

# Analysis and Improvement of Intellectual Property Protection Strength Index in China

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## Abstract

*The intellectual property protection strength index (IPPS) invented by developed countries researchers mainly measures the legislative protection level of intellectual property in a country. As TRIPS Agreement is widely accepted, the intellectual protection legislation tends to be assimilated worldwide and this index is difficult to distinguish the difference between the intellectual protection levels of developing and developed countries. This article introduces some amendment visions to IPPS which Chinese scholars made. In these indexes increased the measure of the intellectual property enforcement level, so that the IPPS became a synthesis of legislative protection strength index and law enforcement strength protection index. The article claims that these new indexes has good development prospect, but there are many inconsistencies in the definition of sub-items in intellectual property enforcement strength index. So it is required to further improve the Chinese IPPS index system, faithfully evaluate the performance of intellectual property protection combined with China's economic and social development level, national and local legal status, cultural background and other factors.*

**Keywords:** *China, index, enforcement*

## 1. Introduction

The intellectual property right is a world-wide general norm and the legal scope protecting intelligent behavior and its achievements. The intellectual property and its legal norms have relatively short history, but their “globalization” speed is very fast. The intellectual property law in today’s world has highest level of similarity with the typical performance that the countries belonging to different legal systems basically subdivide the intellectual property into copyright, patent, trademark and some emerging rights. Most countries build highly consistent intellectual property gaining method, rights protection term, participation of interests, infringement review and other systems. Therefore, it is possible to compare the static intellectual property legal system and dynamic intellectual property protection status of each country. In the intellectual property protection analysis tools developed by the researchers, the intellectual property protection strength index (IPPS) has high degree of consensus.

## 2. The Content and Limitation of IPPS Index

The IPPS index was born in the 1990s. Ginarte and Park designed five primary branches of IPPS indexes, namely, extent of coverage, membership in international patent agreements, provisions for loss of protection, enforcement mechanisms and duration of protection. Each primary index was divided into several secondary indexes [1]. The score of primary indexes is 0-1 and the score of the secondary indexes is obtained by simple arithmetic mean [2]. That is, the number of the

secondary indexes that can be scored is divided by the total number of indexes and then the scores of all primary indexes are added to obtain the intellectual property protection strength score of a country. In 2008, Professor Park slightly amended Ginart- Park indexes and increased several indexes [3], as shown in Table 1.

**Table 1. List of Ginarte-Park Intellectual Property Protection Strength Indexes**

Primary index	Secondary index	Scoring method	Remark
Extent of coverage	Pharmaceuticals	Each secondary index is scored as 1/8. This index type, if listed as patented object by the patent law of the investigated country, can be scored and added as the primary index score.	Software patent index was added in 2008 by Professor Park
	Chemicals		
	Foods		
	Plant and animal varieties		
	Surgical products		
	Microorganisms		
	Utility models		
	Software		
Membership in international patent agreements	Paris Convention	Each secondary index is scored as 1/5. The indexes can be scored and added as the primary index score if the investigated country is approved to join or is admitted to be a member in international agreements.	Budapest Treaty and TRIPS Agreement were added in 2008 By Professor Park
	Patent Cooperation Treaty		
	International Convention for the Protection of New Varieties of Plants		
	Budapest Treaty		
	TRIPS Agreement		
Provisions for loss of protection	Implementing requirements	Each secondary index is scored as 1/3. The indexes can be scored and added as the primary index score if the investigated country has implementation requirements for the patent, stipulates the patent compulsory license system and can revoke the granted patents.	
	Compulsory licensing		
	Revocation of patents		
Enforcement mechanisms	Preliminary injunctions	Each secondary index is scored as 1/3. The indexes can be scored and added as the primary index score if the patent law of the investigated country allows the obligee to apply for preliminary injunctions, stipulates the joint liability for the patent damages and takes the burden-of-proof reversals in the patent lawsuit.	
	Joint liability		
	Burden-of-proof reversals		
Duration of protection	Invention patent protection duration	The scoring method is to divide the invention patent protection duration (year) stipulated in the patent law of the investigated country by 20. The quotient is the primary index score. If the quotient is greater than 1 (that is, the invention patent protection duration is longer than 20 years), the score is 1.	

As for Chinese intellectual property protection strength measured by this index, in above index options, the plant and animal varieties and software are not patented and revocation of patents is not available in China under current patent law, so such three items cannot be scored and total score of China is 4.42 [4].

However, the limitations of this index are that: (1) It cannot accurately reflect a country's law enforcement efforts to protect the intellectual property rights [5]; in particular, it cannot be seen from the "provisions for loss of protection" and "enforcement mechanisms" whether the position orientation of a country's law enforcement department is strict and whether the enforcement frequency is duteous in the treatment of intellectual property rights disputes.

