
Chapter One: General Rankings, Research Findings, and In-Depth Analysis of the 2018 China Intellectual Property Rights Index Report

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As indicated by the World Bank Report, the already burdened international trade environment could be further exacerbated by the aggravating and negative impacts of rounds of unpredictable trade talks and negotiations among major global economic powers, compounded by the ever-increasing risk of escalating trade restriction measures. Meanwhile, with China's continuous growth in the area of advanced technology, many of China's advance technology is at an equal footing with leading countries around the world, with some fields even leading the international industry. With a more concrete emphasize on independent research and self-development, China's policy approach of technological development in the foreseeable future should be based on a combination of both "open cooperation" and "self-reliance."

The overall significance of intellectual property thus becomes more apparent contrasting with such a complicated international background. In April 2018, as stressed by President Xi, Jinping in his keynote speech in the opening ceremony of the 2018 Annual Session of Boao Forum of Asia, "Strengthen the protection of intellectual property...is a key component of constructing a more comprehensive IP protection system. It is also one of the major stimulating factors enhancing China's economic competitiveness. As such, the demand for such protection come from not only foreign entities investing in China, but also domestic Chinese companies in general." (As President Xi) also points out, "(the Chinese government) plans to restructure the

National Intellectual Property Administration, PRC¹, which will in turn strengthen legal enforcement of intellectual property protection, increase the extent of enforcement, significantly raise the cost of IP infringement, and in doing so accomplish the purpose of legal deterrence (of IP infringement).”

(It is thus foreseeable that) the industry of Intellectual Property will usher in one of the best periods of development, and it is destined to undertake a greater responsibility in the socio-economic development of China. One crucial element in the area of intellectual property development is the construction of a favorable environment, which can be achieved via introducing friendlier innovative entrepreneurship environment, an improved business operating environment, and a healthier ecological environment. Within the 2018 edition of the Intellectual Property Index Report, we included indexes measuring both business operating environment and ecological environment, the purpose of which is to evaluate (with empirical data) the developmental status of both environments within the various provinces of China and understanding the effect of such status with respect to the development of intellectual property.

I. Overall Rankings of the 2018 China Regional Intellectual Property Rights Index Report

Within the region of mainland China, the overall top 10 ranking provinces within the 2018 Index Report (including autonomous regions and municipalities directly under the Central Government, hereinafter collectively referred to as provinces) are (from top to bottom): Beijing, Guangdong, Jiangsu, Shanghai, Zhejiang, Shandong, Anhui, Tianjin, Hubei, and Chongqing.

The provinces (11 provinces) ranked in the middle are: Hunan, Fujian, Shaanxi, Sichuan, Liaoning, Henan, Guangxi, Jilin, Jiangxi, Hebei, and Heilongjiang.

The 10 provinces ranked in the bottom of the report are: Guizhou, Shanxi, Gansu, Yunnan, Inner Mongolia, Hainan, Ningxia, Qinghai, Tibet and Xinjiang (Please refer to Figure 1-1).

Table 1-1 Overall rankings of 2018 China Regional Intellectual Property Rights Index

¹ Originally known as the “State Intellectual Property Office (People’s Republic of China)”

Province	Comprehensive						Comprehensive		Creative	
	Strength		Output Level		Flow Level		Performance		Potential	
	Index	Ranking	Index	Ranking	Index	Ranking	Index	Ranking	Index	Ranking
Beijing	0.593	1	0.634	1	0.594	2	0.649	1	0.497	3
Guangdong	0.536	2	0.425	3	0.661	1	0.532	4	0.525	2
Jiangsu	0.509	3	0.487	2	0.415	4	0.491	6	0.644	1
Shanghai	0.466	4	0.415	4	0.485	3	0.620	2	0.344	6
Zhejiang	0.422	5	0.391	5	0.264	6	0.565	3	0.468	4
Shandong	0.321	6	0.213	11	0.297	5	0.368	13	0.405	5
Anhui	0.286	7	0.348	6	0.170	12	0.364	14	0.262	9
Tianjin	0.282	8	0.215	10	0.161	15	0.494	5	0.258	10
Hubei	0.279	9	0.203	12	0.204	7	0.391	9	0.318	7
Chongqing	0.251	10	0.160	15	0.170	11	0.467	7	0.206	15
Hunan	0.251	11	0.153	16	0.166	13	0.412	8	0.272	8
Fujian	0.246	12	0.177	13	0.173	9	0.390	10	0.246	11
Shaanxi	0.243	13	0.215	9	0.172	10	0.372	11	0.213	14
Sichuan	0.230	14	0.230	8	0.163	14	0.307	20	0.218	13
Liaoning	0.225	15	0.153	17	0.193	8	0.370	12	0.183	16
Henan	0.209	16	0.135	19	0.135	17	0.329	17	0.236	12
Guangxi	0.206	17	0.290	7	0.082	22	0.297	22	0.157	21
Jilin	0.177	18	0.088	25	0.136	16	0.351	15	0.133	24
Jiangxi	0.169	19	0.104	20	0.091	21	0.316	19	0.165	19
Hebei	0.164	20	0.088	24	0.112	18	0.280	24	0.174	17
Heilongjiang	0.161	21	0.164	14	0.092	20	0.245	27	0.142	23
Guizhou	0.156	22	0.148	18	0.045	26	0.262	25	0.170	18
Shanxi	0.149	23	0.077	28	0.067	24	0.330	16	0.124	28
Gansu	0.144	24	0.081	26	0.106	19	0.227	29	0.162	20
Yunnan	0.138	25	0.102	21	0.079	23	0.230	28	0.142	22
Inner Mongolia	0.133	26	0.038	31	0.044	27	0.325	18	0.125	26
Hainan	0.131	27	0.077	27	0.017	30	0.307	21	0.124	27
Ningxia	0.126	28	0.097	23	0.041	28	0.260	26	0.105	29
Qinghai	0.114	29	0.102	22	0.059	25	0.208	31	0.087	31
Tibet	0.113	30	0.059	30	0.014	31	0.290	23	0.090	30
Xinjiang	0.113	31	0.076	29	0.040	29	0.210	30	0.127	25

