Relationship between Intellectual Property and Global Innovation Index: Literature Review

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Abstract:
In the era of international integration in the economy, the capacity of innovation is the most important factor that creates competitiveness in each nation’s economy. National innovative capacities are measured by different tools. Traditionally, the national innovation index includes measurements of a number of published research articles, international patent applications, expenditures on research and development, etc. Current Competitiveness Index is a toolset for assessment of overall competitiveness.

Keywords: Intellectual Property, Global Innovation Index

1. Introduction

In the era of international integration in economy, the capacity of innovation is the most important factor that creates competitiveness of each nation's economy. National innovative capacities are measured by different tools. Traditionally, national innovation index includes measurements are number of published research articles, international patent applications, expenditures on research and development, etc. Current Competitiveness Index is a tool set for assessment of overall competitiveness. In recent decades, innovative capacities of nations are measured and compared on global scale through the Global Innovation Index (GII), which was brought into use by the World Intellectual Property Organization (WIPO) in 2007. The GII aims to capture the multi-dimensional facets of innovation and provide the tools that can assist in tailoring policies to promote long-term output growth, improved productivity, and job growth. The GII helps to create an environment in which innovation factors are continually evaluated. It provides a key tool and a rich database of detailed metrics for both micro-economy and macro-economy.

Innovation systems are considered according to different focuses and coverages. The national innovation system focuses on examining organizations and institutions that have a macro influence on entities within national borders. The regional innovation system focuses on the interaction of entities in a geographical region with a focus on businesses in the same industry, business clusters and related supporting organizations, local and regional institutions and customs. The innovation system focuses on the core technology issues of the industry, links along the value chain, but supplier-producer-customer interaction.

Creative innovation comes not only from research and development, but also primarily from the process of working, using and interacting. Enterprise interactive learning plays a central role in the creative innovation system. According to this approach, in addition to S&T, the creative innovation system also has social institutions, macroeconomic governance, financial systems, education and communication infrastructure, and market conditions.

(Lundvall, Chaminade and Vang 2009) propose the definition of the national creative innovation system: "The national creative innovation system is an open, evolving and complex system, including the relationships within each organization and between socio-economic organizations, institutions and structures, regulating the speed and direction of innovation as well as building professional competencies resulting from a science-based and a learning based process experience".

(Furman, Porter and Stern, 2002) propose the definition of the NIC: “The national innovative capacity is defined as country's potential - as both an economic and political entity - to produce a stream of commercially relevant innovations”.

http://www.ijmsbr.com
2. Literature review

2.1. Intellectual Property (IP)

Definition of IP

IP is a category of property that includes intangible creations of the human intellect, in the form of legitimate rights over such creations. The main content of such right is economic right, namely the right to exploit commercial value of the intellectual creations. The nature of such property right is reflected by the term IPR although IPRs also include moral rights of authors, inventors, designers. Therefore, the terms IP and IPR (IP right) are often used interchangeably. Besides, from the term IPR flows a narrow meaning of the term IP, namely the object of the right, i.e., intellectual creations such as literary and artistic works, inventions, industrial designs, etc.

However, in the broadest sense, IP means the whole IPR protection system, that covers IPR itself and anything related to IPR, from IPR protection institution (legal protection regime, administration, and enforcement organization), IPR objects, IPR applications and grants, IPR transactions (assignment and licensing), IPR exploitations (products and services embodying IPR subject matter), etc.

IPR categories

IPRs are categorized by subject matters of legal protection, which include the rights as relating to “Literary, artistic and scientific works; performances of performing artists, phonograms, and broadcasts; inventions in all fields of human endeavor; scientific discoveries; industrial designs; trademarks, service marks, and commercial names and designations; protection against unfair competition; and “all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields.” (Convention Establishing the World Intellectual Property Organization, Signed at Stockholm on July 14, 1967; Article 2, § viii)

IPR branches

IPRs can be divided into two main branches according to the industry sectors, namely (i) copyright to literary, artistic and scientific works and copyright-related rights to performances, phonograms, video recordings, broadcasts and encrypted program-carrying satellite signals; (ii) industrial property rights to inventions (patents, including utility models/solutions), industrial designs, layout-designs of semiconductor integrated circuits, trade secrets, trademark (including service mark), trade names and geographical indications. The right to plant varieties may be isolated as the third category in some countries, e.g., in Vietnam (Articles 3 and 4, IP Law) or may fall in the category of industrial property rights.