(2) The discrimination of indexes is not satisfactory [6]. The most typical example is that Chinese researchers compared the intellectual property protection in China and foreign countries according to this set of indexes. [7]

(3) The index timeliness is weak. If a country's patent law remains stable after previous modification or the patent law modification content is not related to patent protection coverage, patent licensing and patent infringement attribution principle and is not added to new international intellectual property agreements, the country's intellectual property protection strength is constant. [8]

### 3 Chinese Researchers' Improvements for IPPS Index

Chinese researchers have conducted various explorations. They added the intellectual property enforcement strength index and combined into a complete intellectual property protection strength index system on the basis of Ginart-Park index system according to the perception of the intellectual property protection characteristics of other countries rather than research and develop the index system independently. There are "four-index enforcement strength system" proposed by Han and Li [9], "five-index system" proposed by Xu and Shan [10] and "three-index system" proposed by Shen and Liu[11]. The specific measurement is based on Table 2, in which, the arithmetic mean value of the sub-item index score is China's intellectual property enforcement strength index.

**Table 2. List of Intellectual Property Enforcement Protection Strength Indexes Built by Chinese Scholars**

Inventor	Index name	Measurement basis	Scoring method
Y.X.Han , H.Z.Li	Social legislation degree	proportion of lawyers in total population	The proportion is divided by 0.05% and the maximum value does not exceed 1
	Completeness degree of legal system	legislation time	The legislation time actually experienced by a country is divided by 100 and the maximum value does not exceed 1. (China's legislation time is calculated from 1954)
	Economic development level	per capita GDP	China's per capita GDP is divided by 1000USD and the maximum value does not exceed 1
	Supervision and balance mechanism of international community	whether a WTO member	The score was 0.066 every year from GATT negotiation of China in 1986 to accession to WTO (2001)
C.M.Xu, X.G.Shan	Juridical protection level	Proportion of lawyers in total population	Ditto
	Administrative protection level	Legislation time	Ditto
	Economic development level	Per capita GDP	China's per capita GDP is divided by 2000USD and the maximum value does not exceed 1
	Public awareness	Adult literacy rate	The actual rate of the index is divided by 95% and the maximum value does not exceed 1
	International control	Whether a WTO member	The score was 0.05 every year from GATT negotiation of China in 1986 to fifth year after accession to WTO (2005)
G.B.Shen, J.Liu	Economic development level	Per capita GDP	Quotient of China's per capita GNI to LMI upper limit reference issued by the World Bank
	Level of rule of law	Report of the World Bank on China's level of rule of law	Score of China's level of rule of law/ score of East Asia's level of rule of law
	Intellectual property enforcement level	Patent infringement protection level and	The former is the proportion of number of concluded patent

		enforcing mechanism protection level	infringement cases in total number of concluded patent cases and the latter is the investigation or conclusion rate of civil intellectual property cases of customs or courts.
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With the control rod of data between 1995 and 2004, the calculation result of Han and Li fell between 0.44 and 0.68, of Xu and Shan was 0.445-0.657, of Shen and Liu was 0.605-0.717 [12]. These parameters are multiplied by Ginarte-Park strength index to obtain China's IPPS index, as shown in Table 3.

**Table 3: List of Intellectual Property Legislation Strength – Enforcement Strength Indexes Measured by Chinese Researchers**

Inventor	Year	Year	Year
	1995	2001	2005
Y.X.Han , H.Z.Li	1.33	2.79	4.53
C.M.Xu, X.G.Shan	1.419	2.209	2.536
G.B.Shen, J.Liu	1.83	2.79	3.40

The IPPS indexes system amended by Chinese scholars is more comprehensive than before, but its limitations are still reflected in following:

(1) It still characterizes the intellectual property protection level simply by patent without absorbing trademark, copyright, trade secrets and new intellectual property types.

There is no doubt that the patent is an intellectual property index with most industrial prospects and economic value currently and the amount involved in patent disputes occupies most of the economic benefits reflected by the intellectual property protection, but there are two shortcomings: firstly, in terms of data, China is far from being a patent power at now time. In the patents filled and authorized by Chinese enterprises and natural persons, the ratio of the invention patents is lowest and long hovers below 20%, while the ratio of utility models and design patents is high [13]. Secondly, the disputes involving trademark and electronic product copyright are increasing, such as the "IPAD" trademark dispute between U.S. Apple Company and China Proview Company [14]. These types of intellectual property disputes will break out centrally in the coming period, so it is essential to monitor the intellectual property protection level of these legal activities related to intellectual property.

