

## **Intellectual Property Protection Seeking Patterns in Relation to China's Five Year Economic Plans**

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### **Abstract**

*This study looks to examine the impacts on intellectual property protection seeking for patents and trademarks by both resident and foreign investors based on the assumption that the Chinese government's five-year plans have significant impact on intellectual property protection seeking. The research includes analyzing data collected that shows the total patent and trademark applications submitted by both Chinese citizens and by foreigners and testing for significant increases or decreases in applications submitted with the corresponding five-year year plans. The finding supports the hypothesis of intellectual property indicators mirroring the intentions laid out in the five-year plans.*

**Keywords:** China, Intellectual Property, Patents, Trademarks.

### **1. Introduction**

The Chinese government has long been criticized for its lacking ability to protect intellectual property rights (Godinho & Ferreira, 2011). This has resulted in a backlash and a decrease in intellectual property related investments within China. This study is looking to show the Chinese government's new approach in gaining intellectual property applications by both foreigners and residents, through publicly stating a greater emphasis on intellectual property development in their five-year plans. The primary goal is to explore application data to see if supportive evidence exists that the Chinese government is increasing intellectual property protection through implementing various strategies within their five-year plans to target investors and create more confidence in their intellectual property protection regime.

### **2. Literature Review**

According to Wong (2006), trademark violations were showing a sharp increase in the few years prior to 2006. Further, the results of that research pointed to a suggested establishment of a more effective court system to address trademark abuses. Later, Hu (2009) indicated that such a system had since been put into action but had yet to demonstrate the desired level of effectiveness. Hu also indicated that bilateral trade agreements were also in effect as an additional measure of enforcement. Chow (2000), assessed the damages on foreign investments via trademarks and the lack of governmental ability to stop offenses. Those results illuminated the complex problem of the Chinese government's inability to protect foreign investment in the Peoples Republic of China and called for a strengthening of the court system and not just rhetoric.

Research done by Godinho & Ferreira (2011) indicated a sharp increase in the number of patents and trademarks being filed in both India and China. Godinho & Ferreira sought to discover what the driving force was for the number of patents and trademarks being applied for when China and India have a long history of failure to protect intellectual property. Their research concluded that the drive for technological innovation in both countries is driving the number of patent and trademark rates higher as well as foreign investors driving to increase private property ownership and private property laws in India and China.

Sun (2003), noted the vast differences in the types of patents applied for between foreign companies and domestic individuals in the period from 1985 to 1999. The results noted that the patent types were different and the system of applying for a patent is similar in China as in other countries. However, the additional discovery which pertains to this paper was in the conclusion that China was more focused on technological improvements and not protecting the actual patents. Later, Sun & Du (2010) discussed the effectiveness that foreign direct investment, in regards to patents and innovation was having on the spillover effect within the economy. An implication of this is, the test highlighted that there was a positive relationship between foreign direct investment (FDI) and growth but that the Chinese government should work to increase the linkages between the relevant bureaucracies to improve the effectiveness of enforcement, which should in turn increase FDI.

A study by Hanson & Shimotake (2006), tested the improvement to patent rights in China and India in accordance to World Trade Organization Standards. The article focused primarily on how the new laws affected pharmaceuticals. Hanson and Shimotake ended up concluding that China was working to fulfill its international and legal duties to get its patent rights into accordance with the WTO standards. However, the authors noted that due to China's history of weak intellectual property protection enforcement and a lacking judicial system, companies would still have a tendency to be hesitant about investing with pharmaceuticals in China. Hanson and Shimotake's work is very similar to that of Zhang and Deng (2008), who researched the effectiveness of patent protection in both the pharmaceutical and biotechnology fields in China. They noted that sufficient growth and economic expansion has made China a tremendous place for foreign investment in the pharmaceutical and biotechnology industry. They concluded their research by stating that even though China presents a great opportunity, a strong, centralized enforcement of patent protection policies must be maintained to keep investment levels growing.

Zhang (1997), studied the enforcement of intellectual property rights in China and advances within the government to protect intellectual property. The article posted findings of the Chinese government's desire to enforce intellectual property rights to spur foreign investment. However, an improved court system must be implemented to support the enforcement of intellectual property laws. Bosworth and Yang (2000), published research similar to that of Zhang (1997). They studied the implications of how intellectual property rights protection in China affected the effectiveness of FDI. The authors believed that the progress China made was substantial considering their culture and hoped to see enhancements in protecting intellectual property in the future.

Bosworth and Yang (2000), compiled research regarding the implications of a lack of intellectual property laws would have on trying to spur an increase of the inflow of technology in China. Their research concluded that China was indeed trying to satisfy foreign investors of technology by modernizing its intellectual property laws. However, the author's note China is still lacking severely in enforcement of laws and conclude China's admittance into the WTO should hopefully increase enforcement.

