stocks in the Shanghai Stock Exchanges and Shenzhen Stock Exchanges. The markets range from the first quarter of 2013 to the first quarter of 2017. Some data were eliminated: First, data with short holding time of QFII were screened out. Some stocks were only temporarily held by QFII and they lack representativeness and were eliminated from our study. Second, stocks suspended or specially treated by the exchange were excluded. Sample datas were mainly obtained through Wind Information. Data that could not be collected through Wind Information was collected manually through the China Stock Market & Accounting Research Database (CSMAR).

Table 2 Descriptive Statistics for All Variables

	QFII	QFII <sup>2</sup>	Dinst	Ln (P)	Ln (Size)	Ln (Analysts)	Ln (Turnover)	Ln (volum)
Mean	1.70	8.91	46.76	2.64	13.63	2.06	4.49	20.06
Medium	0.97	0.95	48.94	2.55	13.45	2.20	4.53	20.02
Maximum	18.86	355.57	102.76	6.14	18.75	3.56	7.28	25.39
Minimum	0.01	0.00	0.24	0.97	8.78	0.00	-0.95	12.86
Standard deviation	2.45	34.08	24.37	0.68	1.49	0.88	1.04	1.19
Skewness	3.91	5.96	-0.17	0.84	0.54	-0.76	-0.56	0.23
Kurtosis	20.30	40.58	2.14	5.52	3.59	2.86	4.48	4.44
Numbers	3576	3576	3576	3576	3576	3196	3524	3524
	First1	First10	Ln (Lev)	Short Sal	PE	Synchronicity		Delay
Mean	38.81	61.29	3.61	0.48	72.95	-1.22		-1.55
Medium	37.12	62.49	3.73	0.00	31.50	-0.98		-0.25
Maximum	89.41	98.55	6.74	1.00	800.00	1.62		0.00
Minimum	3.55	8.00	-0.09	0.00	-115.65	-8.91		-447.16
Standard deviation	16.75	15.95	0.64	0.50	1410.71	1.34		11.74
Skewness	0.43	-0.18	-0.93	0.06	56.68	-1.28		-23.80
Kurtosis	2.61	2.63	4.21	1.00	3342.33	5.65		750.55
Observed numbers	3576	3539	3576	3576	3576	3393		3393

Table 2 presents descriptive statistics of the variables used. QFII holds an average of 1.7

percent of Chinese stocks. The median value is 0.97 percent. The maximum value is 18.86 percent. The minimum value is 0.01 percent. The proportion of foreign institutional investors in China's stock holdings is generally not high. This is due to the limitation of the government's approval quota. Observing the stock price synchronization index and price hysteresis index, we find that the average value of the stock price synchronization index is -1.22; the median value is -0.98; the average value of price hysteresis index is -1.55; the median value is -0.25. Descriptive statistics show that the data are stable.

### Analysis of Regression Results

In this section of the regression analysis, considering that different research objects have different roles in the markets, we used the cross-sectional weighted generalized least squares method (WGLS) with mixed cross-sectional data. The main purpose of this method is to overcome heteroscedasticity and autocorrelation aspheric hypothesis.

#### Baseline Regression—Based on the Full Sample

Table 3 shows the Baseline Regression results of the whole sample. The results of the grouping regression in Table 3 (1)-(4) show that QFII investment has a negative impact on stock price synchronization. The regression coefficient of  $QFII^2$  is positive. All were significant at the 1 percent significance level. The regression results verify Hypotheses 1 and 2, that is, QFII investment in China reduces the price synchronization of the stock market and improves the information efficiency of the stock market. However, with the scale of QFII investment reaching a certain proportion, the information efficiency of the stock market will decline. There is an inverted U-shaped relationship between QFII investment and stock market information efficiency. Column (1) in Table 3 only considers the regression of price synchronization to QFII and  $QFII^2$ . Table 3 (2) adds variables to the regression that reflect the technical trading indicators of the stock market, including Dinst, the natural logarithm Ln (Size), Turnover, and the natural logarithm Ln (Analysts) of the number of ratings by rating agencies. Table 3 (3) lists some indicators that are added to the public fundamentals of listed companies, including First1, First10 and Ln (Lev), which reflects the leverage ratio of assets and liabilities of listed companies. Column (4) shows regression results based on all explanatory variables. Based on the grouping regression results, we find that in terms of the influence of control variables on the information efficiency of the stock market, domestic institutional investors can significantly reduce the synchronization of stock prices, indicating that institutional investors play the role of rational investors in the markets. Institutional ratings and turnover rates also significantly reduce the synchronization of stock prices, indicating that the efficiency of stock information concerned by institutional ratings will be improved. The stocks with higher turnover rates imply that private information is active in the markets and people trade on the basis of private information. The size of the company's circulating market value, the