IPR groups

IPRs can be grouped by the fields of use, namely:

(i) Entertainment creation: Copyrights and Related rights. The main social purpose of protection of copyright and related rights is to encourage and reward creative work to enrich people cultural life. The copyright protection is copying prevention right given until the author’s death plus 50 years thereafter.

(ii) Technology creation and industrial design: Patents, Utility models/solutions, Trade secrets (technical knowhow), Layout design of semiconductor integrated circuits, Plant variety rights and Industrial designs. The protection is primarily to stimulate innovation, design and the creation of technology. The social purpose is to provide protection for the results of investment in the development of new technology, thus giving the incentive and means to finance research and development activities and to facilitate the transfer of technology in the form of foreign direct investment, joint ventures and licensing. The protection is typically an exclusive right given for a finite term, for example 20 years in the case of patents.
Commercial indications: trademark (including service mark), trade names and geographical indications. The protection of these distinctive signs aims to stimulate and ensure fair competition and to protect consumers, by enabling them to make informed choices between various goods and services. The protection may last indefinitely, provided the sign in question continues to be distinctive.

The role of Intellectual Property

(Goldstein P. and Reese R.A., 2008) The main purpose of intellectual property law is to encourage the creation of a wide variety of intellectual goods. To achieve this, the law gives people and businesses property rights to the information and intellectual goods they create, usually for a limited period of time. This gives economic incentive for their creation, because it allows people to profit from the information and intellectual goods they create. (Rod Falvey and Neil Foster, 2006) These economic incentives are expected to stimulate innovation and contribute to the technological progress of countries, which depends on the extent of protection granted to innovators.

The essential value of legal protection of IP is giving exclusive property rights over intangible assets, for a certain period of time. It enables enterprises to exploit his asset that can often be traded in the market place. If the innovative creation of an enterprise are not legally protected by IP rights, then these may be freely used by any other enterprises. Consequently, the innovative enterprise can lose in the market because of unfair competitors. However, when the innovative creation are protected by IP rights, they acquire concrete value for innovative enterprise as they become property rights which cannot be commercialized or used by competitors without authorization. Enterprises over the world are getting more and more aware of the value of their IP assets and starting to undertake regular technology and IP audits. IP assets are in fact worth more than physical assets. That make more and more enterprises target on IP-intensive business.

(Idris, 2003) IP is a "power tool" for economic development and wealth creation that is not yet being used to optimal effect in all countries, particularly in the developing world. Using those intangible assets, such as knowledge, information, creativity and inventiveness - that are rapidly replacing traditional and tangible assets - such as land, labour and capital - as the driving forces of economic health and social well-being.

Nowadays it is common understanding and widely underlined in international trade agreements that the protection of IPR is essential to maintaining economic growth. (WIPO, 2004) There are two reasons for legal protection of IPR: One is to give statutory expression to the moral and economic rights of creators in their creations and the rights of the public in access to those creations. The second is to promote, as a deliberate act of Government policy, creativity and the dissemination and application of its results and to encourage fair trading which would contribute to economic and social development.

The science and technology innovations play a vital role in development of the economy, where IP is back born of technology innovation and a measurement of technology level. Patent is one of the most effective types of IPR for achieving economic development, because it encourages technology breakthroughs.

2.2. Global Innovation Index

Definition of Global Innovation Index

The Global Innovation Index (GII) is a toolkit for measurement by scoring and ranking NICs, constructed by the school of economy INSEAD (France) in 2007 jointly with WIPO and Cornell University (US). The GII project was launched with the simple goal of determining how to find metrics and approaches that better capture the richness of innovation in society and go beyond such traditional measures of innovation as the number of research articles and the level of research and development (R&D) expenditures. Therefore, GII is considered to be better, more diverse and more justifiable compared to traditional measurements.
There were several motivations for setting this goal. First, innovation is important for driving economic progress and competitiveness—both for developed and developing economies. Many governments are putting innovation at the centre of their growth strategies. Second, the definition of innovation has broadened—it is no longer restricted to R&D laboratories and to published scientific papers. Innovation could be and is more general and horizontal in nature, and includes social innovations and business model innovations as well as technical ones. Last but not least, recognizing and celebrating innovation in emerging markets is seen as critical for inspiring people—especially the next generation of entrepreneurs and innovators.

