DO THE TRANSFORMATION OF THE CHINESE ECONOMY ENCOURAGES COMPANIES IN CHINA TO REMAIN COMPETITIVE WHILE STILL PROTECTING THEIR INTELLECTUAL PROPERTY RIGHTS?

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Abstract

This article investigates the economic impacts of Intellectual Property Rights of China on its Competitiveness at Country-Level Perspective. A framework of unit root test, co-integration and error correction model(ECM) using the Ordinary Least Squares (OLS) econometric technique is conducted spanning the period 1988-2013.The study reveals that Intellectual Property rights spurs economic growth and a key driver of competitiveness but has a significant negative long run functional relationship with competitiveness. Therefore, policies that enhance law enforcements ability and capacity to detect, investigate, and prosecute Intellectual Property defaulters are essential and be used by policy makers as a proxy for effective, efficient and better protection of Intellectual Property Rights in the Policy implication process in China. Future research direction could be the nexus between the performance of competitiveness sector and Economic growth in China.

Keywords: Intellectual Property Rights; Competitiveness; China, Global Competitive Index; Revealed Comparative Advantage

INTRODUCTION

Intellectual Property Right has become a relevant aspect of monitoring and facilitating sustainable economic growth and development of economies for global competitiveness. None of the economies in the world, especially the developed economies like the USA, UK and that of the emerging market economies such as the BRICS have fully developed intellectual property protection and enforcement mechanisms. It has gained considerable attention to policy makers/regulators, international development partners in order to fully understand the decision of optimizing and providing socioeconomic growth and development. The relationship between Intellectual Property Rights and competitiveness towards economic growth of any economy is crucial in understanding the dynamics of modern systems of creativity, innovation, Research & Development. This research therefore does not neglect the implication of innovative practices of a particular country that is faced with the population growth and low level of awareness within the context of Intellectual Property Right. Intellectual Property (hereinafter, IP) according to the World Intellectual Property Organization (WIPO), refers to the creation of the mindset together with inventions, artistic works, signs, names, descriptions and designs used in commerce which are featured to be public goods that are both non-rivalrous and non-excludable. This implies that individual consumption of goods does not reduce the relieve use of it for consumption by others. Moreover, no one can be efficiently exempted from the good. IP is intricately related to competition towards trade, industrial growth and economic development. It plays a major role in the simulation of industrial and commercial growth of companies and thus fosters economic development. The increasing techniques of innovation explains the improve globalization and national development of both developing and developed nations. These processes are enhanced and stimulate the demand of innovation in various disciplines such as pharmaceuticals and high-technology and thus necessitated the increasing awareness to generate value for the sustained economic growth and development of economies. IP entails two categories, namely;

I. Industrial property that includes inventions, trademarks, copy patents, geographic indications of source and industrial designs.

II. Copyright that includes both music and artistic works such as architecture, sculptures, photographs, drawings, paintings and designs, literary works such as plays, poems, novels and films.

IP is property measured which includes substantial and insubstantial assets that fit into a company's total asset and total resource base whilst Intellectual property Research and development (R&D) is an expense, since they are direct inputs for innovation. Intellectual property rights (IPRs) are defined with diverse degrees of accuracy in diverse multilateral

treaties. However, IPRs are permitted rights given to innovators of intellectual property; as a result, they are provided to generate a ready private market for what would otherwise be a public good with non-rivalries and non-excludable characteristics. Knowledge is personified in; people, new technologies and institutions in ways that has been perceived as a key driving indicator of economic growth and development. The main forms of IPRs are patents, copyrights, trademarks and service-marks, plant breeders' rights (PBRs), Sui genesis rights, and trade secrets.

IPRs facilitate creativity and inventive hard work, but can also create market power and minimize the spread of scientific advances, which can lead to higher prices for consumers. The trade-off between competitive pricing (static efficiency) and incentives for innovation and growth (dynamic efficiency) is examined by economic analyses of IPRs. Consistent with this aspect, policymaking in this area involves harmonizing these contradictory interests. The protection of intellectual property rights (IPRs) to mitigate the risk is the major challenge for most companies to repress when thinking about doing business in China market. IP protection, through patents, copyrights and trademarks is critical and daunting to ensuring that firms pursue innovation through its potentials to produce and uphold uniqueness in the marketplace even for a partial period of time. Intellectual property is of particular relevance to developing economies, especially the emerging markets and is gradually becoming more outstanding in the human race as a key commercial asset and a driving force for technological innovation and development. It is a response to the national infrastructure required for socioeconomic growth, developing national indigenous technological capacity, and for generating export opportunities in the course of enhancement of enterprise competitiveness. Strong and effective intellectual property protection is a decisive factor in promoting technology transfer and attracting foreign direct investment in certain sectors of the economy. In developed countries, there is a good signal that IP is, and has been, important for the approval of invention in some industrial sectors, even though the evidence as to exactly how important it is in diverse sectors is mixed. For example, evidence from the 1980s indicates that petroleum industries, chemical and the pharmaceutical were most important in recognizing that the patent system was essential to innovation. Currently, one would oblige to reckon some segments of information technology and biotechnology. Copyright has also demonstrated vital for the publishing industries, music and film. It is however seen that despite efforts made by developing economies and International organizations towards adopting IPRs, they continue to face low level of acceptance by Governments in adopting the legal right. In this aspect, a complex and emerging issues arise and a proper designed of policies arrangement be put in place to facilitate the implementation of such right in developing economies. Well thought-out as an unexploited resource, China has