assets-liability ratio and the proportion of the largest shareholders have a positive impact on the synchronization of stock prices. This shows that the larger the company size, the higher the asset-liability ratio combined with a higher concentration of the largest shareholders, which lead to higher synchronization of stock prices and lower information efficiency.

Taking Regression Table 3 (1) as an example, if the QFII shareholding ratio increases by 1 percent, there will be a decrease of 0.0657 units in stock price synchronization. The inflection point of the second term is:  $QFII = \frac{0.0657}{2 \times 0.0098} = 3.35$ . When QFII holdings reach 3.35 percent, continued foreign ownership will lead to a rise in stock price synchronization.

Table 3 EGLS Regression Results for the Whole Sample

	Synchronicity			
	(1)	(2)	(3)	(4)
QFII	-0.0657*** (-29.9731)	-0.0411*** (-17.2905)	-0.0207*** (-4.4862)	-0.02961*** (-5.0461)
QFII <sup>2</sup>	0.0098*** (29.7775)	0.0059*** (42.6965)	0.0006*** (15.0789)	0.0052*** (12.5270)
Dinst		-0.0060*** (-25.2571)		-0.0063*** (-14.2925)
Ln (Size)		0.2521*** (44.9510)		0.2393*** (35.1523)
Ln (Analysts)		-0.08710*** (-22.9849)		-0.0886*** (-10.0191)
Ln (Turnover)		-0.2042*** (-31.3642)		-0.2178*** (-26.4236)
First1			0.0059*** (15.8659)	0.0030*** (5.7951)
First10			-0.0009*** (-2.8352)	-0.0035*** (-7.0781)
Ln (Lev)			0.2725*** (30.8286)	0.1021*** (14.1635)
PE			8.0523*** (2.3521)	-0.0003*** (-4.3954)
C	-1.1996*** (-92.7235)	-3.2607*** (-37.4065)	-2.4027*** (-54.0551)	-3.2743*** (-40.2882)
R <sup>2</sup>	0.2278	0.2879	0.4644	0.6690
N	3393	3102	3358	2978

Note: The values in () are t-value statistics, in which “\*, \*\*, \*\*\*” represent significant levels of 10 percent, 5 percent and 1 percent respectively.

### Classified Regression Based on Stock Market Cycles

There is the phenomenon of alternating bulls and bears in the capital markets. In China's capital markets, there is a pattern of long bears and short bulls. In different stock economic cycles, the capital markets will show heterogeneity. Studies on institutional investors have found that institutional investors have different investment performance and strategies in the bull and bear markets. So how do QFII perform in the bull and bear markets in China's stock market? This is the focus of this classification. The regression results of tables 4 and 5 show that QFII's investments reduce the synchronization of stock prices, and are significant at a higher level of significance, whether in bull or bear markets. By investigating the two coefficients of QFII, we found that the squared term is also positive, and has a high level of significance. Therefore, we concluded that QFII can promote the information efficiency of the stock market in both bull and bear markets. In the bull and bear markets, the influence of QFII on the information efficiency of the stock market is non-linear, showing an inverted U shape. The impact of QFII on the stock market in the bull and bear markets will lead to a decline in information efficiency after reaching a certain threshold. According to the quadratic formula, the inflection point of the QFII's position is calculated with the regression data in Table 4 (1).  $QFII = \frac{0.0796}{2 \times 0.0109} = 3.65$ . That is, in a bear market, after QFII's position reached 3.65 percent, stock price synchronization began to rise. Based on the regression data in Table 5 (1), the inflection point of QFII is:  $QFII = \frac{0.0527}{2 \times 0.0089} = 4.117$ .

