



INTELLECTUAL PROPERTY REGIME AND INDIA AS A KNOWLEDGE ECONOMY

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ABSTRACT

It is often said that India is moving towards knowledge economy. There are various definitions of knowledge economy but one thing is sure that the next era will continue to be a knowledge era and the economic prosperity of a country or a firm will be closely linked with its knowledge capital stock. There are various ways of describing a knowledge economy like number of knowledge workers, knowledge sectors, knowledge industries and so on. But one thing is sure that the stock of knowledge cannot be definitely measured and yet it's widely accepted measurement yardstick is Intellectual property and patents filed by a country or a firm.

As noted by Walter W. Powell and Kaisa Snellman, "We define the knowledge economy as production and services based on knowledge-intensive activities that contribute to an accelerated pace of technical and scientific advance, as well as rapid obsolescence. The key component of a knowledge economy is a greater reliance on intellectual capabilities than on physical inputs or natural resources."

This paper examines the Indian capabilities and efforts towards creating the knowledge capital through filing and getting patents, trademarks, or intellectual property rights, industrial designs etc. If India is moving towards the knowledge economy then its place as compared to that of other countries in the world also matters. Not only the advanced and developed economies but also the emerging economies with similar GDP and growth rates are moving towards knowledge economy, then we have to examine the relative speed and position of India in this regard.

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INTRODUCTION

Indian economy is one of most promising economy in the world. In 2014 the Asian Development Report predicted that India can become a Knowledge Economy. As the report says, "India, with its youthful population and thriving information and communication technology (ICT) industry, can become a leading knowledge-driven economy as long as regulatory, education, and infrastructure barriers are overcome," ADB said in its report 'Innovative Asia: Advancing the Knowledge-Based Economy' published in September, 2014. The Report also has thrown light on the measures and description of knowledge economy. As per the report, 'A knowledge-based economy describes an economy that uses information resources-technologies, skills, and processes-to achieve and accelerate economic growth potential. This report adopts the following definition which combines World Bank and OECD descriptions: A knowledge-based economy is one that has an economic incentive and institutional regime that stimulates the acquisition, creation, dissemination, and use of knowledge and

information to improve its growth and welfare, as well as effective systems of education and skills, information and communication technology (ICT), research and development (R&D), and innovation. Further the World Bank has developed a Knowledge Index and calculated on the basis of the four pillars such as Economic incentive and institutional regime, Education and skills of population, Innovation and technological adoption system, Information and communication technology infrastructure. Each of the four pillars has Rationale and indicators. As mentioned in the report they are given below.

KAM (Knowledge Assessment Methodology)-Basic Scorecard Variables

Performance

Average annual GDP growth (%)
Human Development Index

Economic incentive and institutional regime

Tariff and nontariff barriers
Regulatory quality Rule of law Education and human resources Adult literacy rate (% age 15 and above)
Secondary enrollment Tertiary enrollment

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Innovation system

Researchers in R & D, per million populations
 Patent applications granted by the USPTO, per million populations
 Scientific and technical journal articles, per million populations

Information infrastructure

Telephones per 1,000 persons (telephone mainlines + mobile phones)
 Computers per 1,000 persons
 Internet users per 10,000 persons

Note: The World Bank developed the Knowledge Economy Index (KEI), an indicator of the knowledge economy based on these four pillars and uses that index to benchmark economies. Source: World Bank Knowledge Assessment Methodology and Knowledge Economy Index.

This indicates that while calculating knowledge index of various countries innovation and R&D has been given important place. Hence it will be appropriate to make use of the IPR and Patents to determine Indian economy’s journey towards attainment of the status of a Knowledge Economy.

Objectives: The main objective of this paper is to discuss the essentials of Knowledge Economy and India’s efforts and results in knowledge economy journey. The important element of knowledge based society is the Intellectual capital or intellectual property that the people in the country create. The objective is to examine the relative position of India in this regard. It is determined via the number of patents files and granted, industrial design applications and design registrations and Trademarks registrations.

Literature Reviewed: The starting point of this paper was the Asian Development Bank’s (ADB) report on the ‘Innovative Asia: Advancing The Knowledge-Based Economy’ *The Next Policy Agenda*, published in 2014.

The literature reviewed is mainly for three purposes. One is for definition of knowledge economy, for studying the determinants of knowledge economy used by various scholars for various objectives. Second literature is reviewed for determining whether, Intellectual Property Rights, patents, trademarks can be used as an indicator knowledge capital and knowledge economy determinant and then determine the condition of Indian economy in this regard. Innovation and its role in economic development is already accepted in economic literature, but here the efforts are to assess the knowledge economy position of our country by making use of IPR and related statistics.

Though Knowledge Economy has been considered as a result of latent variables and its determinants are unobservable a study has been conducted by Frank G. van Oort · Johan H. L. Oud, Otto Raspe, entitled, ‘The urban knowledge economy and employment growth: a spatial structural equation modeling approach’ published online in March, 2009. They have come to the conclusion after their study of three latent variables i.e. R&D-intensity, innovativeness and ‘density of knowledge workers, that the latent variables of ‘density of knowledge workers’ and ‘innovativeness’ have significant positive and strong impacts on employment growth.