engrossed progressively more investments from abroad. Annual utilized foreign direct investment (FDI) inflows into China were just above 600 million dollars in 1983(National Bureau of Statistics of China). By 1990, that amount rose to almost 3.5 billion dollars, and in recent years, FDI inflows have reached almost 70 billion dollars. In the past, China's inflexible government policies made it difficult for private firms to obtain get funding from the government. FDI has made it stress-free for private firms to achieve investment funds and thus has played a key role in the current expansion of China. Therefore, these inflows have encouraged the productivity of not less than fifty percent of China's annual GDP by private firms Poncet et.al (2007).China is on the threshold of fitting a major technology and IP architect, actualizing white horses of patents subject to have effect over Europe and the United States of America coast in the next twenty years empowering China to overshadow important technology areas. This crop up from the responsiveness inside China (largely missed by foreign observers) of the indispensable significance of IP to natural resourcefulness jointly with economic growth and innovativeness of the Chinese. By contrast, the value of intellectual property is being tested at some deep political levels, particularly in Europe, putting in difficulty Europe's competitive base in its international markets. In the mid-1980s, China popularized its first patent and other IP laws, to become submissive with the international Berne and Paris IP treaties. In view of the fact that it has passed further updating laws, its IP laws are of a high quality of global standards. Lately, it made a further revision of its patent law after a draft international widely consultation. The IP laws are civil law positioned (analogous to greater Europe) as averse to UK and USA Common Law. The German Justice Ministry has played an influential role in sustaining advice and support for this process over the last twenty years. Some of the analysis voiced by US companies (for example, no "discovery" in litigation) would apply to any Civil Law system and not just China. Countries to be competitive in the globalized economy, has to accommodate, sustain and ascertain institutional and certified frameworks beneficial to the notion of knowledge and its commercialization. Intellectual property rights play a basic role in this view. Simultaneously, both the production activities of firms and innovation process itself are rapidly globalizing. This step-up disagreement in terms of managing, protecting and enforcing intellectual property rights across borders. Economic countries in renovation face complementary challenges to harmonize into incisive global production networks and to find their own serration in the more and more global value chains. To be at the top, they need to acclimatize technological innovations from abroad, as well as entrust high priority in promoting their own innovative capacities and to move up the value chain over time. Recurrently, IP regimes have a main role to play in this regard. The World Trade Organization in 1994,

trumpeted aspects of Intellectual Property Right (IPR) and thoroughly connected it to trade and economics. The accord also improved the global span of IP protection.

Obsessed with the imperative role of IPR in improving the intensity of intellectual property protection, promoting technological change and economic growth, becomes very important. Nevertheless, China being an open economy, IPRs are an essential element enabling Chinese industries to grow and compete globally, which in turn creates jobs, improves the economy, and advances living standards. China has turned out to be one of the world's leading surplus countries, possessing one of the most substantial foreign exchange reserves in the world. China is a current member of various multilateral intellectual property agreements, jointly with the UPOV (Union for the Protection of New Varieties of Plants), Paris Convention, the Patent Cooperation Treaty, Berne Convention, the Geneva Convention.

Even though the IPR development promotion would prop up the autonomous innovation of the industry, emulating the advanced technology in other countries to dole out as the modernization subjects of China is censored. IPR has become more significant than it was a decade ago as the Chinese economy becomes increasingly driven by exports to other countries.

In the modern age, Global competitiveness is directly linked to the level of technology in goods and services. Studies point out that the higher the growth rate of exports, the higher the level of technology involved in the production of goods and services. China began to build a trade surplus with many nations based upon its low manufacturing costs in the 1990s. It has been able to dictate in low-technology/labor-intensive industries and realizes that in order to continue its growth path in exports, it must move up the ladder into a more technology-intensive goods and services. To address this issue, China must acquire access to advanced technology.

Indeed, "China, like most nations, encourages exports because it sales contribute to a favorable trade balance and can earn United States dollars or other forms of hard currency." While Chinese companies were content to serve as original equipment manufacturers (OEM) for foreign firms a decade ago, they have now moved into high-end technology markets, such as those for cars and regional jets, while seeking to maintain their competitive edge over low-cost products. Thus, some commentators and pundits suggested that China's export-driven economic growth is likely to lead to greater future confrontations with the United States. As Peter Navarro observed, "any comprehensive understanding of the imminent China Wars needs commence with this observation: The economic growth of China is export driven; and the capability of the Chinese to overcome one export market after another, repeatedly in blitz fashion, stems from their expertise to set the so-called China Price."

The aim of the present study is to investigate empirically and analyze the correlation existing between intellectual property rights and competitiveness towards the transformation of Chinese economy in attaining the desired output of building an efficient, sustainable and reasonably thriving society in all respects.

Specifically the study ensure to: (i) determine the empirical relationship on intellectual property rights and the competitiveness: (ii) suggest strategic measures for improving intellectual property rights measures in China.

Furthermore, based on the results of meticulous empirical studies about competitiveness of the global financial markets and its attendant repercussions, it is essential for China to focus on sound, appropriate and timely economic policy. The study contributes to the existing literature in the following: firstly, it provides policies that can enhance the foundations in facilitating solutions to promoting the level of acceptance of IPR in China and other developing economies, especially in the emerging markets (BRICS), alerting International Development Organizations that are assisting developing economies in considering viable strategies to adopt IPR. Secondly, it contributes to the literature by providing an empirical analysis of the current level of Intellectual Property Rights and innovation towards economic growth in China; this will provide an understanding of academics, international organizations and policy makers in stabilizing their economies. Thirdly, it provides a strategy for the development of policies and regulatory on IP. The rest of the paper is structured as follows. Section two offers a transitory institutional background followed in section three by literature review. Section four then explains data collection and research methodology. In section five we present conceptual framework-presentation and analyses. Finally, in section six, we provide recommendations and conclusions.

INSTITUTIONAL BACKGROUND

Country Profile

China is located in Eastern Asia, with its capital city-Beijing and bordered by the East China Sea, South China Sea, Korea Bay, and Yellow sea between Vietnam and North Korea. The country has a total area of 9,596,960 square kilometers, divided into a land area of 9,326,410 square kilometers and water area of 270,550 square kilometers. It is smaller in area as compared to the United States of America. China's total land boundaries is 22,457 kilometers and bordered by Russia to the north east-4139 kilometers, Pakistan-49 kilometers, Nepal-1,389 kilometers, Mongolia-4,630 kilometers, Laos-475 kilometers, Kyrgyzstan-1,063 kilometers, North Korea-1,352 kilometers, Kazakhstan-1,765 kilometers, India-2,659 kilometers, Myanmar-2,129 kilometers, Bhutan-477 kilometers, Afghanistan-91 kilometers and extended to Russia,

north west-401 kilometers, Tajkistan-477 kilometers, Vjetnam-1,297 kilometers, and regional borders: Macau-3 kilometers and Hong Kong-33 kilometers. Its current population (2015) is estimated over 1.4 billion based on United Nations projections with an average annual growth rate of 0.49 percent in 2013, according to the World Bank.