Table 4 EGLS Regression of Bear Markets Samples (2015.q3–2017.q1)

	Synchronicity			
	(1)	(2)	(3)	(4)
QFII	-0.0796***	-0.04806***	-0.0257***	-0.0252***
	(-12.5902)	(-5.4661)	(-4.8588)	(-2.4804)
QFII <sup>2</sup>	0.0109***	0.0075***	0.0067***	0.006***
	(12.9007)	(10.1668)	(9.2199)	(7.5143)
Dinst		-0.0008***		-0.0013***
		(-2.5854)		(-3.8441)
Ln (P)		-0.2748***		-0.255***
		(-34.8202)		(-21.7009)
Ln (Size)				
Ln (Analysts)		0.1011***		0.09336***
		(12.1320)		(9.2821)

	Synchronicity			
	(1)	(2)	(3)	(4)
Ln (Turnover)		-0.3032*** (-22.4222)		-0.3133*** (-33.878)
Ln (Volume)				
First1			0.0087*** (17.5861)	0.0051*** (9.2407)
First10			-0.0021*** (-5.6461)	-0.0061*** (-8.4093)
Ln(Lev)			0.3039*** (13.4352)	0.1786*** (15.3104)
PE			7.8345*** (4.0586)	6.5145*** (0.7186)
Short-sales				
C	-1.1960*** (-40.4954)	0.7013*** (8.7887)	-2.5762*** (-24.4743)	0.2263*** (2.7438)
R <sup>2</sup>	0.1228	0.8638	0.9898	0.7878
N	1337	1187	1323	1173

Note: The values in () are t-value statistics, in which “\*, \*\*, \*\*\*” represent significant levels of 10 percent, 5 percent and 1 percent respectively.

Further research shows that in bear markets, the absolute value of the QFII regression coefficient is significantly greater than that in bull markets. This shows that although QFII can promote the information efficiency of the stock market in both bull and bear market. It plays a greater role in information efficiency in the bear markets. The research on QFII squared shows that the coefficient of QFII<sup>2</sup> in bear markets is significantly smaller than that in bull markets, which indicates that QFII's investments in bull markets will accelerate the critical point of information efficiency in stock market. This paper puts forward valuable suggestions for the supervision of foreign exchange stocks in China: QFII can be encouraged to invest in stocks in bear markets, while staying alert to risk as much as possible in bull markets to reduce damage to the markets. Empirical tests show that foreign institutional investors' investment in Chinese stocks, whether in bull markets or bear markets, has a promoting effect on the information efficiency of Chinese stocks, that and there is a non-linear relationship. Empirical tests verify Hypothesis 3b.

Table 5 EGLS Regression of Bull Market Samples (2013. q1–2015. q2)

	Synchronicity			
	(1)	(2)	(3)	(4)
QFII	-0.0527*** (-21.9756)	-0.04281*** (-8.1076)	-0.0330*** (-5.5321)	-0.0087** (-1.9342)
QFII <sup>2</sup>	0.0089*** (28.0013)	0.0069*** (19.1297)	0.0071*** (15.5008)	0.0046*** (12.3091)
Dinst		-0.0025*** (-7.2582)		-0.0005* (-1.4764)
Ln (P)		-0.3298*** (-50.9491)		-0.3331*** (-35.8138)
Ln (Size)				
Ln (Analysts)		0.1541*** (26.2590)		0.1366*** (18.6564)
Ln (Turnover)		-0.3677*** (-38.4448)		-0.3655*** (-58.9815)
Ln (Volume)				
First1			0.0003*** (6.0524)	0.0024*** (6.3183)
First10			0.0004*** (1.0389)	-0.0079*** (-12.8892)
Ln (Lev)			0.2232*** (33.0975)	0.0722*** (7.1061)
PE			-0.0002*** (-7.2783)	-0.00002*** (-2.8578)
C	-1.2026*** (-44.7913)	1.1725*** (18.8949)	-2.1702*** (-55.0513)	1.2026*** (15.3501)
R <sup>2</sup>	0.2797	0.9510	0.6726	0.9912
N	2056	1825	2035	1805