(2)The dichotomy-type intellectual property protection index system design of legislation strength and enforcement strength has formed a breakthrough compared with before, but it is difficult to reflect the institutional characteristics and legal characteristics of the intellectual property in terms of screening of some indexes. In terms of legislation index: firstly, only the modification of the patent law itself is concerned, while a large number of legal norms on patent granting, licensing and infringement matters in China exist in the form of administrative regulations and rules. Secondly, observation of "provisions for loss of protection" and "enforcement mechanisms" from the perspective of legislation will cause some bias. Take revocation of patents for example. China's first patent law in 1984 did not stipulate revocation of patents, which was increased in the first revision of patent law in 1992 and cancelled in the second revision in 2000 and not involved in the third revision in 2008. Therefore, China's intellectual property legislation strength cannot be scored in this regard, but what problem can be indicated from this score? The supporters may think that the former right of claim of the obligee is weakened due to non-availability of patent revocation system, but the opposers may cite the request system for announcement of patent invalidation in the patent law to confirm

that it is more superior to the patent revocation system. Another example is the “patent ban”, which was increased in the revision of patent law in 2000 [16]. When tracing the background and principles of this revision, many researchers believed that this system, together with the trade negotiations between the U.S. and China as well as the “leap forward” revision of China to respond to WTO accession requirements and to achieve the obligations stipulated in TRIPS Agreement, has greatly enhanced the legislation speed of China’s intellectual property field, exceeded the minimum protection standard determined in TRIPS Agreement in some aspects and formed the situation of protection “beyond world level”. More unfortunately, due to inadequate preparation of legislation, inconsistent preliminary injunction review scales of patent in various regions, over view and other problems exist in practice. It seems at present that it is debatable to take patent ban as a representative index of China’s intellectual property protection.

In terms of enforcement index, the index designers focused on the statistical data availability, but ignored the accuracy and explanatory power of index selection. On the whole, it is understandable to summarize the “social legislation degree” with the “proportion of lawyers in total population” and to describe the “economic development level” with “per capita GDP or GNP”, but it deviates from the purpose of intellectual property protection strength research to refer to specific “social consciousness” and “international intellectual property obligations” with “adult literacy rate” and “membership in WTO”. On the one hand, with less volatility, the “adult literacy rate” index affects the statistical difference; on the other hand, the “membership in WTO” belongs to dichotomous variable –but is rigidly transformed into a continuous variable, making it impossible to have some fluctuation in the statistical result curve, but showing an artificial “smooth” trend. The most worth considering is the “completeness degree of the country’s legal system”. The basic assumption made by researchers neither applies to the intellectual property law which mainly generated by law transplanted, nor applies to China’s national condition.

(3) Several types of index systems mainly reflect the domestic intellectual property protection status and do not obviously reflect the cross-border intellectual property protection information. The developed countries investigated the legal liabilities of Chinese enterprises for intellectual property by means of Section 301, Section 337, intellectual property attachment of customs transit and interim attachment of international exhibition [17]. Foreign intellectual property enforcement initiated for Chinese enterprises can reflect China’s intellectual property protection strength from another side, that is, the increased foreign intellectual property disputes indicate that there are many passive factors in the country’s intellectual property protection; on the contrary, the decreased foreign intellectual property disputes indicate that the country’s intellectual property (publicity) protection is positive.

On the whole, although China’s intellectual property protection strength measured by above index system is lower than that measured by simply using Ginarte-Park method, this “lower” does not mean that the explanatory power for China’s intellectual property protection performance is more appropriate. If an index system can only display the progress of the statistical objects in the life cycle rather than well display some degree of stagnation, callback and even retroversion, the confidence coefficient of such unilateral index is not adequate enough.

#### **4. Suggestion to the Design of Chinese IPPS Index**

The intellectual property protection strength index with Chinese characteristics shall be constructed in two steps. First, follow the existing intellectual property protection strength index system, replace some observational items, absorb new standards and rationally allocate the weights of various variables. Second, construct complete intellectual property protection strength indexes according to patent, trademark, copyright and other intellectual property rights systems and integrate the legislation and enforcement activities to form the integrated intellectual property strength protection index. The first step, namely, updating the existing protection strength index system is mainly elaborated here.

#### **4.1 Understand the Metaphor of “Strength”**

The intellectual property is a private right. In the intellectual property protection process, the first reaction chain shall be self-reliant action of the right subjects, and the role of the public power shall promptly follow up, provide support, and conduct entity confirmation and program specification for important rights facts. prevent and relieve the highly frequent intellectual property risks. Therefore, intellectual property protection and strength is a unity for the government and the people, its feedback results shall not be simply understood as an official action. In contrast, most of the existing intellectual property protection strength indexes have the records and assessment with particular stress on official protection and ignore the civil progress on intellectual property awareness and protection. Meanwhile, not merely the civil law and commercial law carry out protection for intellectual property. The number and influence of intellectual property criminal case trials is increasing in recent years, requiring us to consider the rule of law integration and not to be limited to the civil law protection when understanding the intellectual property protection strength.