Description of Intellectual Property Rights in China

China being among the most innovative investors adopted the western intellectual property rights together with the confirmation of the Accordance on Trade Relations with America (the "Trade Relations Agreement") on July 7, 1979. The agreement reads: "each party shall pursue, under its laws and with due respect to global practice, to pledge to legal or normal persons of the other party fortification of patents and trademarks alike to the patent and trademark protection harmoniously conferred by the other party."In the ensuing year, 1980, China in the long run entered as a representative of the World Intellectual Property Organization (WIPO) and in the subsequent four years, 1984, she abruptly turns out to be an affiliate for the protection of Industrial Property in the "Paris Convention". This led to China's endorsement of basic IP laws such as the Patent, copyright, unfair competition and the Trademark Act respectively. Before then, the trade of fake consumer goods is as cost-effective as it is all-encompassing. Yiwu, a city in China is well thought-out as the capital of counterfeit. According to experts, the probability of selling fake consumer goods in Yiwu is at least 0.9 or 90 %. The experts further stressed that Yu Bao Lu, a facility in Yiwu consists of 300 private showrooms, and the entire showrooms are factories concentrating in counterfeit drugs. "Treasure Street" in Beijing, the capital of China hosts an outdoor counterfeit market. Honkong's Commercial Trading Service Businessman, Tony Gurka assert that: if a company is convinced that the products are genuine, then either they are dreadful products or copied. Items that are prey of counterfeiting include Gillette's razor blades, Dura cell batteries, Rolex watches, Head and Shoulder's Shampoo and Safeguard soap. Factually, owner-creators were less protected by Property laws of China as compared to western laws. Following the Paris Convention of Article 4, the Provisional Regulations Governing Application for Priority Registration of Trademarks were enacted by the Chinese government in China to permitting the right of priority to trademark applications surrendered to the PRC by member countries nationals of the Paris Convention. The Trademark law of 1982 was based on a first-to-file basis. Under this law, registered, trademarks have a life span of ten years after approval, with a regeneration option of ten years. United States (U.S.) laws, on the other hand, discard a first-to-file system. The inventor's creation is protected as long as there is evidence that he or she first completed an invention; regardless of the time, they file the agreement. The Patent law like the Trademark law operates on a first-to-file basis. Article 9 of

the Patent law reads: "wherever two or more file applications for patent for the indistinguishable invention-creation, the patent right shall be certified to the interviewee whose submission was streamed earliest." Trademarks and patents that are well recognized are protected by the Chinese laws whilst new or unknown trademarks are complex or unfeasible to protect. Furthermore, the Chinese laws accepted exclusively socialist flavor most clearly seen within the confines exerted by the government on the rights approved by the patent and trademark laws. The patent law of 1984 established patent protection to "job-related invention-creation" to encourage innovation and to stimulate the growth of science and technology, but it restricted patent ownership in the work unit, the joint venture, or enterprise. These unique laws were narrowly tailored and reinforced because they could be used only to "promote socialist legality with Chinese characters." The state-run Development Research Centre in 2002 values US$16 billion as the nation's counterfeiting industry.

The copyright agreement is the author's lifespan plus 50 years, nonetheless, for the works created by a company or organization, photographic and cinematographic works, the duration is 50 years for next publication. The PRC adopted and promulgated the Copyright Law in 1990 and adopted the Implementing Rules in 1991 and revised in 2002. These have given extraneous copyright holders security for their rights and comforts in the PRC.

The Role of the Chinese Government in sustaining Intellectual Property Rights

The WTO incorporated China as one of its members in December 2001. Just proceeding to entry into WTO, it took radical steps towards making the fake trade a historic entity so as to mitigate and eradicate the risk of default in adhering to trade compliance. It is as a result of this that it passed a lot of new patent, trademark and copyright laws. These laws produced a lead up restriction source of exploit for victims as they are normally obligatory constitutional costs or intellectual property violations, provided for greater legal review and strengthen China's intellectual property that would be recognized and secured. Since then, PRC has articulated and continues to make headway in reviewing, modernizing and adopting new laws in the implementation of intellectual property rights to end the flow of counterfeit products keeping risk at a lower ebb to fulfill the WTO Agreement on Intellectual Property Rights on Trade Related Aspects (TRIPS) and safeguard its own local markets, PRC continues modifying its legal framework system that will endow with a conducive atmosphere for the socio-economic growth and development of the country. The PRC Supreme Court is the country's premier court and has remarkably embarked to lecturing and training on WTO courses, rules, statutory and prudential requirements. Furthermore, Researchers and Senior Legal Officers like judges have been sent overseas to capacitate themselves in Patent laws and practices in developed

countries like the U.S. and the United Kingdom. Laws and regulations are being modified, wiped out, or restored by new legislation if they do not contest to WTO standards. Much attention has been focused on intellectual rights as the fight against violation continues to wage on. An established patent by-laws titled "Opinions Concerning the Determination of Patent Infringement" was released by the Beijing High People's Court in 2001. Wang Zhengqing, who was the court vice-president reaffirmed that the one hundred and twenty nine entries established as new rules would encompass patent protection to the entire the fields. A reviewed set of strategies that incorporated the court's know-how on deciding intellectual property matters over the previous era was bestowed in late 2013 by the Beijing High People's Court. In the subsequent year, Guangzhou, Shanghai and Beijing courts were approved as specialized courts by the National People's Congress Standing Committee for IPRs. (World Trade Organization Website: www.wto.org.).