Note: The values in () are t-value statistics, in which “\*, \*\*, \*\*\*” represent significant levels of 10 percent, 5 percent and 1 percent respectively.

Through the whole sample regression analysis and the sub-economic cycle regression analysis, we can infer that the critical value of the impact of foreign institutional investors on the information efficiency of China’s stock market is about 4 percent.



## Regression of Different Enterprises

Among the listed companies in China, state-owned enterprises account for a higher proportion of financing. And the proportion of private and foreign-funded enterprises is much lower. There are significant differences of different enterprises in China in terms of operation and profitability. Considering the difference between state-owned enterprises and private enterprises, their regression results are compared in this group. The regression results of Table 6 and Table 7 show that the QFII regression results of column (1) in the regression of state-owned enterprises are not significant. The QFII regression in column (3) is not significant. In the regression of private enterprise group, the regression coefficient of QFII is negative, and the regression results are significant. This result shows that the key problem in the development of China's capital markets is state-owned enterprises, which play an important role because of their large scale. Based on the analysis of regression results, it can be concluded that QFII have no significant impact on the information efficiency of state-owned enterprises, which may be due to the large scale of state-owned enterprises and the low proportion of QFII's investments in state-owned enterprises. Why is the proportion of QFII's allocation in state-owned enterprises so low? Research has found this is because of the persistent institutional problems existing in the state-owned enterprises themselves and the fact that there are many non-market factors hindering the operation of the state-owned enterprises in China. The results of this regression may provide a reference supporting the construction of capital markets in China from the perspective of the reform of state-owned enterprises.

Table 6 EGLS Regression of Samples of State-owned Enterprises

	Synchronicity			
	(1)	(2)	(3)	(4)
QFII	-0.0034 (-0.1786)	-0.0592*** (-3.4172)	-0.0056 (-0.6066)	-0.0451*** (-2.8789)
QFII <sup>2</sup>	0.0043*** (2.4563)	0.0064*** (3.8492)	0.0038*** (3.0983)	0.0045*** (3.1019)
Dinst		-0.0052*** (-6.3960)		-0.0044*** (-4.9644)
Ln (Size)		0.1247*** (8.9235)		0.1454*** (14.8486)
Ln (Analysts)		0.0023 (0.1455)		0.0126 (1.1821)
Ln (Turnover)		-0.2619*** (-20.3315)		-0.2402*** (-28.4823)
First1			-0.0015	-0.0027***

	Synchronicity			
	(1)	(2)	(3)	(4)
			(-1.3146)	(-2.8206)
First10			0.0081***	-0.00002
			(5.7509)	(-0.2831)
Ln (Lev)			0.1010***	0.0372*
			(5.5817)	(1.7589)
PE			7.5765	-0.0004***
			(0.5856)	(-5.3224)
C	-0.9587***	-1.2204***	-1.7738***	-1.6899***
	(-48.8346)	(-5.7524)	(-18.7590)	(-10.5291)
R <sup>2</sup>	0.1318	0.4842	0.8667	0.8264
N	1643	1457	1621	1436

Note: The values in the regression list () are t values, in which “\*, \*\*, \*\*\*” represent significant levels of 10 percent, 5 percent and 1 percent respectively.

The regression results of QFII<sup>2</sup> indicate that there is an inverted U-shaped law in both state-owned and private enterprises in China. And it is significant at the 1 percent significance level.