The GII helps to create an environment in which innovation factors are under continual evaluation, and it provides a key tool for refining innovation policies.

The GII is not meant to be the ultimate and definitive ranking of economies with respect to innovation. Measuring innovation outputs and impacts remains difficult, hence great emphasis is placed on measuring the climate and infrastructure for innovation and on assessing related outcomes.

Although the end results take the shape of several rankings, the GII is more concerned with improving the ‘journey’ to better measure and understand innovation and with identifying targeted policies, good practices, and other levers that foster innovation. The rich metrics can be used - on the level of the index, the sub-indexes, or the actual raw data of individual indicators - to monitor performance over time and to benchmark developments against countries in the same region or of the same income category.

Drawing on the expertise of the GII’s Knowledge Partners and its prominent Advisory Board, the GII model is continually updated to reflect the improved availability of statistics and our understanding of innovation. In 2019, the model continues to evolve, although its mature state now requires only minor updates.

Dimensions of Global Innovation Index

The GII conceptual framework

The GII is an evolving project that builds on its previous editions while incorporating newly available data and that is inspired by the latest research on the measurement of innovation. This year the GII model includes 128 countries/economies, which represent 92.8% of the world’s population and 97.9% of the world’s GDP (in current US dollars). The GII relies on two sub-indexes—the Innovation Input Sub-index and the Innovation Output Sub-index—each built around pillars.

The Innovation Input Sub-Index

The first sub-index of the GII, the Innovation Input Sub-Index, has five enabler pillars: Institutions, Human capital and research, Infrastructure, Market sophistication, and Business sophistication. Enabler pillars define aspects of the environment conducive to innovation within an economy.

Pillar 1: Institutions

The Institutions pillar captures the institutional framework of a country. Nurturing an institutional framework that attracts business and fosters growth by providing good governance and the correct levels of protection and incentives is essential to innovation.

The Political environment sub-pillar includes two indexes: one that reflects perceptions of the likelihood that a government might be destabilized; and one that reflects the quality of public and civil services, policy formulation, and implementation.

The Regulatory environment sub-pillar draws on two indexes aimed at capturing perceptions on the ability of the government to formulate and implement cohesive policies that promote the development of the private sector and at evaluating the extent to which the rule of law prevails (in aspects such as contract enforcement, property rights, the police, and the courts). The third indicator evaluates the cost of redundancy dismissal as the
sum, in salary weeks, of the cost of advance notice requirements added to severance payments due when terminating a redundant worker.

The Business environment subpillar expands on three aspects that directly affect private entrepreneurial endeavours by using the World Bank indexes on the ease of starting a business; the ease of resolving insolvency (based on the recovery rate recorded as the cents on the dollar recouped by creditors through reorganization, liquidation, or debt enforcement/foreclosure proceedings); and the ease of paying taxes.

Pillar 2: Human capital and research

The level and standard of education and research activity in a country are prime determinants of the NIC. This pillar tries to gauge the human capital of countries.

The first sub-pillar includes a mix of indicators aimed at capturing achievements at the elementary and secondary education levels. Education expenditure and school life expectancy are good proxies for coverage. Government expenditure per pupil, secondary gives a sense of the level of priority given to secondary education by the state. The quality of education is measured through the results to the OECD Programme for International Student Assessment (PISA), which examines 15-year-old students’ performances in reading, mathematics, and science, as well as the pupil-teacher ratio.

Higher education is crucial for economies to move up the value chain beyond simple production processes and products. The sub-pillar on tertiary education aims at capturing coverage (tertiary enrolment); priority is given to the sectors traditionally associated with innovation (with a series on the percentage of tertiary graduates in science and engineering, manufacturing, and construction); and the inbound and mobility of tertiary students, which plays a crucial role in the exchange of ideas and skills necessary for innovation.

The last sub-pillar, on R&D, measures the level and quality of R&D activities, with indicators on researchers (full-time equivalence), gross expenditure, the R&D expenditures of top global R&D spenders, and the quality of scientific and research institutions as measured by the average score of the top three universities in the QS World University Ranking of 2015. The average R&D expenditures of the top three firms in a given country looks at the average expenditure of these three firms that are part of the top 2,500 R&D spenders worldwide. The QS university rankings indicator gives the average scores of the country’s top three universities that belong to the top 700 universities worldwide. These indicators are not aimed at assessing the average level of all institutions within a particular economy.