II. 2018 China Regional Intellectual Property Rights Index Report: Major Finding

The *China Regional Intellectual Property Rights Index Report* was initially prepared starting from 2009, covering all 31 provinces in mainland China with the exception of Hong Kong, Macau, and Taiwan. With years of accumulation of

empirical data, we were able to construct a comprehensive database that is capable of profoundly analyze intellectual property status among the various regions of China (provinces). We approach our analysis by contrasting time (vertically) and geographical space (horizontally), and it is our finding that:

1. The top 10 provinces enjoy a stable long-term development, and Beijing remains in the 1st place for 9 consecutive years

Since 2010, rankings of the top 10 provinces enjoy a comparatively stable long-term development. Provinces such as Beijing, Jiangsu, Shanghai, Guangdong, Zhejiang, Tianjin, and Shandong were ranked among the top 10 placements each year, with Beijing sitting at the 1st place for nine consecutive years. Fujian and Chongqing have each fallen out of the top 10 once and twice, respectively (Chongqing ranked 12th in the Index Report 2011, Fujian ranked 11th and 12th in the index report 2017 and 2018, respectively). The province of Liaoning has not been ranked in the top 10 since 2015. The province of Anhui has been continuously ranked among the top 10 since 2015, while the province of Hunan and the province of Hubei has each been ranked among the top 10 once and twice, respectively. Please refer to Chart 1-2 for a detailed ranking.

Analyzing the Top 10 provinces of the *2018 Intellectual Property Index Report*, it is not difficult to find that most of the provinces are relatively economically developed. Looking at the data from a geographic perspective, seven of these provinces are from the eastern region, with only Anhui and Hubei from the middle region, and Chongqing from the western region of China. In addition, from a regional perspective, the Bohai Bay Economic Circle (Rim) includes provinces such as Beijing, Tanjing, and Shandong. The Yangtze River Delta Economic Circle (Rim) includes provinces such as Jiangsu, Shanghai, Zhejiang, and Anhui. The Pearl River Delta economic circle includes the province of Guangdong.

Table 1-2 Top 10 China regional intellectual property rights index over the years

Ranking	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	Bei-jing	Bei-jing	Bei-jing	Bei-jing	Bei-jing	Bei-jing	Bei-jing	Bei-jing	Bei-jing
2	Shang-hai	Shang-hai	Shang-hai	Shang-hai	Jiang-su	Jiang-su	Jiang-su	Jiang-su	Guang-dong
3	Guang-dong	Guang-dong	Guang-dong	Jiang-su	Shang-hai	Shang-hai	Shang-hai	Guang-dong	Jiang-su
4	Jiang-su	Jiang-su	Jiang-su	Guang-dong	Guang-dong	Guang-dong	Guang-dong	Shang-hai	Shang-hai
5	Zhe-jiang	Zhe-jiang	Zhe-jiang	Zhe-jiang	Zhe-jiang	Zhe-jiang	Zhe-jiang	Zhe-jiang	Zhe-jiang
6	Tianjin	Shan-dong	Shan-dong	Shan-dong	Tianjin	Tianjin	Shan-dong	Shan-dong	Shan-dong
7	Shan-dong	Tianjin	Tianjin	Tianjin	Shan-dong	Shan-dong	Tianjin	Tianjin	Anhui
8	Liao-ning	Fujian	Liao-ning	Liao-ning	Liao-ning	Fujian	Chong-qing	Chong-qing	Tianjin
9	Chong-qing	Liao-ning	Fujian	Fujian	Fujian	Chong-qing	Fujian	Anhui	Hubei
10	Fujian	Hunan	Chong-qing	Chong-qing	Chong-qing	Anhui	Anhui	Hunan	Chong-qing

2. The degree of IP developmental differentiation in various regions has not yet diminished, but the differentiatonal gap between the top 10 provinces is steadily lessening

Overall the IP score each province receives differ substantially, with the trend line declining abruptly at the beginning, which eventually steadily smooths out. We adopted the (index) of coefficient of variation² to calculate the rate of dispersion in the IP Index Report.

Comparing the coefficient of variation for the most recent three fiscal periods, with 0.55 of 2016, 0.56 of 2017, and 0.54 of 2018, it is our finding that the overall differentiatonal gap of intellectual property development remains high. This finding can be demonstrated by the fact that the overall median score we obtained from the 2018 Index Report is roughly about 0.209, which is substantially lower than the 0.593 achieve by Beijing, less than a third of Beijing’s index score.

² The calculation formula of coefficient of variation: $C \cdot V = (\text{standard deviations SD} / \text{MEAN}) \times 100\%$.

As indicated by the 2018 Index Report, the (average) coefficient of variation of the top 10 provinces is 0.319; the coefficient of variation of the middle 10 provinces is 0.167; whereas the coefficient of variation of the last 10 provinces is 0.117. As the ranking decreases with each province, the (gap of) coefficient of variation gradually declines less dramatically. This (sharp) decline in turn demonstrates the fact that comparing to more economically advanced provinces such as Beijing, Guangdong, Jiangsu, Shanghai, and Zhejiang, the intellectual property development rate of other provinces is relatively slower. At the same time, by simply comparing to the *2017 Intellectual Property Index Report*, we concluded that the gap of coefficient of variation among the top 10 provinces is narrowing down as well, indicating that the leading advantages maintained by Beijing is also consistently declining (Please refer to Figure 1-1).