According to Wang Zhenqing (2006), the Supreme People's Court IP division deputy presiding judge, the new courts are imperative insurgency of the country's jurisdictional system and will stimulate the growth of China's evolving industries, (World Trade Organization Website: www.wto.org.). On November 6, 2014, Beijing opened its doors and established its first specialized courts encompassing two hundred cases and over twenty-five judges. The Intellectual Property Court of Guangzhou has ten judges and the hearing cases started on January 4, 2015 and presently. Moreover, on January 4 2015, the Shanghai Intellectual Property Court with fourteen judges, which has been the most recently, established specialized courts started hearing cases. The new-fangled courts give ruling on local and government cases connected to copyrights, trademarks, patents, technology secrets and computer software as indicated by the Supreme People's Court. To circumvent contradictory rulings and boost gaining expertise in this vital field, the trial and transitional courts in Guangzhou, Beijing and Shanghai will steadily surrender rule of intellectual property rights cases to the new courts (Global Times, published 2014-11-4)

LITERATURE REVIEW

Competitiveness

Competitiveness is a concept of static and dynamic components. It can be referred to as the ability and performance of a set of institutions, factors and policies that agree on the level of production to sell and supply commodities of a country in a given market with prosperity on its agenda. Even though the output of a country determines its capability to endure a pronounced level of income, it is correspondingly amongst the vital determinants of its returns to investment, which is a fundamental factor in explaining the growth potential of an economy (Wikipedia).

Global Competitive Indexes-World Economic Forum (WEF) Approach

WEF, headquarters in Geneva is an autonomous global organization that is unswerving in providing benchmarking tools for business leaders and policy makers in identifying obstacles that improve competitiveness and stimulate deliberations on strategies. The round-table meets every twelve months in Davos, a mountain resort in the eastern Alps region in Switzerland. The meeting brings collectively some 2,500 top business leaders, selected intellectuals, international political leaders, and journalists, for a winter meeting to discuss pressing issues facing the world (The Global Competitiveness Report 2014-2015). This congregation serves as a podium to identify meetings, participation and participants with such phrases "a Davos panel". WEF efforts with another institution (IMD) was to carry out research project on worldwide competitiveness measurement. The two institutions (WEF and IMD) started their independent schemes in publishing yearly reports since 1996.The Global Competitive Index (GCI) methodology adopted by WEF is an extremely inclusive device that deals with the microeconomic and macroeconomic fundamentals of national competitiveness. It is composed of 12 categories or pillars as shown in figure below. The categories are grouped into three classes of key determinants for measuring global competitiveness of selected countries. The data sourced by WEF are mainly from statistical data such as budget deficit, life expectancy, enrollment rates and government debt, which are in turn obtained from credible international agencies and international organizations such as the International Monetary Fund (IMF), the United Nations (UN) and the World Bank and from its own annual Executive Opinion Survey. The Survey captures very useful information on a broad range of economic and social factors, for which data sources are non-existent, too scarce, unpredictable, or outmoded. The Survey captured the opinions of over 13,000 business executives in 2014.

Computation and structure of the Global Competitiveness Index 2014-2015

This appendix outlines the composition of the Global Competitiveness Index (GCI) [World Trade Organization Website: www.wto.org]. The Indicator numbering corresponds with that of the data tables. For example, indicator 1.11 belongs to the 1st pillar whilst indicator 9.04 represents the 9th pillar. The GCI computation is based on consecutive cumulative of scores from the indicator level to the overall GCI score. The arithmetic mean is used to amass individual indicators within a class. Furthermore, percentages are used to compute for higher aggregation level. The percentages reported are estimated to the nearest whole number and represent the category's weight with respect to the parent category. The weight assigned to the three sub-indexes (innovation and sophistication factors, basic requirements, and efficiency enhancers) is not fixed for higher levels unlike the case of the lower levels.

Figure 1. Detailed Structure of the GCI
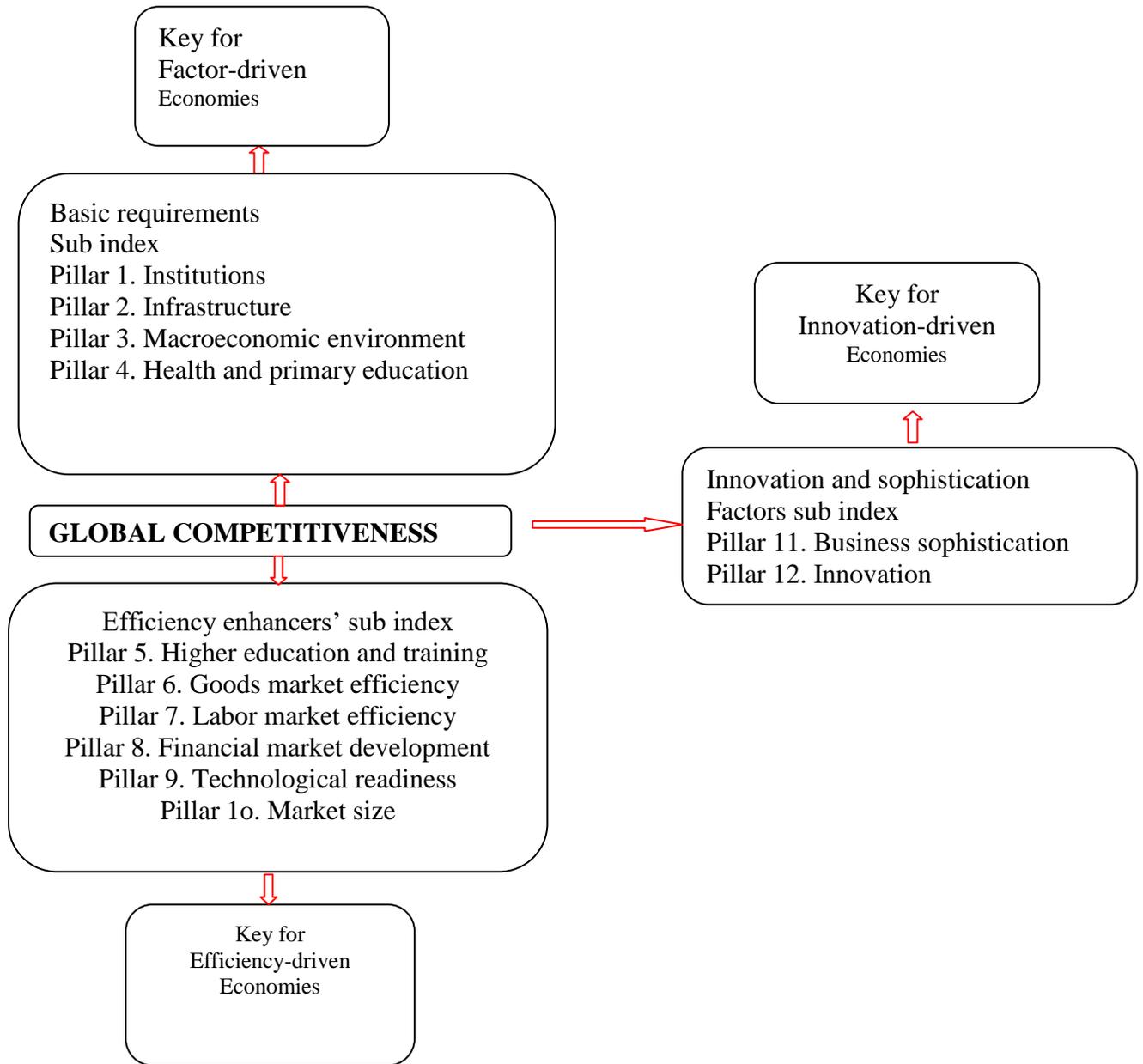
Source: WEF