Table 7 EGLS Regression of Private Enterprise Samples

	Synchronicity			
	(1)	(2)	(3)	(4)
QFII	-0.0342***	-0.0290***	-0.0139*	-0.0176*
	(-7.1939)	(-2.0579)	(-1.6535)	(-1.6066)
QFII <sup>2</sup>	0.0056***	0.0063***	0.0043***	0.0052***
	(5.4446)	(6.3061)	(4.0639)	(5.5542)
Dinst		-0.0078***		-0.0085***
		(-18.7847)		(-17.11)
Ln (Size)		0.2371***		0.2403***
		(27.7055)		(28.1035)
Ln (Analysts)		-0.1344***		-0.1274***
		(-7.9252)		(-7.9225)
Ln (Turnover)		-0.1915***		-0.1947***
		(-14.5675)		(-11.8886)
First1			0.0043***	0.0040***
			(15.3052)	(4.4953)
First10			-0.0048***	-0.0023**
			(-11.7716)	(-2.4852)
Ln(Lev)			0.0927***	-0.0382***
			-19.5932	(-3.5141)
PE			-8.5343***	-9.2556

	Synchronicity			
	(1)	(2)	(3)	(4)
C	-1.5433*** (-38.6500)	-3.1015*** (-27.4374)	(-5.0575) -1.7326*** (-40.5100)	(-0.7795) -2.9877*** (-17.3786)
R <sup>2</sup>	0.5166	0.5870	0.4650	0.8475
N	1366	1199	1360	1193

Note: The values in () are t-value statistics, in which “\*, \*\*, \*\*\*” represent significant levels of 10 percent, 5 percent and 1 percent respectively.

Compared with private enterprises, the market value of state-owned enterprises is larger, and they gain more attention in social life. Logically, the information efficiency of state-owned enterprises should be higher. However, the empirical results show that the impact of foreign institutional investors on the information efficiency of state-owned enterprises is not significant. It is unstable. Therefore, Hypothesis 4b can be verified.

### Classified Regression Based on Different Levels of the Markets

China’s regulators are committed to establishing multi-level capital markets to better provide financial services for enterprises at different levels. There are three sectors in Chinese stock market, namely, main board market, small and medium-sized board market, and GEM market in China. We divided the listed companies according to their different levels in the capital markets and carried out empirical research accordingly.

Table 8 EGLS Regression of Main Board Samples

	Synchronicity			
	(1)	(2)	(3)	(4)
QFII	-0.0162* (-1.6147)	-0.04176*** (-8.8487)	-0.0101 (-1.3514)	-0.0351*** (-3.7152)
QFII <sup>2</sup>	0.0058*** (7.4434)	0.0057*** (9.6301)	0.0052*** (8.14630)	0.0048*** (6.1151)
Dinst		-0.0053*** (-40.5186)		-0.0051*** (-7.8226)
Ln (Size)		0.1981*** (39.7093)		0.1749*** (20.9345)
Ln (Analysts)		-0.0477*** (-12.0072)		-0.03673*** (-5.1535)
Ln (Turnover)		-0.1992*** (-32.6461)		-0.2144*** (-25.2886)
First1			0.0017** (2.2796)	-0.0011* (-1.8366)
First10			0.0046*** (5.1535)	-0.0001 (-0.2048)

	Synchronicity			
	(1)	(2)	(3)	(4)
Ln (Lev)			0.1495*** (9.2547)	0.1174*** (6.4337)
PE			3.3012 (0.3106)	-0.0002* (-1.6968)
C	-1.0408 (-11.9816)		-1.9471*** (-28.5078)	-2.5291*** (-22.3928)
R <sup>2</sup>	0.1806		0.2062	0.6518
N	2197		2162	1928

Note: The values in () are t-value statistics, in which “\*, \*\*, \*\*\*” represent significant levels of 10 percent, 5 percent and 1 percent respectively.