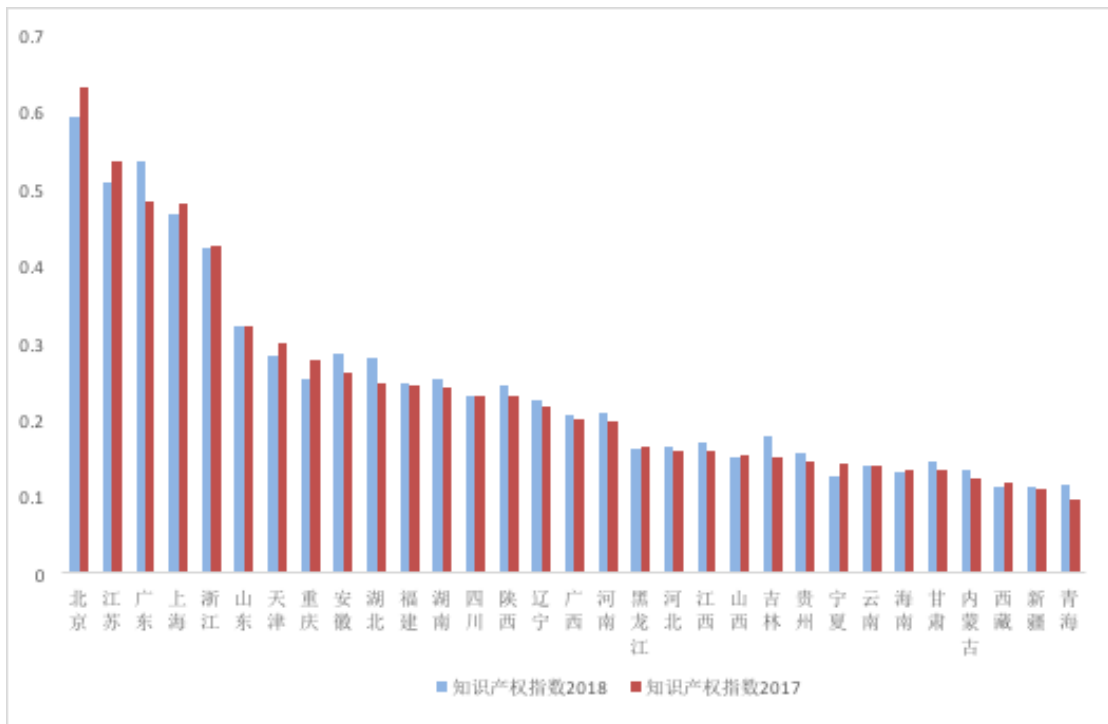


Figure 1-1 A comparison between 2017 and 2018 of the China Regional Intellectual Property Rights Index

3. Regional distribution of intellectual property rights in China resembles a pattern that is comparable to that of a “central agglomeration, and terrace diffusion.” (the level of intellectual property development radiates outward from few highly developed regions and spreads out evenly towards the outer regions of China.)

Over the years, the overall regional distribution of intellectual property (development) is noticeable and quite consistent. The distribution somewhat demonstrates a pattern that is “higher in the eastern region and gradually declines towards the western region,” the level of IP development radiates from the higher “eastern coastal area” of China towards the “central region of China,” the central hinterland so to speak. The level of IP development then gradually moderates and spreads outwards from the “central region” to the “western regions” of China. As such, the (IP development rate of) the three major regions of China resemble a graphical pattern that is similar to the shape of “terrace farming,” altitude declines as the land gradually spreads out. A majority of the top 10 provinces in the Index Report are from the eastern regions of China, the 10 provinces ranked lowest mainly are from the central and western region of China. Looking at the issue from a historical background, the development of intellectual property right correlates strongly with the degree/level of industrialization. Renowned economists such as Dr. Douglas C. North believes that the development of property rights systems, including intellectual property, is a prerequisite for expansion of the industrial revolution. The regional distribution of China’s IP index thus corresponds to its regional economic development level.

Meanwhile, simply by comparing the data collected over the years, we have also concluded that the level of development of intellectual property in China also resembles the regional distribution pattern of “central agglomeration.” That is, the three center-hub of China’s intellectual property right development are Beijing-Tianjin-Hebei, the Yangtze River Delta, and the Pearl River Delta. Spreading and diffusion of technology is thus a crucial mechanisms of regional IP development. The Yangtze River Delta, with Shanghai sitting at the center, is one of the most effective regions in terms of technological diffusion. (Please refer to Figure 1-2)



Figure 1-2 Figure of regional distribution of China regional intellectual property rights index

4. As a result of the strategical policies implemented specifically for the Greater Bay Area (including Guangdong, Hong Kong, and Macau), the average level of IP development of southern China has overall improved with the province of Guangdong leading at the forefront

The greater southern China region is mainly consisted of the Guangdong province, the Guangxi province, and the Hainan province. Within this greater region, benefiting from policies specially implemented for the Greater Bay Area, the IP index score achieve by the province of Guangdong increased from 0.482 to 0.536, placing itself in the second place from the third in 2017. The gap between the province of Guangdong and Beijing is continuously and gradually diminishing. Comparing current data with that of the 2017, placement of the Guangxi Province and the Hainan Province remains unchanged. Driven by the excellent performance of the Guangdong province, the average level of intellectual property right index in the greater southern China enjoyed an overall improvement.