Pillar 3: Infrastructure

The third pillar includes three subpillars: Information and communication technologies (ICTs), General infrastructure, and Ecological sustainability.

Good and ecologically friendly communication, transport, and energy infrastructures facilitate the production and exchange of ideas, services, and goods and feed into the innovation system through increased productivity and efficiency, lower transaction costs, better access to markets, and sustainable growth.

The ICTs sub-pillar includes four indexes developed by international organizations on ICT access, ICT use, online service by governments, and online participation of citizens.

The sub-pillar on general infrastructure includes the average of electricity output in kWh per capita; a composite indicator on logistics performance; and gross capital formation, which consists of outlays on additions to the fixed assets and net inventories of the economy, including land improvements (fences, ditches, drains); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings.
The sub-pillar on ecological sustainability includes three indicators: GDP per unit of energy use (a measure of efficiency in the use of energy), the Environmental Performance Index of Yale and Columbia Universities, and the number of certificates of conformity with standard ISO 14001 on environmental management systems issued.

Pillar 4: Market sophistication

The availability of credit and an environment that supports investment, access to the international market, competition, and market scale are all critical for businesses to prosper and for innovation to occur. The Market sophistication pillar has three sub-pillars structured around market conditions and the total level of transactions.

The Credit sub-pillar includes a measure on the ease of getting credit aimed at measuring the degree to which collateral and bankruptcy laws facilitate lending by protecting the rights of borrowers and lenders, as well as the rules and practices affecting the coverage, scope, and accessibility of credit information. Transactions are given by the total value of domestic credit and, in an attempt to make the model more applicable to emerging markets, by the gross loan portfolio of microfinance institutions.

The Investment sub-pillar includes the ease of protecting minority investors index as well as two indicators on the level of transactions. These two indicators look at whether market size is matched by market dynamism and provide a hard data metric on venture capital deals.

The last sub-pillar tackles trade, competition, and market scale. The market conditions for trade are given in the first indicator measuring the average tariff rate weighted by import shares. The second indicator is a survey question that reflects the intensity of competition in local markets. Efforts made at finding hard data on competition so far remain unsuccessful. Domestic market scale, as measured by an economy’s GDP, was incorporated in 2016, so the last sub-pillar takes into consideration the impact that the size of an economy has on its capacity to introduce and test innovations in the market place.

In broad terms, pillar on market sophistication makes the case that well-functioning markets contribute to the innovation environment through competitive pressure, efficiency gains, and economies of transaction and by allowing supply to meet demand. Markets that are open to foreign trade and investment have the additional effect of exposing domestic firms to best practices around the globe, which is critical to innovation through knowledge absorption and diffusion, which are considered in pillars 5 and 6. The rationale behind sub-pillars 5.3 on knowledge absorption (an enabler) and 6.3 on knowledge diffusion (a result)—two sub-pillars designed to be mirror images of each other—is precisely that together they will reveal how good economies are at absorbing and diffusing knowledge.

Pillar 5: Business sophistication

The last pillar tries to capture the level of business sophistication. The Human capital and research pillar (pillar 2) made the case that the accumulation of human capital through education, particularly higher education and the prioritization of R&D activities, is an indispensable condition for innovation to take place. That logic is taken one step further here with the assertion that businesses foster their productivity, competitiveness, and innovation potential with the employment of highly qualified professionals and technicians.

The first sub-pillar includes four quantitative indicators on knowledge workers: employment in knowledge-intensive services; the availability of formal training at the firm level; R&D performed by business enterprise (GERD) as a percentage of GDP (i.e., GERD over GDP); and the percentage of total gross expenditure of R&D that is financed by business enterprise. In addition, the sub-pillar includes an indicator related to the percentage of females employed with advanced degrees. This indicator, in addition to providing a glimpse into the gender
labour distributions of nations, offers more information about the degree of sophistication of the local human capital currently employed.

Innovation linkages and public/private/academic partnerships are essential to innovation. In emerging markets, pockets of wealth have developed around industrial or technological clusters and networks, in sharp contrast to the poverty that may prevail in the rest of the territory. The Innovation linkages sub-pillar draws on both qualitative and quantitative data regarding business/university collaboration on R&D, the prevalence of well-developed and deep clusters, the level of gross R&D expenditure financed by abroad, and the number of deals on joint ventures and strategic alliances. In addition, the total number of Patent Cooperation Treaty (PCT) and national office published patent family applications filed by residents in at least two offices proxies for international linkages. The GII team has been evaluating various hard data–based indicators to measure innovation linkages in an economy. Measuring innovation linkages adequately remains challenging, if not impossible, based on existing innovation metrics.