The economic development has been a continuous process of change. All over the world the countries and economic agents try to bring out positive results from this change. Innovations and Research are the foundations of these changes, and the change agents try to get maximum returns from these innovations. As note by David J. Teece in *Capturing Value from Knowledge Assets*’ published by California Management Review Vol 40, No, 3 SPRING 1998. WalterW. Powell and Kaisa Snellman, have also noted that there is a transition from emphasis on use of natural resources to use of knowledge resources. To quote, ‘We document this transition with patent data that show marked growth in the stocks of knowledge, and show that this expansion is tied to the development of new industries, such as information and computer technology and biotechnology. The literature on the knowledge economy focuses heavily on knowledge production, however, and attends less to knowledge dissemination and impact.’ (Annu. Rev. Sociol. 2004.) Further they have measured the acceleration in knowledge production. The paper quotes that, ‘A challenge for social science has been to find metrics to gauge the extent to which society has become more dependent on knowledge production. Although there is wide recognition of the importance of knowledge and intangible capital in fostering economic growth and social change, devising useful measures of these assets has been difficult. One focus has been on stocks of knowledge-human, organizational, and intellectual capital, while another focus has been on activities-R&D efforts, investments in information and communication technology and in education and training, and organizational reforms. Patents have become a widely used indicator of intellectual capital (Grindley & Teece 1997) and economically valuable knowledge (Pakes & Griliches 1980, Griliches 1990).

Taking up the same line forward, in this paper the condition of India in the Knowledge Economy is measured in terms of patents applied, patents granted, industrial designs, trademarks etc.

METHODOLOGY

The World Intellectual Property Organization publishes data of almost all the countries with respect to various aspects such as Patent applications, Patents granted, industrial designs, Trademarks etc. which has been used and it is compared against the GDP of the country. The GDP data published by IMF in their world economic outlook is used here. This paper attempts to examine the ranking of various countries in terms of its GDP and as against its ranking terms of Patents granted. The main purpose here is to examine whether the countries with higher GDP are creating more knowledge capital as compared to low GDP countries? Whether it is essential for a country to create more knowledge wealth in order to become developed and High Income Group country? The data for this purpose is presented below:

Table 1:

TOP 12 Countries In The World In Their Gdp Ranking: 2017 and 2016 ranks

Sr. No	Name of the country	GDP Nominal (billions of \$) 2017	Rank	GDP Nominal (billions of \$) 2016	Rank
1	United states of America	19,417.144	1	18,561.93	1
2	China	11,795.297	2	11,391.62	2
3	Japan	4,841.221	3	4,730.30	3
4	Germany	3,423.287	4	3,494.90	4

5	UK	2,496.757	5	2,649.89	5
6	India	2,454.458	6	2,250.99	7
7	France	2,420.440	7	2,488.28	6
8	Brazil	2,140.940	8	1,769.60	9
9	Italy	1,807.425	9	1,852.50	8
10	Canada	1,600.265	10	1,532.34	10
11	Russia	1,560.706	11	1,267.75	12
12	Korea	1,498.074	12	1,404.38	11

Source: International Monetary Fund World Economic Outlook April 2017
<http://www.imf.org/en/Publications/WEO/Issues/2017/09/19/world-economic-outlook-october-2017>.

As compared to 2016 India and Brazil's rank shows an upward projection in 2017. Same is with Russia while USA and China have retained their positions in GDP. Now if we assume that the resulting rise in the GDP is due to the rising patents received by the companies and individuals of the country then we have to take a look at the following data.

Table 2

Patent applications for the top 10 offices			
Office	Patent applications		
	2014	2015	Growth (%) 2014-15
China	928,177	1,101,864	18.7
United States of America	578,802	589,410	1.8
Japan	325,989	318,721	-2.2
Republic of Korea	210,292	213,694	1.6
European Patent Office	152,662	160,028	4.8
Germany	65,965	66,893	1.4
India	42,854	45,658	6.5
Russian Federation	40,308	45,517	12.9
Canada	35,481	36,964	4.2
Brazil	30,342	30,219	-0.4

Note: Application numbers are a sum of direct filings and PCT national phase entries received by offices

Source: WIPO Statistics Database, October 2016.

Table 3 Total applications and growth in applications

Applications worldwide	Year		
	2014	2015	Growth (%) 2014-15
Patent	2,680,900	2,888,800	7.8
Utility model	948,900	1,205,300	27
Trademark	7,426,867	8,445,300	13.7
Industrial design**	1,137,500	1,144,800	0.6

Table 4 Total patent applications

Office	Patent applications	
	2014	Share of world total (%)
China	1,101,864	38.1
United States of America	589,410	20.4
Japan	318,721	11.0
Republic of Korea	213,694	7.4
European Patent Office	160,028	5.5
Others	505,083	17.5
World total	2,888,800	

Note: Application numbers are a sum of direct filings and PCT national phase entries received by offices (where applicable).

Source: WIPO Statistics Database, October 2015.