Intellectual property is the driving force for the future of the Greater Bay Area. As of 2016, the total GDP of the Greater Bay Area already surpassed the Bay Area of San

Francisco. Cultural and financial innovation of Hong Kong is still leading the way; technological innovation of Shenzhen is still by far the most progressive; whereas the potential for innovation of the Guangdong province is destined to be momentous. As of today, the three said cities participate together in a joint operation cooperating on issues of intellectual property. As such, The Guangdong, Hong Kong, and Macau Copyright Registration Hall at the Shenzhen Wantong Building is the first copyright registration hall established by the China Copyright Protection Center in the greater southern region of China. As a result of the steps taken by the Greater Bay Area on the construction of intellectual property and the establishment of the “demonstration zone” with respect to the regional intellectual property development, relevant resources can be more effectively allocated, which will in turn stimulate development of cross industry cooperation. It is thus reasonably foreseeable that such progress will radiates outward towards the province of Guangxi and Hainan, and eventually stimulate the entire greater southern China area.

5. The Province of Guangdong leads in the quality of patent, and (as indicated by the empirical data) the quality of patent from the eastern region of China is relatively higher comparing to that of the central and western region

The 10 Provinces ranked with top patent quality are: Guangdong, Beijing, Zhejiang, Jiangsu, Shanghai, Shandong, Fujian, Tianjin, Hubei and Hunan. As such, the 10 Provinces that ranked at the bottom in this respect are: Yunnan, Jilin, Heilongjiang, Inner Mongolia, Hainan, Gansu, Tibet, Qinghai, Ningxia and Guangxi. This demonstrates a pattern that the patent quality index score is relative higher in the eastern region of China, and the patent quality index score is relatively lower in the northern and central western regions.

Table 1-3 Patents quality index ranking

Province	Patents Quality		Province	Patents Quality	
	Index	Ranking		Index	Ranking
Guangdong	0.665	1	Jiangxi	0.136	17
Beijing	0.562	2	Xinjiang	0.136	18

Zhejiang	0.557	3	Shaanxi	0.124	19
Jiangsu	0.460	4	Chongqing	0.121	20
Shanghai	0.303	5	Shanxi	0.117	21
Shandong	0.228	6	Yunnan	0.116	22
Fujian	0.207	7	Jilin	0.112	23
Tianjin	0.199	8	Heilongjiang	0.110	24
Hubei	0.177	9	Inner Mongolia	0.101	25
Hunan	0.169	10	Hainan	0.100	26
Sichuan	0.169	11	Gansu	0.081	27
Henan	0.156	12	Tibet	0.080	28
Guizhou	0.155	13	Qinghai	0.072	29
Hebei	0.149	14	Ningxia	0.044	30
Anhui	0.147	15	Guangxi	0.029	31
Liaoning	0.138	16			

6. Difference between the level of intellectual property output and the quality of patents in some provinces varies significantly

From regional distribution of the quality of patent we are able to identify a phenomenon, that is, the ranking of patent quality generally corresponds to the overall ranking of economic development, yet there are exceptions. Comparing the level of output of intellectual property (with patent quality) among the provinces that ranked top 10 in the patent quality index, Shandong, Hubei, Fujian, and Hunan are placed 11th, 12th, 13th, and 16th, respectively, in terms of intellectual property output. The Guangxi Zhuang Autonomous Region, thou ranked 7th in the average output level of intellectual property, is placed only at 31st on the patent quality index. The province of Shanxi, thou ranked 9th in terms of intellectual property output, is placed at 19th on the quality of patent index ranking. Also, on the IP output index, the province of Anhui ranked 6th, the province of Guizhou ranked 18th, and the province of Qinghai ranked 22nd, yet, on the quality of patent index, those provinces ranked only 15th, 23rd, and 29th, respectively. On the other hand, the province of Hebei, which is ranked only 24th on the IP output index, is unexpectedly ranked 14th on the patent quality index.

7. Improvements made by some western provinces were significant, yet some eastern provinces showed various types of stagnation

The 10 provinces with the highest overall IP improvement index score in China are: Jiangxi, Yunnan, Fujian, Tibet, Hebei, Sichuan, Jilin, Guizhou, Henan, and Hunan. The provinces ranked on the bottom are: Qinghai, Shandong, Jiangsu, Inner Mongolia, Xinjiang, Tianjin, Shanxi, Shaanxi, Liaoning, and Heilongjiang. Analyzing this issue from a historical perspective, it is not difficult to find that provinces from the central and western region are consistently ranked top 10. This demonstrates the pattern that even though central and western provinces had a relatively late start in development, they maintain robust and substantial potential in the near future, and the gap in between these central western provinces and more developed provinces from the eastern region is consistently diminishing. Meanwhile, these empirical data also reveals another phenomenon, that is, provinces within the same greater region gradually differentiates among each other. Some provinces from the western region progresses rapidly, whereas others remain in stagnation, with some provinces even declines in the ranking. There is manifestation of stagnation from provinces of eastern regions as well. For example, the overall improvement index rate of provinces such as Jiangsu and Tianjin remain behind in the ranking. As such, it is our finding that the IP improvement index score correlates relatively precisely with the IP output index score, and it is still the case that within these two aspects, the central western provinces are ranked higher than the eastern provinces.