The empirical results in tables 8 and 9 show that the effect of QFII on price synchronization is unstable in the main board market. In (1), the coefficient of QFII is negative, but the significance is not high. In (3), the coefficient of QFII is positive, but it is not significant at all. Only in columns (2) and (4) are the results significant. This indicates that QFII have an unstable influence on the information efficiency of the stocks in the main board market. In Table 6-11, through the investigation of small and medium-sized venture market, empirical research verifies that the QFII coefficient is negative and significant. QFII have a very stable role in promoting the information efficiency of the stocks in small and medium-sized venture market. The empirical results further verify Hypothesis 4b.

In the regression of  $QFII^2$ , we find that the impact of QFII on stock information efficiency is non-linear and has an inverted U-shaped characteristic, whether in the main board market or small and medium-sized venture market. In this regard, our empirical study is highly consistent with previous studies, which indicates that introducing QFII in China can indeed improve the information efficiency of the stock market. But its promotion has a certain threshold effect. When the investment scale of QFII exceeds a certain threshold value, it will play a restraining role on stock information efficiency.

Table 9 EGLS Regression of Small and Medium-sized Venture Market Samples

	Synchronicity			
	(1)	(2)	(3)	(4)
QFII	-0.0488*** (-8.6326)	-0.0284*** (-3.1301)	-0.0442*** (-3.9324)	-0.0284** (-2.0987)
$QFII^2$	0.0098*** (26.7990)	0.0077*** (13.2739)	0.0094*** (14.4716)	0.0075*** (8.8479)
Dinst		-0.0081*** (-16.0028)		-0.0091*** (-16.0952)
Ln (Size)		0.1870*** (21.6477)		0.2113*** (21.7165)

	Synchronicity			
	(1)	(2)	(3)	(4)
Ln (Analysts)		-0.0784*** (-11.1096)		-0.1101*** (-7.1590)
Ln (Turnover)		-0.2116*** (-21.2381)		-0.2283*** (-13.5693)
First1			0.0016* (1.4869)	0.0005 (0.5426)
First10			-0.0046*** (-4.7162)	0.0027** (2.3620)
Ln (Lev)			0.0695*** (5.2773)	-0.0326* (-1.9457)
PE			-1.6234 (-0.030)	-0.0001 (-1.2568)
C	-1.6059*** (-16.5671)	-2.5401*** (-23.4599)	-1.5882*** (-23.7066)	-2.7217*** (-14.7263)
R <sup>2</sup>	0.6917	0.6092	0.8776	0.7810
N	1196	1050	1196	1050

Note: The values in () are t-value statistics, in which “\*, \*\*, \*\*\*” represent significant levels of 10 percent, 5 percent and 1 percent respectively.

Based on the nature of enterprises and the classification and regression of listed companies, the empirical tests show that QFII’s investments in non-state-owned enterprises and listed companies in non-main board market can reduce the synchronization of stock prices. This indicates that these types of enterprises have greater heterogeneity. Rational professional institutional investors are needed to make investment choices to ensure the survival of the market.

### Robustness Test and Endogeneity Test

According to previous research, stock price synchronization is based on  $R^2$  transformation. The index of stock price synchronization reflects the specific information content of stock, and it is a method to measure information efficiency. According to the research of Hou and Moskowitz (2005), we can construct a delay index, which is used to measure the reaction speed of stock price to information. The larger the index, the more contribution the historical information makes to the current stock price. The smaller the index is, the more the current information contributes to the stock price. The difference between delay and synchronicity is that the synchronicity of a stock price reflects the indifferent property of stocks rising and falling together. Delay reflects the reaction speed of stock prices to current market returns. The better the current market rate of return reflects the individual stock rate of return, the faster the stock responds to information. By regressing the markets returns with and without lags, we construct the delay by using the  $R^2$  of different regression results. The smaller the delay value, the lower the dependence of stock returns

on historical market information, and the shorter the time it takes for stock prices to absorb market information, thus the higher the information efficiency. We used “delay” to replace the interpreted variable “synchronicity” and used the mixed cross-sectional stock data to test whether the regression results were consistent to judge the robustness of the logical relationship.