A novel approach to assessing intellectual property protection changes based around an event point in time was conducted by Christie (2013), when looking at the Eurasian Economic Community formation date as a midpoint for viewing patent and trademarks application changes prior to and after that strike point using a ten year window on each side. This current research will seek to utilize a similar methodology to assess the Chinese intellectual property factors in the five year increments associated with the five year plans produced by the Chinese government.

### **3. Methodology**

The literature review above helps form the primary research question and its related hypothesis statements for testing.

***“How have the objectives outlined in China's five- year plans stimulated intellectual property protection seeking?”***

This study will attempt to answer this question relying primarily on the methodology mentioned above by Christie (2013) using the end point years of the five-year plans in question as the strike points. This methodology is unique from, while building upon that of Christie (2013), in that it is using multiple strike points for analysis as opposed to just a single year.

**Hypothesis 1:**

**A: Objectives outlined in China's five-year plans will have a positive impact on stimulating intellectual property protection seeking.**

With a resulting alternative hypothesis of:

**Null Hypothesis 1:**

**O: Objectives outlined in China's five-year plans will not lead to a significant increase in stimulating intellectual property protection seeking.**

To begin the exploratory analysis raw data was collected from the World Development Indicators that would encompass the last three five year plans, excluding for the year 2015 which was not available at the time this study was conducted. The data was separated by applications for patents (PAT TOT) and trademarks (TM TOT) and then further deconstructed to differentiate by application by residents (PAT RES and TM RES) or by non-residents (PAT FOR and TM FOR). The resulting data is presented below in Table 1.

	PAT TOT	TM TOT	PAT RES	PAT FOR	TM RES	TM FOR
<b>2001</b>	63,450	259,924	30,038	33,412	229,775	30,149
<b>2002</b>	80,232	364,948	39,806	40,426	321,034	43,914
<b>2003</b>	105,317	446,654	56,769	48,548	405,620	41,034
<b>2004</b>	130,384	581,805	65,786	64,598	527,591	54,214
<b>2005</b>	173,327	659,148	93,485	79,842	593,382	65,766
<b>2006</b>	210,501	741,942	122,318	88,183	669,276	72,666
<b>2007</b>	245,161	681,358	153,060	92,101	604,952	76,406
<b>2008</b>	289,838	669,088	194,579	95,259	590,525	78,563
<b>2009</b>	314,604	808,546	229,096	85,508	741,764	66,782
<b>2010</b>	391,177	1,057,480	293,066	98,111	973,462	84,018
<b>2011</b>	526,412	1,388,399	415,829	110,583	1,273,827	114,572
<b>2012</b>	652,777	1,619,878	535,313	117,464	1,502,540	117,338
<b>2013</b>	825,136	1,848,858	704,936	120,200	1,733,364	115,494
<b>2014</b>	928,177	2,104,534	801,135	127,042	1,997,014	107,520

**Table 1: Intellectual Property applications by type and source with five year delineation**

The table above was color coded for data visualization purposes to expose the trend of normal (blue), significantly low (green), and significantly high (red) years for application. This was determined for both patents and trademarks and their sub-categories by way of statistical measure of the mean for each category and then calculating the standard deviation for the categories and determining the upper and lower bound of one standard deviation from the mean. The 'normal' years (68% of the data set) are between the upper and lower bounds presented in the summary table 2 and 3 below. Significantly low years are those who applications fall below the lower bound and significantly high years are those who fall above the upper bound.

	TM RES	TM FOR	TM TOT
Mean	868,866	76,317	945,183
Std. Dev.	548,788	28,889	575,088
Upper Bound	1,417,654	105,206	1,520,271
Lower Bound	320,079	47,428	370,095

**Table 2: Summary statistics for Trademark categories**

	PAT RES	PAT FOR	PAT TOT
Mean	266,801	85,806	352,607
Std. Dev.	253,448	29,695	279,280
Upper Bound	520,249	115,501	631,886
Lower Bound	13,353	56,110	73,327

**Table 3: Summary statistics for Patent categories**

#### **4. Results & Discussion**

Analysing the data constructed to see if there were significant increases in patents and trademarks both domestic and foreign, the relationship between the increases in data follow the construct of China's five-year plans. China's 10<sup>th</sup> five-year plan was implemented to improve information technology at all levels of the economy. Some of the basic goals outlined within the plan include improving science and technology innovation to speed-up technological advancement, increasing the net income per resident throughout the entire country and the expansion of the information industry with hopes of sector spill overs bolstering growth in other economic sectors.

The data shows there were insignificant increases in total Patent and Trademark applications in the year 2001 with the years following the remainder of the Five-year plan showing the data falling in-between the standard deviation. While foreign patent and trademark applications were insignificant from the years spanning 2001-2003 with the remaining data falling within the standard deviation. Resident trademark applications were insignificant for the year 2001 while the remaining years were within the standard deviation. Resident Patent applications were within the standard deviation for all the years included in the 10<sup>th</sup> five-year plan. What this data indicates is that the Chinese government, in order to spur an increase in the information technology sector, is going to take time because of the lack of intellectual property protection exhibited by China during the early years of economic transformation.