8. The scale of patent and trademark (registration) manifests unique regional pattern, and such pattern strongly correlates with the rate of economic development

The index score indicates that the scale of patent and trademark (registration and application) of a region strongly correlates with the level of economic development of that region. An economically well-developed region in general has a higher output of commercial products from business/commercial entities, thus the higher rate of patent applications. As such, since market competition of such developed regions are generally fierce/intense, awareness of commercial brand and protection of intellectual property (within the market) is also more comprehensive. Provinces that ranked top 10 in terms of the scale of patent registration are: Beijing, Guangdong, Zhejiang,

Jiangsu, Tianjin, Shanghai, Fujian, Anhui, Shandong, and Chongqing. Provinces ranked at the bottom on this respect are: Hebei, Jilin, Guizhou, Xinjiang, Shanxi, Qinghai, Yunnan, Hainan, Inner Mongolia, and Tibet. With respect to the scale of trademark registration, provinces that ranked top 10 are: Beijing, Shanghai, Guangdong, Zhejiang, Fujian, Jiangsu, Tianjin, Chongqing, Shandong, and Shaanxi, this data is identical to that of the 2017 Index Report. The 10 provinces ranked at the bottom in terms of the scale of trademark registration are: Hebei, Jilin, Jiangxi, Inner Mongolia, Heilongjiang, Qinghai, Guizhou, Shanxi, Guangxi, and Gansu. From a holistic overview, regional characteristics of the scale of patent and trademark registration are quite revealing. Majority of provinces ranked in the top 10 come from more economically developed areas of the eastern region, with only the province of Chongqing, Anhui, and Shaanxi coming from the central region of China. The scale of patent and trademark registration somewhat indicates the vitality of intellectual property in relation to economy, and it is not difficult to find that economically well-developed regions performs better in terms of the scale of patent and trademark registration.

9. The level of intellectual property development of central and western region of China is limited by factors such as business operation environment and ecological environment

The 10 provinces with the lowest proportion of total foreign investment in GDP are mainly from the central and western region of China, including: Xinjiang, Gansu, Heilongjiang, Hunan, Tibet, Guizhou, Henan, Yunnan, Inner Mongolia, and Guangxi. With only the exception of Guangxi (15.91%) and Inner Mongolia (15.10%), the remaining eight provinces all received foreign invest with a percentage of lower than 15%. Especially noticeable is the province of Xinjiang (6.68%), which has a foreign investment ratio of less than 7 percent. At the same time, the 10 provinces that maintain the highest macro tax burden are Tibet, Qinghai, Gansu, Heilongjiang, Guanxi, Henan, Jilin, Hunan, Hebei, and Shaanxi. Of the ten provinces, 6 of them also scored lowest in terms of foreign investment ratio. In addition, the Report also measured

ecological environmental index, calculated by power consumption per unit of GDP, sulfur dioxide emission per unit of GDP, wastewater discharges per unit of GDP, and general solid waste discharge per unit of GDP. Based on the measurements, the power consumption and wastewater discharge rate of the central and western regions are substantially higher than other areas/regions. Thus, the overall business operational environment of the central and western region is still relatively less developed than other areas. The level of green environmental development of the central and western region is still relatively lower than other areas. These factors severally limits the structure of innovative environment of the central and western region of China, and thereby limits the development of intellectual property of such areas/regions as well.

III. 2018 China Regional Intellectual Property Right Index Report: Data Analysis

1. Top 10 of the 2018 China Regional Intellectual Property Rights Index

Provinces ranked in the top 10 places on the IP Index Report are, in descending order: Beijing, Guangdong, Jiangsu, Shanghai, Zhejiang, Shandong, Anhui, Tianjin, Hubei, and Chongqing (Please refer to Figure 1-4). This ranking result resembles the data collected from the 2017 Index Report.

Table 1-4 Top 10 of 2018 China Regional Intellectual Property Rights Index

Province	Comprehensive Strength		Output Level		Flow Level		Comprehensive Performance		Creative Potential	
	Index	Ranking	Index	Ranking	Index	Ranking	Index	Ranking	Index	Ranking
Beijing	0.593	1	0.634	1	0.594	2	0.649	1	0.497	3
Guangdong	0.536	2	0.425	3	0.661	1	0.532	4	0.525	2
Jiangsu	0.509	3	0.487	2	0.415	4	0.491	6	0.644	1
Shanghai	0.466	4	0.415	4	0.485	3	0.620	2	0.344	6
Zhejiang	0.422	5	0.391	5	0.264	6	0.565	3	0.468	4
Shandong	0.321	6	0.213	11	0.297	5	0.368	13	0.405	5
Anhui	0.286	7	0.348	6	0.170	12	0.364	14	0.262	9
Tianjin	0.282	8	0.215	10	0.161	15	0.494	5	0.258	10
Hubei	0.279	9	0.203	12	0.204	7	0.391	9	0.318	7
Chongqing	0.251	10	0.160	15	0.170	11	0.467	7	0.206	15

Overall the City of Beijing maintains its lead in the IP Index Report. Even though the index score it received in 2018 is slightly lower than that of the 2017, it is still ranked first among all 31 provinces. Of the four sub-indexes (category) analyzed in the Index Report, Beijing is ranked 1st in two of these categories. More specifically, Beijing is ranked 1st in both the intellectual property output index and the overall performance (comprehensive performance) index; it is ranked 2nd in the flow level index; and it is ranked in the 3rd place with respect to intellectual property creative potential index. Beijing is the Capital City of China, numerous (top ranked) universities and scientific research institutions directly affiliated with the central government are located in Beijing. Thus, the city of Beijing enjoys a unique advantage with respect to the development of intellectual property. With years of cultivation, the District of Zhong Guan Cun (in Beijing) has already become a symbol of innovation in China. Currently the City of Beijing is endeavoring with full force to construct a national technological innovation center that is capable of global influence, which highly emphasizes on progress of intellectual property. It is thus reasonably foreseeable that the development of IP in Beijing will continue to expand and strengthen in the near future.