#### **4.2 Replace the Existing Intellectual Property Protection Index System and Incorporate More Information**

First, focus on retaining “extent of coverage” and “duration of protection” and adjust their scoring methods. In the “extent of coverage”, use a variable of patent law update speed, set the government patent law on the starting year of statistics as 1, review the introduction, revision and abolishment of the patent law in the observed year, divide above two values or multiply by a predetermined coefficient to obtain the statistical value. In the “duration of protection”, collect the number of patents remaining valid and the patent application quantity in the regions or years subject to statistics for proportional treatment to reflect the actual impact of the patent law on patent holding and obtaining rather than nominal time impact. Second, since China’s accession to or participation in international agreements has stable political and legal considerations and the index of “membership in international agreements” changes slightly, and is essentially meaningless for inter-provincial comparison, this index is suggested to be set as an optional item, ignored in inter-provincial comparison and used in overall national comparison. But the observation object shall be enriched, the bilateral intellectual property agreements signed between China and the commercial fellows, treaty negotiation and revision submitted to specialized international organizations by China is considered as the statistical variable. Third, transfer the “provisions for loss of protection” and “enforcement mechanisms” to the intellectual property enforcement index system.

The intellectual property enforcement protection strength has low degree of research consensus currently. Therefore, the suggestions made by the author are more at the evidence level [18]. First, whether it is required to link the intellectual property enforcement protection strength with economic development. Certain historical period of economy indeed touch the active degree of intellectual property

control. For example, the well-known international trade friction tends to rise in the global economic downturn. The demand and pulling effect of economic development is also taken into account in the course of intellectual property legislation, but which index is used to reveal the precise correlation between the two is to be further explored. In the study of economics, GDP is the “classic” variable with extraordinary explanatory power, but precisely on the relationship between the intellectual property protection and the economic development, the international academic community has not formed a unified view so far. The skeptics even proposed that strict intellectual property control would hinder the country’s economic growth in a particular period. R&D expenditure or technical trade volume can be used to fill GDP which is not used. Second, the variable of the “completeness degree of legal system” and “social public awareness” have been elaborated earlier. We recommend replacing legislation time, adult literacy rate and other abstract values with approved “Intellectual property court quantity”, “quantity of judges engaged in intellectual property judgment”, “quantity of patent agents”, “quantity of intellectual property aid cases” and other more specific indexes. Third, we recommend directly converting the indexes of “juridical protection level” and “international community supervision” into the “comparison of average compensation amount of judicial intellectual property cases”, “quantity of invalid applications accepted by the patent reexamination board and conviction and sentencing extent of criminal intellectual property cases”, as well as “the number of registered customs intellectual property cases” and the “conclusion rate of civil intellectual property cases” for preliminary performance evaluation. Fourth, consider increasing “intellectual property enforcement satisfaction index” and collecting the opinions of the intellectual property obliges, business partners, consumers and intermediaries and consider drawing on various law rule indexes published in other researches in case of inconveniently direct access to such indexes or limited research costs.

## 5. Conclusion

Designing a set of intellectual property protection strength index systems unlike previous model shall be faced with reliability and validity, predictive power, universality and other aspects. The article is required to provide enlightening suggestions and clues. In the long run, we should focus on the applied range and reference value of the IPPS index. We design and monitor such an index to hope that it can view the overall performance of the intellectual property protection and can provide scale for concrete intellectual property enforcement activities; that it can compare between nations and panel data and can compare the intellectual property protection status in all provinces and cities in China and even in more microscopic geological scope; that it is of both academic significance and political significance. However, due to the limitations of index system sample sources, data acquisition and statistical accuracy, the explanatory power of any index can only stay in a certain limit of statistical assumptions. Therefore, the complexity of intellectual property strength protection index and accuracy of self-consistency between indexes cannot completely avoid a certain degree of bias. In view of the internal and external situation of China’s intellectual property career, we advise that the intellectual property protection strength index is mainly used to analyze the domestic intellectual property status and compare the cross-section data (such as the data of different regions in the same period) and is cautiously used to compare the intellectual property protection between countries and carry out domestic intellectual property protection ranking activities.).

## ACKNOWLEDGEMENTS

This paper was Sponsored by K.C.Wong Magna Fund in Ningbo University and Science Technology Department of Zhejiang Province.

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