Table 10 is a regression test based on the whole sample. The interpreted variables are replaced by delay. By comparing Table 10 with Table 3, we found that QFII have a negative effect on delay in the regression of Table 10, and both are very significant. This shows that QFII’s investments reduce the delay and improve the information efficiency of the stock market. In delay’s regression of QFII square terms, the coefficients of QFII<sup>2</sup> terms are all positive, and the significance level is very significant. This indicates that the relationship between delay and QFII is not monotonous decreasing, but non-linear. When QFII’s investments increase to a certain proportion, the investment of QFII will increase delay, and the information efficiency will change from increasing to decreasing. The regression results are consistent with Table 3 after using a price hysteresis index (delay), which further verifies Hypothesis 1 and Hypothesis 2.

Table 10 Robustness Test Based on Mixed Section Data (EGLS)

	Delay			
	(1)	(2)	(3)	(4)
QFII	-0.01906*** (-2.8831)	-0.0511*** (-10.9875)	-0.0107* (-1.5720)	-0.0243*** (-26.6791)
QFII <sup>2</sup>	0.0019*** (4.3944)	0.0033*** (9.4917)	0.0079* (1.7210)	0.0090*** (12.7145)
Dinst	-0.0011** (-2.4576)		-0.0081** (-2.4321)	-0.0015** (-2.3215)
Ln (P)	-0.2729** (-2.0020)			
Ln (Size)	0.1711 (1.2647)		0.2247*** (3.8117)	
Ln (Analysts)	0.1403*** (11.0934)		0.04497 (0.5873)	
Ln (Turnover)	-0.3033** (-2.2505)		-0.1546* (-1.8650)	
Ln (Volume)	0.1186 (0.8788)			
First1	0.0067*** (12.2933)			0.0275*** (24.0939)
First10	-0.0157*** (-25.3269)			-0.03022*** (-26.4038)
Ln (Lev)	-0.1478*** (-9.3379)			-0.0287 (-1.4628)
PE	-0.0001			1.0523***



	Delay			
	(1)	(2)	(3)	(4)
	(-1.1253)			(2.6114)
C	-2.5602***		-2.8192***	-0.6035***
	(-4.0807)		(-2.8327)	(-6.7045)
R <sup>2</sup>	0.7745	0.2002	0.1492	0.6732
N	2978	3933	3012	3358

Note: The values in ( ) are t-value statistics, in which “\*, \*\*, \*\*\*” represent the significant levels of 10 percent, 5 percent and 1 percent respectively.

### Endogeneity Test

When investing, QFII may choose efficient industries according to the information efficiency of past stock market. The industries invested by QFII are the industries with high pricing efficiency. Foreign institutional investors prefer stocks with high transparency and information content when choosing investment targets. This may lead to endogenous problems. To overcome this endogenous problem, we used the method of metrology (Woodridge, 2006) lagged QFII’s data. We used QFII’s investments with lag periods as instrumental variables to deal with endogenous problems, and obtained consistent estimators by the two-stage least squares method. In the mixed cross-section data, we lagged the key explanatory variables for one period as instrumental variables. Using two-stage least squares method, the regression results are consistent with the previous results of non-equilibrium panel data, indicating that the model is not endogenous, and that the specific regression results are similar to the regression results of balanced panel data. Due to the limited space, the process is not detailed here.

### Research Conclusion

Based on the perspective of information content and information response, this paper empirically examines the relationship between foreign institutional investors and information efficiency in China’s stock market by using QFII’s investment data. The results indicate that foreign institutional investors can reduce the synchronization of China’s stock prices and improve the information efficiency of the stock market. However, there is a non-linear relationship between foreign institutional investors and information efficiency due to adverse selection, foreign institutional investors’ concerns, and the policy risks of China’s capital markets. Empirical research shows that the impact of foreign institutional investors on the information efficiency of China’s stock market is more significant in bear markets than in bull markets, and more significant in private enterprises of SME market than in state-owned enterprises of main board market. The conclusions of this study are expected to provide enlightenment for efficiency improvements in China’s capital markets.