The province of Guangdong overall ranked 2nd in the 2018 Index Report, it advanced from the 3rd place in 2017 to the 2nd place in 2018, surpassing the province of Jiangsu. More specifically, with respect to the four sub-indexes (categories), the province of Guangdong ranks 3rd in the IP output level index, 1st in the level of flow index, 4th in the comprehensive performance index, and 2nd in the creative potential index. Previously the province of Guangdong was under intense pressure during the period of economic transition. Yet based on data collected from the past two years, it became apparent that the policy implemented for the Greater Bay Area is beginning to benefit the province of Guangdong. More specifically, Hong Kong is leading in areas such as cultural and financial innovation; technological innovation of Shenzhen is ranked top in the nation; and the potential for innovation in the City of Guangzhou is also substantial. As of today, these three cities participate together in a joint effort cooperating on issues relating to intellectual property, and the cooperation is

continuously becoming more effective.

The province of Jiangsu ranked 3rd in 2018. From the fourth place in 2009, the province of Jiangsu gradually advances on the index, and is consistently been ranked in the 2nd place since 2014. Comparing with Beijing, which is still sitting at the first place, there is still a considerable gap between Jiangsu and Beijing. Within a foreseeable short term, it is still difficult for Jiangsu to advance to the level of Beijing. Of the four sub-indexes, Jiangsu is placed 2nd in the level of IP output, 4th in the level of flow index, 6th in the overall comprehensive performance index, and 1st in the index of potential for innovation. These findings resemble that of the findings from 2017. Of the four sub-indexes, the province of Jiangsu scored lowest in the category of comprehensive performance. Different from Beijing, the development of intellectual property of Jiangsu mainly relies on industries and (commercial) enterprises, thus from a policy perspective, incentives and subsidies should continuously be provide to enterprises (within the region) for further development of intellectual property.

The City of Shanghai ranked 4th in the 2018 Report Index. In terms of ranking, Shanghai has been closely following Beijing since 2014, and dropped to 4th from the second place in 2017, surpassed by only Jiangsu and Guangdong. With respect to the four sub-indexes, the City of Shanghai is ranked 4th in terms of intellectual property output index, 3rd in the level of flow index, 2nd in overall comprehensive performance, and 6th in innovative potential index. Looking at the sub-indexes, the City of Shanghai should be cautious for lack of innovative potential. In accordance to the national “Thirteenth Five-Year Plan,” the City of Shanghai plans to construct a technological innovation center that is capable of global influence. For this purpose, the city needs to further strengthen progress made on intellectual property by building an international transaction center for intellectual property, and a regional talent center for intellectual property.

The province of Zhejiang is consistently remaining in the 5th place for many years, its ranking is relatively steady. With respect to the four sub-indexes, the province of Zhejiang ranked 5th in the intellectual property output index, 6th in the flow level index, 3rd in overall comprehensive performance, and 4th in the creative potential index. The

overall performance of the province is relatively stable.

The province of Shandong ranked 6th in the 2018 Report Index, its ranking has been fluctuating between 6th and 7th for the past few years. With respect to the four sub-indexes, Shandong is ranked 11th in the intellectual property output index, fifth in the level of flow index, 13th in the overall comprehensive index, and 5th in the innovative potential index. Comparing these rankings, Shandong scores relatively higher in the level of flow and creative potential indexes. This indicates that the scale and scope of enterprises from Shandong to self-import and utilize intellectual property is relatively greater and more effective. Shandong also retains a substantial potential for innovation. However, the province of Shandong is still limited with respect to independent research and development, and the efficiency of enterprises in utilizing and using intellectual property still needs to be improved.

The province of Anhui ranked 7th in the 2018 Report Index. Since 2015, the Anhui province has been steadily placed among the top 10, it made further advancement in the year of 2018. With respect to the four sub-indexes, the province of Anhui ranks sixth in the intellectual property output index, 12th in the level of flow index, 14th in the overall comprehensive performance index, and 9th in the innovative potential index. The level of intellectual property output of Anhui is significantly higher than the other three sub-indexes.

The City of Tianjin ranked 8th in the 2018 Report Index, moving down by one spot from the 2017 Report Index. With respect to the four sub-indexes, Tianjin is ranked 10th in the intellectual property output index, 15th in the level of flow index, 5th in the overall comprehensive performance index, and 10th in the creative potential index. The IP output level and flow level of Tianjin is somewhat less satisfactory; however, the overall performance is still adequate. The City of Tianjin should utilize opportunities from the newly implemented policy for the “Beijing, Tianjin, and Hebei Region,” as well as the establishment of the new “Xiongan” District, thereby enhance its IP output level.

The province of Hubei ranked 9th in the 2018 Report Index, advancing one placement from the 2017 Report Index. With respect to the four sub-indexes, Hubei

ranks 12th in the intellectual property output index, 7th in the level of flow index, 9th in the overall comprehensive performance index, and 7th in the innovative potential index. The level of IP output of Hubei is substantially lower comparing to the other three sub-indexes.

The province of Chongqing secured the last placement in the top 10 ranking, which remains the same as the 2017 Report Index. It is also the only province coming from the eastern region of China. With respect to the four sub-indexes, Chongqing is ranked 15th in the intellectual property output index, 11th in the level of flow index, 7th in the overall comprehensive performance index, and 15th in the creative potential index. The level of IP flow and overall comprehensive performance are relatively satisfactory. Yet the province should focus more in areas such as the intellectual property output level and potential for innovation, which is significantly lower than other provinces from the top 10 ranking. Addressing this matter, the province of Chongqing should increase investments in areas such as technological research, scientific and technological personnel training, and importation of intellectual property. Chongqing should also establish and construct relevant institutions and mechanisms to overcome the relative disadvantages of its geographical location, to defeat its geographical disadvantages with “policy advantages” so to speak.