Shaping the intensity of competitiveness is a precondition in the manipulation of competitiveness on Hi-Technology and IPP. Porter (1979) identifies five sources of competitive intensity in an industry that determines a firm's performance (barriers to entry, threat of substitutes, competitive rivalry, bargaining power of customers, and bargaining power of suppliers). Brown and Kimbrough (2011) find that the degree to which a firm's earnings co-vary with industry earnings is negatively related to the firm's level of specialized indescribable assets

(e.g. legal contracts, copyrights and patents). Dedman and Lennox (2009) survey private firm managers in the UK and find no relation between the managers' perceptions of their competitive environment and the industry concentration ratio. Glen et.al (2001) show that competition in numerous developing countries has been elevated than is generally thought. Their study finds that the doggedness of proceeds in preferred emerging markets is with a reduction of that reported for developed economy markets. This implies that emergent country product markets are at least as competitive as those in advanced countries and imply that competition by itself is not necessarily adopting a stringent competition policy in developing economies. Conversely, Glen and colleagues do not directly investigate what impact such an unpredictable high level of competition has had on productivity growth or what the source of such competition is.

Competitiveness and Intellectual Property Rights

As IP stimulates R&D expenditures which creates a catalyst for innovation, firms are expected to have higher sales output and are expected to strengthen their competitiveness in global markets. IPR aims to inspire technology flow and innovation by protecting the happiness of creators using suitable policies.

Kanwar and Evenson (2003) in a country-level study analyzed R & D expenditures in twenty-nine countries. They noted the disparity in terms of patent protection across countries, with the range of innovations suitable for compulsory licensing, patent enforcement, patent duration, patent protection, and opportunities for opposition.

They concluded that intellectual property protection is positively and significantly associated with R & D using regression analysis.

Hall and Ziedonis (2001) focus on patenting in the U.S. semiconductor industry .They explore the strengthening of patent policies of the 1980s using quantitative analysis of firm-level data on R & D and patenting and industry interviews. They found that large-scale manufacturers appear to be engaged in "patent portfolio races."

Despite the consequences of the reimbursement to poor consumers of low-cost product knockoffs, Maskus, et al,(2004) field research in China recommended that market saturation by unauthorized goods diminished the available range of legitimate goods

Gould and Gruben (1996) investigated economic growth rates across many countries to a simple index of patent strength and other variables. They discovered a momentous positive effect when patents were networked with a degree of openness to trade. That is, growth increases by 0.66% on average due to the impact of stronger patents in open economies, suggesting that market liberalization in recipe with stronger IPRS increases growth. Park and Ginarte (1997) investigated the influence of IPRs on Growth and Investment. They found a

strong correlation of patents on substantial savings and R&D expenses, which in turn enhanced growth performance. Borensztein, De Gregorio, and Lee (1998), revealed that FD had an appreciably positive impact on growth, save for only in countries that had attained a verge level of secondary education within their populations.

Cincera (1997) investigated the relationship between R&D and Patent applications using a sample of 181 firms belonging to the group of the most important international firms. Results showed that R&D expenditure are positively correlated with patent behavior. R&D increase of 10 percent leads to 3.5 percent increase of patent application within the same year. The findings also showed that technological spillovers measured by R&D in other firms had a positive impact on patent applications. Smith (2001) examined the simultaneous impact of IPR protection on United States exports, affiliated sales and licenses to unaffiliated foreign firms in a sample of 50 developed and developing countries using a variant of the gravity equation. Results suggested that strong IPR protection increases the benefits of locating abroad and leads to increase in affiliate sales and licensing relative to exports, particularly in countries with strong initiative abilities. Falvey et al. (2006) examined the impact of IPRs on economic growth using panel data for 80 countries. Findings of the study showed that, IPRs are positively and significantly correlated for low- and high-income countries but not for middle-income countries. McCalman (20050) tested the endogenous model for 27, most developed countries. Findings of the study showed that, in the short run majority of the country loose due to a distribution of wealth to foreign owners of technology.

However, in the long run, when the TRIPS provided incentives to research efforts, all countries benefit. Patricia Hiqino Schneider (2005) investigated the role of high-technology, IPRs and FDI in determining a country's rate of innovation and economic growth by employing a unique panel data set of 47 developing countries from 1970 to 1990. The results are broadly consistent and suggested that: (1) hi-tech imports are necessary in explaining domestic innovation both in developing and developed countries; (2) the per capita GDP growth has a stronger impact on foreign technology.; (3) IPRs has a significant impact in developed countries in terms of innovation; (4)However, FDI results are in conclusive. Ryuhei Wakasugi and Bari Ito (2007) focus on the effects of stronger IPRs on Technology Transfer: Evidence from Japanese Firm-Level Data. Their findings revealed that robust protection of IPRs has a positive effect on the advancement of intra-firm technology transfer.