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(Editor: Xu Huilan)

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Include an abstract of no more than 250 words, typed on a separate page. After the abstract, please supply up to five keywords or brief phrases. Provide personal information for each author (name, position and title, degree, postal address including postcode, phone number and e-mail address).

Papers should be approximately 10,000 words including notes and references.

If you do not receive a notice of acceptance within three months after submission, feel free to submit your paper to other journals.

Our editorial department reserves the right to make corrections or deletions to manuscripts. Any such changes will be reported to you for your approval. If you do not agree with this policy, please clearly state so in your submission.

Please secure copyright independence for your submission and ensure there is no academic misconduct, like plagiarism, no dispute about the order of authors' names, and be responsible for the content of your manuscript.

### Address:

No. 155, West 1st Section of First Ring Road, Qingyang District, Chengdu, Sichuan Province, China.  
Postcode: 610072  
China  
Tel: (0086)-28-61352442

### Address Electronic Submissions to

Political Science, Sociology, Philosophy: [css1639\\_xw@163.com](mailto:css1639_xw@163.com)

Economics, Management: [css1639\\_em@163.com](mailto:css1639_em@163.com)

Literature, History: [css1639\\_yg@163.com](mailto:css1639_yg@163.com)

Journalism and Communication, Education, Linguistics: [css1639\\_yyt@163.com](mailto:css1639_yyt@163.com)

Law, Interdisciplinary research, Others: [css1639\\_yyz@163.com](mailto:css1639_yyz@163.com)

## A Brief Introduction to Sichuan Academy of Social Sciences

Sichuan Academy of Social Sciences is the think tank for the People's Government of Sichuan Province and the Sichuan Provincial Committee of the CPC, with full financial backing of the Party and the government. The Academy consists of 15 institutes, 1 graduate school, 10 departments of scientific research management services and 17 branches. At the end of 2015 the staff numbered 1,200, including 710 employees with full financial allocation (459 on-the-job employees and 265 retired employees), and 405 master graduate students. Among the scientific research personnel, 62 employees have senior professional titles, and 125 employees have associate senior professional titles; 19 employees are experts entitled to special allowances of the State Council, 21 employees are provincial academic and technical leaders, 16 employees are experts with outstanding contributions at provincial level; and 115 employees have doctorate degrees. The publications sponsored by the Academy are 9 magazines and 1 newspaper, namely *Social Science Research*, *Mao Zedong Thought Study*, *Deng Xiaoping Research*, *Reform of Economic System*, *Rural Economy*, *Forum on Chinese Culture*, *Western China*, *Contemporary County Economy*, *Contemporary Social Sciences (English)*, and *Entrepreneur Daily*; three websites are hosted (namely the portal website of provincial philosophy and social sciences-Sichuan Social Sciences online, website of the Academy-Tianfu Think Tank, English website). With abundant literature information resources, Sichuan Academy of Social Sciences has a collection of 720,000 books, and over 2,000 kinds of Chinese and foreign periodicals. Besides its own database resources, the Academy has access to a variety of academic databases, including China National Knowledge Infrastructure, SOSHOO, Zhonghongwang.com, Duxiu.com, Chaoxing.com, National Social Sciences Database, Communist Party of China's political and theoretical resources database, Dachengdata.com, and DRCnet.com.cn. It has 8 provincial key disciplines and 11 excellent disciplines, 5 first-level disciplines and 44 graduate degree programs of second-level disciplines, 1 joint PhD program, and 1 national post-doctoral research station.

Under the guidance and support of the leadership of the provincial party committee and government, Sichuan Academy of Social Sciences will adhere to the theoretical system of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era as a guide for scientific research work and completion of its main objective: to accelerate the construction of a strong theoretical position, a high-end decision-making think tank, a first-class academic institution and an important base for popularization of science. Its comprehensive strength in local academies of social sciences is among the best nationwide.