2. Ranking of various greater regions: The Eastern China Region, Greater Southern China Region, and the Greater Northern China Region are ranked top three

The overall (IP development) level of the eastern region, southern region, northern region and the central region of China leads above the national level. Further, the southwest region, northeast region, and northwest region of China falls below the national level. The precise ranking of all regions is as follow: the greater eastern region, the greater southern region, the greater northern region, the greater central region, the greater south eastern region, the north eastern region, and the northern west region. Comparing with the Report Index from 2017, the Greater Southern Region surpasses the greater northern region, and is currently ranked in the second place. (Please refer to Figure 1-3 and 1-5 for details)

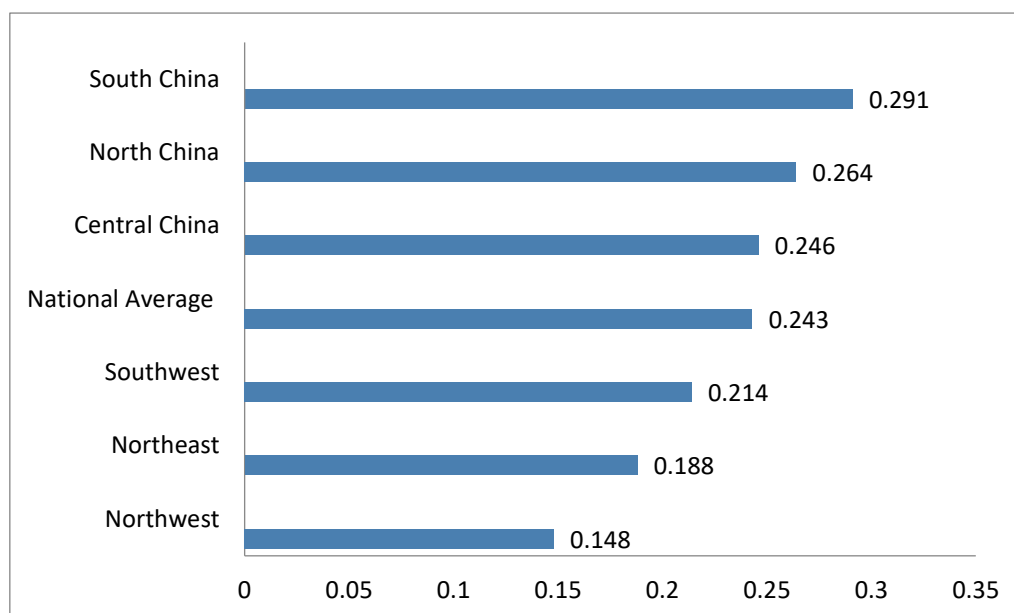


Figure 1-3 Contrast of the average level of regional intellectual property rights index and national average level

Table 1-5 Regional intellectual property rights index situation

Region	Intellectual property rights index	Regional ranking	Best city in the region
East China	0.346	1	Jiangsu
South China	0.291	2	Guangdong
North China	0.264	3	Beijing
Central China	0.246	4	Hubei
Southwest	0.214	5	Chongqing
Northeast	0.188	6	Liaoning
Northwest	0.148	7	Shaanxi
National average	0.243		

The Greater Eastern Region: the overall strength and capability of this region is amongst the most robust, motivated by the significant performance of Jiangsu and Shanghai

The Greater Eastern Region is constituted of 6 provinces and a municipality directly under the Central Government, they are: the province of Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi, Shandong, and the City of Shanghai. It is one of the most densely populated areas in China. The overall IP index score of the Greater Eastern Region in 2018 is 0.346, which is significantly higher than the national average.

Among the national top 10 ranking, five provinces come from the greater eastern region, they are: Jiangsu, Shanghai, Zhejiang, Shandong, and Anhui; the Fujian province is ranked 12th; with only the province of Jiangxi ranked lower in the national ranking. Most notably, Jiangsu and Shanghai received an intellectual property index score of 0.509 and 0.466, respectively, which strongly demonstrate the powerful radiating effects of the two areas.

The greater eastern region of China has historically been one of the most economically developed regions, abundant in all types of natural resources and it is also a cultural center hub. The region enjoyed a speedy international trade development as a result of the Open-door policy since the early 1980s, it is also becoming one of the most economically and IP developed regions of China via the help of importation of technology, training of domestic professionals, and self-reliance on research and development of technology. (Please refer to Figure 1-6)

Table 1-6 Intellectual property rights index and ranking table in east China

Province	Intellectual property rights index	Ranking within the region	National ranking
Jiangsu	0.509	1	3
Shanghai	0.466	2	4
Zhejiang	0.422	3	5
Shandong	0.321	4	6
Anhui	0.286	5	7
Fujian	0.246	6	12
Jiangxi	0.169	7	19
East China	0.346		
National average	0.243		

The Greater Southern Region of China: the province of Guangdong surpasses other areas, the policy advantages of the Greater Bay Area is becoming increasingly substantial

The greater southern region of China includes the province of Guangdong, Guangxi, and Hainan. Within the region, IP index of the province of Guangdong increased from 0.482 to 0.536 as a result of the policy advantages implemented for the