Based on the overall literature review, there still remain gaps in relation to IP (Intellectual Property). However, facilitating an inclusive study of the literature review is a motivation to undertake the given study.

METHODOLOGY

Data Collection

This study adopts a quantitative approach that aims to investigate the impact of Intellectual Property Rights of China on its Competitiveness at Country-Level Perspective using a secondary data set collected from Organization for Economic Cooperation and Development (OECD), China Statistical Yearbook and World International Property Organization (WIPO) for the period 1988-2013. The purpose of choosing within the period (1988-2013) to our analysis is because access of data from secondary source was challenging and also noting the fact that China has only lately joined the WTO and is still adjusting to adhere to the WTO statutory and prudential requirements compliance. The research findings of this study if used as a proxy by policy makers and implemented will improve income and better standard of living for human livelihood that ultimately leads to a sustainable economic growth and development for global competitiveness.

Research Approach

The Ordinary Least Square (OLS) econometric technique was used as an estimate for the model. The model was chosen based on the fact that OLS is best suited analysis that involves testing the nature of economic relationship in testing specific hypothesis (Guajarati 2004). Variables of the properties of the time series were tested in the process. To estimate the economic impact of IPRs on competitiveness, we use Revealed Comparative Advantage as a measure for competitiveness. The methodology connects an econometric model in which the key macroeconomic elements of IPR of China on its competitiveness at country level perspective. In this study, multiple linear regression models were used to estimate the relationship between IPR and its potential macroeconomic elements. Thus the model specification is adopted to take the following specification:

RCA = F(GDP, RD, EXR, HK, HDC, IPR)   (1)

From equation (1), the econometric form of the equation is

$RCA_t = \delta_0 + \delta_1 BGDP_t + \delta_2 RD_t + \delta_3 EXR_t + \delta_4 HK_t + \delta_5 HDC_t + \delta_6 IPR_t + \mu_t$ (2)

Where,

RCA= Revealed Comparative Advantage, GDP= Real Gross Domestic Product, RD= Research and Development, EXR= Exchange Rate, HK= Level of Human Capital Stock, HDC = Real Export level of goods, IPR = Intellectual Property Rights, μ_t = Error term and t = Time

δ_0 is a constant and δ_1 to δ_6 are the coefficient parameters to be estimated.

ANALYSIS AND DISCUSSION OF RESULTS

The empirical investigation commences with an analysis of the unit root test. This is so because the unit root test is conducted to check data stationarity. This step is very vital because if non-stationary variables are not identified and used in the model, it will lead to a problem of spurious regression. The results suggest that there is a statistically significant and meaningful relationship amongst the variables in the stated regression model where in actual fact all that exists is contemporaneous correlation rather than meaningful causal relationships. The Augmented Dickey-Fuller test was carried out and the test results are presented in table 1.

Table 1. Unit Root Test (E-views output)

Variable	Level/Δlevel	Calculated ADF	ADF Critical	Inference
RCA	Level	-2.137332	-3.243079	I(1)
	Δlevel	-3.370587	-3.243079*	
GDP	Level	0.071178	-4.394309	I(1)
	Δlevel	-4.940445	-4.440739***	
RD	Level	-1.657898	-4.374307	I(1)
	Δlevel	-4.982730	-4.394309***	
EXR	Level	-1.489738	-4.374307	I(1)
	Δlevel	-5.725247	-4.394309***	
HK	Level	-1.657327	-3.603202	I(1)
	Δlevel	-4.127478	-3.612199**	
HDC	Level	0.446927	-1.955681	I(1)
	Δlevel	-2.204611	-1.955681**	
IPR	Level	1.581696	-3.632896	I(1)
	Δlevel	-4.028148	-3.632896**	

Note: ***, ** and * indicates that the variable is stationary at the 0.01, 0.05and 0.1 level of significance respectively

From Table 1, all the variables in the model are non-stationary at their levels but stationary at first difference denoted as I(1). This suggests the use of co-integration analysis since the concept of co-integration requires the variables to be stationary after differencing at least once.

Co-integration Test Analysis

The stationary linear combination is termed the co-integrating equation and can be infer as a long run equilibrium relationship between the variables. The common objective is to determine the most stationary linear combination of the time series variables under consideration.

Consequently, Johansen and Juselius (1988, 1990) co-integration technique was employed in order to investigate the stable long-run relationships between RCA, GDP, EXR, HK, HDC and IPR in China by using both the Trace and Maximum-Eigen tests statistics. The results are presented in Tables 2 and 3.

Table 2. Trace test statistics

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.986300	305.8293	125.6154	0.0000
At most 1 *	0.909275	202.8610	95.75366	0.0000
At most 2 *	0.854189	145.2630	69.81889	0.0000
At most 3 *	0.827953	99.05227	47.85613	0.0000
At most 4 *	0.728948	56.81253	29.79707	0.0000
At most 5 *	0.638888	25.48185	15.49471	0.0011
At most 6	0.042257	1.036218	3.841466	0.3087

Trace test indicates 6 cointegrating eqn(s) at the 0.05 level, * denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) p-values

Table 3. Maximum Eigen test statistics

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.986300	102.9683	46.23142	0.0000
At most 1 *	0.909275	57.59803	40.07757	0.0002
At most 2 *	0.854189	46.21071	33.87687	0.0011
At most 3 *	0.827953	42.23974	27.58434	0.0003
At most 4 *	0.728948	31.33068	21.13162	0.0013
At most 5 *	0.638888	24.44563	14.26460	0.0009
At most 6	0.042257	1.036218	3.841466	0.3087

Max-eigen value test indicates 6 co-integrating eqn(s) at the 0.05 level, * denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) p-values