Table 5 Share in IP filing activity by Region (Data for year 2015)

a)		
Patents		
Geographical region	Applications	Share of total (%)
Africa	14,800	0.5
Asia	1,786,800	61.9
Europe	360,000	12.5
Latin America & Caribbean	65,600	2.3
North America	626,400	21.7

b)

Trademarks		
Geographical region	Applications	Share of total (%)
Africa	233,200	2.8
Asia	4,669,800	55.3
Europe	2,041,400	24.2
Latin America & the Caribbean	654,800	7.8
North America	672,400	8.0

c)

Utility models		
Geographical region	Applications	Share of total (%)
Africa	240	0.02
Asia	1,152,600	95.6
Europe	46,400	3.8
Latin America & the Caribbean	4,230	0.4

d)

Industrial designs**		
Geographical region	Applications	Share of total (%)
Africa	16,300	1.4
Asia	778,100	68.0
Europe	281,000	24.5
Latin America & the Caribbean	15,000	1.3
North America	46,000	4.0
Oceania	8,400	0.7

**refers to design count – the total number of designs contained in industrial design applications.

Source: for all the above tables WIPO Statistics Database, October 2015.

Table No. 5 has four components hence it is divided into four separate small tables. That is patents, trademarks, utility models and industrial designs. These four are the main assets of knowledge capital and hence shows that maximum capital will be created in Asia.

India in the World Economy

If we look at the position of India in this regard we find that India has constantly shown a rising trend since last 14 years in areas of Patents, Trademarks, and Industrial designs.

Table 6 India's IP Filings (Resident + Abroad, Including Regional) and Economy)

Year	Patent	Trademark	Industrial Design	GDP (Constant 2011 US\$)
2002	4,164	90,751	2,618	2858.92
2003	5,370	79,488	3,034	3083.65
2004	6,728	67,504	3,465	3327.96
2005	8,028	77,908	3,867	3636.96
2006	9,434	93,736	4,078	3973.88
2007	10,529	125,078	4,759	4363.38
2008	11,546	128,122	4,949	4533.16
2009	11,939	143,626	4,610	4917.56
2010	14,869	181,621	5,030	5422.1
2011	15,896	186,783	6,472	5782.04
2012	18,202	188,154	5,900	6097.53
2013	20,908	196,262	6,101	6486.92
2014	22,445	218,725	7,401	6973.78
2015	23,946	270,333	8,245	7532.38
2016	25,795	284,286	7,600	8067.71

Source: World Intellectual Property Organisation.

Intellectual property of India as a percentage of Asia 2015 data

Sr No	Type of Intellectual Property	Asia	India	%age
1	Patent Applications	1786800	45658	2.55
2	Trademark Applications	4669800	274810	5.88
3	Utility Model applications	1152600	-	-
4	Industrial design applications	778100	10290	1.32

Calculated on the basis of two separate tables on regional patterns and India's data

DISCUSSION

India because of its size is among the top 10/12 Economies of the world in terms of the GDP. Its rank in terms of patents filed is even better than some developed countries like Japan, Germany, Korea.

- The earlier literature shows that, in measurement of knowledge economy, Innovation is an important criterion. Patents and Intellectual property is the indication of innovation systems of the country. Hence we can say that India is on the path of knowledge capital creation. The knowledge regime has created challenges for many of the stable economies of the world. At the same time it has also created opportunities for many countries of the world. When Europe and America are lagging behind in growth rate of new patents applications, china has gone much ahead of everybody else.
- Table no1 and Table no2 clearly show that China and United states have maintained their positions as knowledge economy because of the total number of patents applied from these two countries. China has definitely created more knowledge capital than any other country of the world. Overall picture of the world shows that Asia Region is ahead of rest of the world and India enjoys a dominant position in Asian subcontinent.
- Table No.6 clearly highlights the rise in India's growth in patents is more but in number India has more trademarks than patents. Industrial designs also reflect the innovations in the field of engineering and technology where India has not done a remarkable performance as compared to other areas.
- If we are comparing India and China as world's future growth centers India is much behind china in terms of its intellectual capital and the rate or such capital formation. In fact the world will see China taking over USA in knowledge capital in near future. India is said to have growth potential in service sector.
- If more and more knowledge workers are found in service sector especially in Information Technology and computer software field then we should see more patents to be filed in those sectors. Though accurate measurement of knowledge economy is still difficult, it is clearly established that intellectual property like patents, trademarks, industrial designs are playing important role in the growth of GDP as well as in international trade, when the countries are getting rewards of their stock of knowledge capital then we have to examine our country's own position in this regard.

CONCLUSION

India has to nurture and encourage the innovation culture and also develop the systems where by this intellectual property not only results in actual production and exports but also earnings out of the patents and royalties sold to other countries' manufacturers. The Universities and the Educational Institutions are traditionally known as the knowledge centers of a county but in India the research that takes place in academics does not lead to innovations; it remains only for the academic purpose. The knowledge economy of India has created knowledge workers its time to create knowledge capital. While Asia has always been number one for all types of IP applications India's share in it is very less. The majority of Asia region is from China followed by Japan, India, Korea. India has a long way to go before it becomes a Knowledge Economy but the process as certainly began.

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