Greater Bay Area, as mentioned earlier. The province of Guangdong also advanced to the second place from 2017's third place, thereby continuously diminishing its gap with the City of Beijing. Comparing the data collected from 2017, the ranking of Guangxi and Hainan remains rather stable, and the outstanding performance of Guangdong in turn stimulated the level of intellectual property development of the entire greater southern region. Via the establishment and construction of the Greater Bay Area, and through the regional demonstration zone³ for collaborative development of intellectual property, relevant resources in innovation will be more effectively allocated in terms of stimulating a joint development of the industry. The effect of Guangdong's outstanding performance is destined to radiate outwards towards the province of Guangxi and Hainan in the near future, which will in turn stimulate the development of the entire greater southern region. (Please refer to Figure 1-7)

Table 1-7 Intellectual property rights index and ranking table in south China

Province	Intellectual property rights index	Ranking within the region	National ranking
Guangdong	0.536	1	2
Guangxi	0.206	2	17
Hainan	0.131	3	27
South China	0.291		
National average	0.243		

The Greater Northern Region of China: the overall strength of intellectual property is robust, and the synergy effect of Beijing-Tianjin-Hebei is reinforcing

The greater northern region of China consists of three provinces and two municipalities directly under the central government, they are: the province of Hebei, Shanxi, Inner Mongolia, the city of Beijing, and the City of Tianjin. This is also one of the more densely populated regions of China. The average intellectual property index score of this region is 0.264, which is slightly higher than the national average, yet it falls behind of the greater eastern and southern region of China. Comparing the data at hand with that of the 2017, even though the greater northern region falls behind

³

the greater southern region, it is still the third ranking region of China. In addition, the synergy effect of Beijing-Tianjin-Hebei remains relatively constant and stable.

The City of Beijing is the center-core of intellectual property development in the greater northern region, sitting at the 1st place of the national intellectual property index ranking. The City of Tianjin follows closely behind and is ranked at 2nd place within the region. With the policy implementation of several major scientific and technological projects as a result of the “13th Five-Year Plan Period,” the City of Tianjin retains substantial potential in the area of intellectual property development.

One of the major issues burdening the greater northern region of China has always been uneven development. Intellectual property development of provinces other than the City of Beijing and Tianjin falls far behind. The province of Hebei, Shanxi, and Inner Mongolia are ranked respectively at 20th, 23rd, and 26th, a slight improvement comparing with 2017. With the further deepening of the Beijing-Tianjin-Hebei cooperation, and the establishment of the new Xiongan District, the prospect of intellectual property development in the greater northern China is promising. (Please refer to Figure 1-8 for details.)

Table 1-8 Intellectual property rights index and ranking table in north China

Province	Intellectual property rights index	Ranking within the region	National ranking
Beijing	0.593	1	1
Tianjin	0.282	2	8
Hebei	0.164	3	20
Shanxi	0.149	4	23
Inner Mongolia	0.133	5	26
North China	0.264		
National average	0.243		

The Greater central region of China: within the region, the level of intellectual property development among various provinces are relatively equal, and the province of Hubei leads in the ranking

The greater central region of China consists of three provinces, they are: the province of Henan, Hubei, and Hunan. Development of intellectual property within the region is relatively balanced and is on par with the national average level. Within the region, the province of Hubei is ranked 1st, with an intellectual property index score of 0.279; it is ranked 9th in the national ranking. The province of Hunan is ranked 2nd within the region, with an intellectual property index score of 0.251; it is ranked 11th in the national ranking. The province of Henan falls behind in the third place within the region, it scored 0.209 on the intellectual property index, and it is ranked 16th in the national ranking. (Please refer to Figure 1-9 for details)

Table 1-9 Intellectual property rights index and ranking table in central China

Province	Intellectual property rights index	Ranking within the region	National ranking
Hubei	0.279	1	9
Hunan	0.251	2	11
Henan	0.209	3	16
Central China	0.246		
National average	0.243		

The North East Region of China: the overall performance of the region is less satisfactory, yet its overall ranking advanced slightly

The northeast region of China consists of the Liaoning province, Jilin province, and the Heilongjiang province. The overall rate of IP development within the region is below the national average. Within the region, the IP index score of Liaoning is 0.225 and leads in the region, it is ranked 15th in the national ranking. The intellectual property index score of Jilin and Heilongjiang are respectively 18th and 21st. Index score of the latter two provinces advanced slightly comparing to that of the 2017 ranking. (Please refer to Figure 1-10 for more detail)

Table 1-10 Intellectual property rights index and ranking table in northeast

Province	Intellectual property rights index	Ranking within the region	National ranking
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Liaoning	0.225	1	15
Jilin	0.177	2	18
Heilongjiang	0.161	3	21
Northeast	0.188		
National average	0.243		

The Southwest and the Northwest region of China: overall performance of Chongqing, Shaanxi, and Sichuan is outstanding, yet the overall level of all other provinces within the region is less satisfactory

The southwest and the northwest region of China is consisted of 10 provinces. The economic foundation of the two regions is relatively weaker. The rate of intellectual property development substantially falls behind the national average level. There are some exceptions however, for example, Chongqing, Shaanxi, and Sichuan respectively ranked 10th, 13th, and 14th on the national ranking. (Please refer to Figure 1-11)

Table 1-10 Intellectual property rights index and ranking table in southwest and northwest

Province	Intellectual property rights index	Ranking within the region	National ranking
Chongqing	0.251	1	10
Sichuan	0.230	2	14
Guizhou	0.156	3	22
Yunnan	0.138	4	25
Tibet	0.113	5	30
Southwest	0.214		
Province	Intellectual property rights index	Ranking within the region	National ranking
Shaanxi	0.243	1	13
Gansu	0.144	2	24
Ningxia	0.126	3	28
Qinghai	0.114	4	29
Xinjiang	0.113	5	31
Northwest	0.148		
National average	0.243		