The results of both the trace test in Table 2 and the maximum-eigen test in Table 3, indicates that co-integrating equation exists at the 1%, 5% and 10% significance level respectively. Therefore the null hypothesis of no co-integrating equation is rejected. Consequently, it can be concluded that there is a significant long run equilibrium relationship between the given variables

Table 4.Normalized co-integrating coefficients (standard error in parentheses)

RCA	GDP	RD	EXR	HK	HDC	IPR
1.000000	2.39E-13	-2.320417	0.042631	-0.050088	-0.007594	4.05E-07
	(4.5E-14)	(0.21668)	(0.01066)	(0.01156)	(0.00317)	(5.3E-08)

The result of the long-run Revealed comparative advantage equation indicates that China Total Trade Export and Revealed Comparative Advantage have negative effects on Chinese Research and Development, level of human capital and real export level of goods in China while Real gross domestic product, exchange rate and intellectual property rights have positive effects on Revealed comparative advantage. The elasticity shows that Revealed comparative advantage in China is more positively responsive to Intellectual property rights than real GDP and exchange rate. The Chinese Revealed comparative advantage elasticity for real GDP, RD, EXR, HK, HDC, and IPR are 2.39,-2.32, 0.04, -0.05, -0.01 and 4.05 respectively (Table4).

Table 5. Regression Output. Dependent variable RCA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.020588	0.039567	0.520338	0.6095
D(GDP)	8.06E-13	2.35E-13	3.432625	0.0032
D(RD)	-1.102981	0.361719	-3.049277	0.0073
D(EXR)	-0.066709	0.027670	-2.410901	0.0275
D(HK)	-0.067866	0.033747	-2.011026	0.0605
D(HDC)	0.037355	0.012185	3.065519	0.0070
D(IPR)	-6.28E-07	2.41E-07	-2.604828	0.0185
ECM(-1)	-0.743895	0.185422	-4.011914	0.0009

R-squared = 0.6743, Adjusted R-squared = 0.5401, F-statistic = 5.0272, DW stat. = 1.9918

The coefficient of GDP 8.06E-13 is positive and has a significant impact on RCA. This finding is in conformity with theories and findings from previous studies that there exists a positive relationship between them. The result also reveals that HDC is positively related to RCA in China, and is statistically significant. If HDC is increased by 1%, RCA will increase by 3.7%.However, the results for RD, EXR, HK and IPR were found to be statistically significant for the study with negative impact on the RCA in the country. The coefficient of the error correction term indicates the speed of adjustment in eliminating deviation from the long run equilibrium. It shows how much time would be taken by the economy to reach at long run equilibrium. Its coefficient is statistically significant -0.743895. This shows that the speed of adjustment is approximately 0.74% implying that if there is a deviation from the equilibrium, approximately

0.74% of RCA is corrected annually as the variable moves towards restoring equilibrium. The adjusted R- squared (R^2) value is 0.5401, implying that approximately 54% of the variation in the RCA is explained by the independent variables, which is an indication of a very good fit. The Durbin-Watson statistic is high suggesting that there is no first order auto-correlation.

Diagnostics and stability test results

Diagnostics and stability tests were also conducted to ascertain the robustness of the model used. The test results are reported in table 6.

Table 6. Diagnostic test results

Test	Type	Null Hypothesis	Statistic	Probability	Inference
.	Breusch-Godfrey L.M	No serially correlated errors	F-statistics = 4.2214	Prob. Chi-Square = 0.111	Fail to reject Ho
Normality	Jarque-Bera	Errors are normally distributed	Jarque-Bera Statistics = 1.3244	Probability = 0.5157	Fail to reject Ho
Heteroskedasticity	Breush-Pagan-Godfrey	Homoscedasticity	F-statistics = 0.8790	Prob. Chi-Square = 0.4669	Fail to reject Ho
ARCH	F-Statistic	ARCH effect does not characterize model's errors	F-statistics = 1.2830	Prob. Chi-Square = 0.2501	Fail to reject Ho
Functional Form Misspecification	Ramsey RESET	Model is correctly specified	F-statistics = 0.0276	Probability = 0.8702	Fail to reject

To establish the goodness of fit of the predictable model, the diagnostic test was conducted. The model does not suffer from the problems of non-normality of the errors, serially correlated errors, ARCH effect, heteroskedasticity and functional form misspecification which can be seen from all the probability values greater than 5%. With regards to stability test, the results of both the CUSUM and CUSUMQ plots lie within the 5% critical band width which confirms the stability of the coefficients and the correct specification of the model.
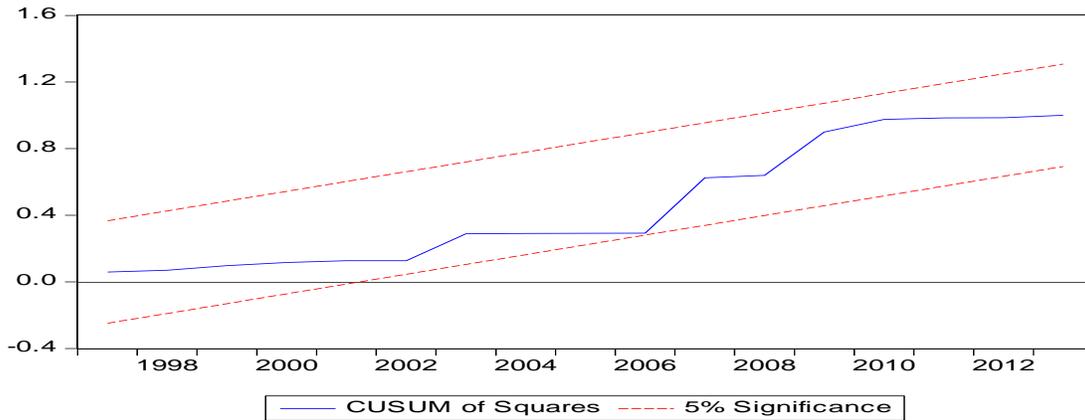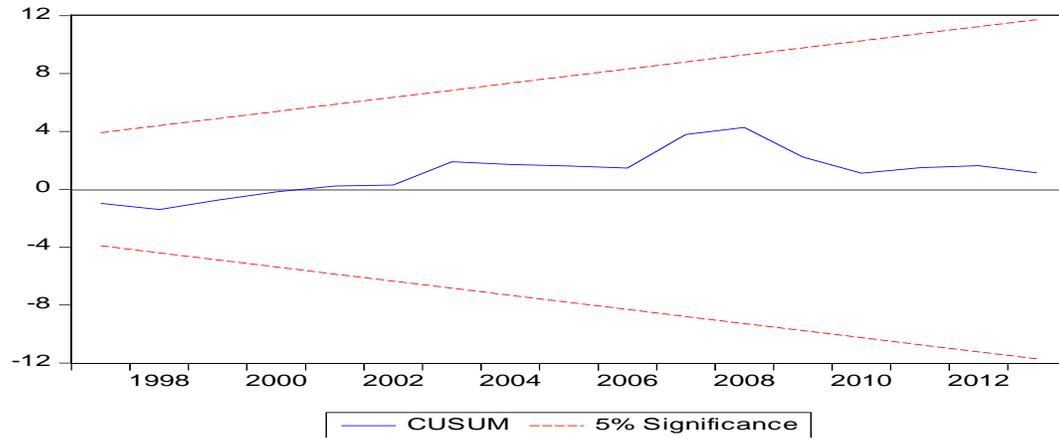
Table 7: Result of the correlation matrices