The Chinese government is hoping to expand and grow their economy but innovations and growth stemming from intellectual property will take time, highlighted especially from the insignificant increases in the foreign applications. Foreign companies will want to see substantive steps taken by the government before they begin investing in an economy that has a government that does little to protect intellectual property. Domestic applications will remain to fall in-between the standard deviation until income levels rise to the point where patents and trademarks are affordable to a wider variety of Chinese citizens.

Looking at the data associated with China's 11<sup>th</sup> five-year plan, an era of consistent increase in all the areas measured is present. None of the categories being monitored showed any significant increase with all the data falling within the standard deviations. When looking at the data we see steady increases in foreign patent and trademark applications until the year 2009. In 2009 the data dips slightly for those two categories, but increases again in 2010.

China's 11<sup>th</sup> five-year plan spanned from years 2006 to 2010. In that time the Chinese government attempted to strengthen resolutions and goals outlined in the 10<sup>th</sup> five-year plan and hoped to build upon different sectors of the economy through innovations and increased patent and trademark investment. The Chinese government shaped the 11<sup>th</sup> five-year plan to put increased emphasis on structural reform of enterprises through innovation and international competition. Individual innovation is stated as being the primary driving force behind the advancement of primary, secondary and tertiary industries as well as the economy in general. The push in individual innovation will come with an increased focus in the science and technology sector rather than traditional capital investment.

The 11<sup>th</sup> five-year plan highlights an important turning point in the Chinese approach to trademark and patent applications both foreign and domestic. This in turn is noted in the increases in total patent and trademark applications along with increases in foreign and domestic total trademark and patent applications. Increasing individual innovation is an attempt at inspiring patent and trademark applications within the technology and science sectors of the economy. One could conclude that the reason patent and trademark applications are rising in both foreign and domestic applications is because of the precedent being set in the five-year plans laid out by the Chinese government.

The only reason that these increases are not significant in terms of applications being collected is because of the amount of scepticism still prevalent in regards to China's intellectual property protection.

It has been noted previously the extensive difficulties China has had in instilling and enforcing significant changes within their intellectual property protocols. However, these new desires brought forth in the five-year plans could be signalling a much-needed change to achieve their desired goals. Even though these increases in total trademark and patent applications have not risen significantly, it can be concluded that the Chinese government is improving its intellectual property laws in hopes of achieving all the goals laid out in their 10<sup>th</sup> and 11<sup>th</sup> five-year plans.

Another interesting interpretation of the data presents a sharp difference in the total number of applications for patents and trademarks applied for by domestic compared to foreigners. Residential applications vastly outnumber the applications by foreigners in both trademark and patent applications. This could be caused by the great influence the Chinese people feel from the impact of the Chinese five-year plans. If Chinese government officials are calling for greater investments into private innovation, they are first going to try and pull from their own citizens, branching out into foreign investment later in the process. However, the reason that foreign applications may not be at the same levels as residential ones, could be due to the scepticism in the Chinese government ability to protect their patents and trademarks. Foreigners might first want to see any new changes brought about by the Chinese inclusion into the WTO and how the intellectual property offices respond to the influx of Chinese domestic applications before investing into an unknowing situation.

The Chinese government's 12<sup>th</sup> five-year plan is the first to recognize success from the previous two five-year plans and it is written to continue growth within the technology and information technology sectors. The one major change within the 12<sup>th</sup> five year plan is the Chinese government recognizing lags in income and standard of living improvement to the rural areas of the country and not just the major metropolitan area. The Chinese government hopes that with its latest five-year plan that scientific progress and innovation will be expanded to all areas of the country and there will be an immense emphasis on environment preservation and pollution reduction. The 12<sup>th</sup> five-year plan also hopes to create economic demand with putting even larger emphasis on private investment both foreign and domestic. The 12<sup>th</sup> five-year plan is the first to highlight significant increases in the data for total patent and trademark applications both foreign and domestic. The 12<sup>th</sup> five-year plan spans from 2011-2015, and starting from the year 2011 is the first year foreign trademark applications show a significant increase in applications. Following 2011 every category spanning from patent and trademark total, to patent and trademark both foreign and domestic demonstrate significant increase in their applications.

When looking at the data spanning 2012-2014 with every tested data point showing a significant increase in applications the conclusions can be drawn that the Chinese government has effectively implemented its five-year plans with positive impacts and contributions from intellectual property. Through scientific innovation and encouraging private investment, both foreign and domestic, and by strengthening intellectual property protections, has led to significant increases in both foreign and domestic trademark and patent applications. Individuals both foreign and at home have the confidence in the Chinese government that their patents and trademarks will be protected and that the Chinese government has created an innovative and investment oriented environment.

## 5. References

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