	lnEXR	lnGDP	lnHDC	lnHK	lnIPR	lnRCA	lnRD
lnEXR	1						
lnGDP	0.42	1					
lnHDC	0.48	0.65	1				
lnHK	-0.27	-0.67	-0.52	1			
lnIPR	0.43	0.68	0.57	-0.67	1		
lnRCA	0.44	0.69	0.64	-0.64	0.66	1	
lnRD	0.25	0.62	0.60	-0.67	0.63	0.55	1

The result of the correlation matrices provided in table 7, shows the correlation between the Intellectual Property Rights (IPR) and the growth of output with regards its competitiveness for the Chinese economy. The result also indicates that the IPR is negatively correlated with the level of Human capital stock(HK) which signifies that (IPR) has a negative functional relationship of inverse proportionality with the variable (lnHK) suggesting that as (IPR) increases human capital stocks(lnHK) reduces. However, (lnIPR) is positively correlated to

lnEXR, lnGDP, lnHDC, lnRD and ln(RCA) implying that the (lnIPR) moves in the same direction with these variables indicating a positive functional relationship of direct proportionality. The results also reveal that there is no high correlation between the variables; which implies that there is no detection of multicollinearity.

CONCLUSION

The study investigates empirically the key determinants to Intellectual Property Right in the event of innovation, sustained economic growth and development in China economy using 1988-2013 secondary data collected from the; World International Property Organization (WIPO), Organization for Economic Cooperation and Development (OECD) and data from Government policy documents and was analyzed using unit root tests, co-integration and error correction model technique. The study acknowledges the fact that the growth accelerator principles of IPR is responsible for the growth rate of investment in Innovation and the level of human capital stock. The creation of IP is a key factor in sustaining economic growth and achieving high living standards, a finding that is consistent with the current work. The following results are drawn from the above analyses of this paper:

First, there is a significant long-run relationship between the given variables as results from trace test and the maximum-eigen test indicate that co-integrating equation exists at the 1%, 5% and 10% significance level respectively. Therefore the null hypothesis of no co-integrating equation is rejected.

Second, the coefficient of GDP (β_1) 8.06 has a positive and significant impact on RCA. This means that a 1% increase in GDP leads to approximately 8.06% increase in RCA indicating a direct proportionality though the margin of increase differ.

Third, the result also reveals that HDC is positively related to RCA in China, and the variable is statistically significant.

However, the results for RD, EXR, HK and IPR were found to be statistically significant for the study with negative impact on the RCA in the country indicating an inverse proportionality. A feasible reason for this is because China has only lately joined the WTO and is still adjusting to adhere to the WTO statutory and prudential requirements compliance. The results also reveals that the IPR is negatively correlated with the level of Human capital stock(HK) and positively correlated to EXR, GDP,HDC, RD and RCA.

This may indicate that although IPRs laws have been in place by administrative protocols, government order, and decrees in the areas of patent, trademark and copyright but they are not well enforced nor are the penal charges and punishments significant enough to deter piracy subjecting the IPR system to risk.

POLICY RECOMMENDATIONS

Some input economic policy implications are stimulated by the above results:

With the growing importance of knowledge as a driving force for innovation and economic expansion worldwide, the protection of IPRs has attracted greater attention and concern. The challenge for policy makers is therefore to continue encouraging investment in R&D and human capital in order to develop the policy instruments and legal framework to better protect IPRs by keeping risk at a lower ebb. Government should adopt Policies that enhance law enforcements ability to detect, investigate, and prosecute IP theft are essential for better protecting IPRs. The protection of IPRs will require the effective strengthening of sound national policies, as well as the international coordination of effective and efficient policies and enforced legal framework in such forums as the World Trade Organization.

Moreover, if the intellectual property system is to be welfare-enhancing, China needs to put in place rectification mechanisms or preserve actions to warranty a correct balance linking proprietary interests and public access needs. If such mechanisms do not exist, the intellectual property system could create significant damage to the country when the system goes out of balance.

Also, but very necessary to embark on training, workshops and awareness program because Without adequate education with regard to IPRs policies and legal framework, there is little awareness that infringement is a crime and some defaulters will keep on doing the same thing innocently.

Finally, policy makers should review the old policies and laws and come out by formulating and implementing an effective industrial strategy backed with IPRs risk management policy and drawing on successful lessons from other countries/ regions as a proxy to mitigate risk and enhance IPRs performance.

Government policies have an important role to play in determining the long- run growth rate of the country's economy concluding that IP directly affects economic growth by making individual workers more productive; and indirectly leading to the creation of knowledge, ideas and technological innovation.

Future research direction could be the nexus between the performance of competitiveness sector and Economic growth in China. This failure of interaction between RCA and RD, EXR, HK and IPR can be investigated for further studies.

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