Sub-pillar 5.3 includes five metrics that are linked to sectors with high-tech content or are key to innovation: IP payments as a percentage of total trade; high-tech net imports as a percentage of total imports; imports of communication, computer and information services as a percentage of total trade; and net inflows of foreign direct investment (FDI) as a percentage of GDP (three-year average). To strengthen the sub-pillar, the percentage of research talent in business was added in 2016 to provide a measurement of professionals engaged in the conception or creation of new knowledge, products, processes, and methods and systems, including business management.

The Innovation Output Sub-Index

Innovation outputs are the results of innovative activities within the economy. Although the Output Sub-Index includes only two pillars, it has the same weight in calculating the overall GII scores as the Input Sub-Index. There are two output pillars: Knowledge and technology outputs and Creative outputs.

Pillar 6: Knowledge and technology outputs

This pillar covers all those variables that are traditionally thought to be the fruits of inventions and/or innovations. The first subpillar refers to the creation of knowledge. It includes five indicators that are the result of inventive and innovative activities: patent applications filed by residents both at the national patent office and at the international level through the PCT; utility model applications filed by residents at the national office; scientific and technical published articles in peer-reviewed journals; and an economy’s number of articles (H) that have received at least H citations.

The second sub-pillar, on knowledge impact, includes statistics representing the impact of innovation activities at the micro- and macroeconomic level or related proxies: increases in labour productivity, the entry density of new firms, spending on computer software, the number of certificates of conformity with standard ISO 9001 on quality management systems issued, and the measure of high- and medium- high-tech industrial output over total manufactures output.

The third sub-pillar, on knowledge diffusion, is the mirror image of the knowledge absorption sub-pillar of pillar 5, with the exception of indicator 5.3.5. It includes four statistics all linked to sectors with high-tech content or that are key to innovation: IP receipts as a percentage of total trade; high-tech net exports as a percentage of total exports; exports of ICT services as a percentage of total trade; and net outflows of FDI as a percentage of GDP (three-year average).

Pillar 7: Creative outputs
The role of creativity for innovation is still largely underappreciated in innovation measurement and policy debates. Since its inception, the GII has always emphasized measuring creativity as part of its Innovation Output Sub-Index. The last pillar, on creative outputs, has three sub-pillars.

The first sub-pillar on intangible assets includes statistics on trademark applications by residents at the national office; industrial designs included in applications at a regional or national office, and two survey questions regarding the use of ICTs in business and organizational models, new areas that are increasingly linked to process innovations in the literature.

The second sub-pillar on creative goods and services includes proxies to get at creativity and the creative outputs of an economy. In 2014, in an attempt to include broader sectoral coverage, a global entertainment and media output composite was added. In addition, in 2017 the indicator on audio-visual and related services exports was renamed ‘Cultural and creative services exports’ and expanded to include information services, advertising, market research and public opinion polling, and other, personal, cultural and recreational services (as a percentage of total trade). These two indicators complement the remainder of the sub-pillar, which measures national feature films produced in a given country (per capita count) and printing and recorded media output (as a percentage of total manufactures output), which underwent methodological change to precisely capture printing and media outputs and exclude paper industry outputs (see Annex 2 for details). Finally, the sub-pillar also measures creative goods exports (as a percentage of total trade), all which are aimed at providing an overall sense of the international reach of creative activities in the country.

The third sub-pillar on online creativity includes four indicators: generic and country-code top level domains and average yearly edits to Wikipedia, all scaled by population aged 15 through 69 years old, and mobile app creation, which is scaled by GDP (bn PPP $). This year the indicator on mobile app creation replaces the indicator video uploads on YouTube. Mobile apps represent the global commerce in digital goods, and therefore provide insight into how innovation, production and trade of digitalized creative products and services are evolving in an innovation-based economy.

GII Annual Report

Four major measures calculated

There are four major comprehensive indexes in GII Report that reflect the overall picture of NIC, namely:

(i) Innovation Input Sub-Index: Five input pillars capture elements of the national economy that enable innovative activities;

(ii) Innovation Output Sub-Index: Innovation outputs are the results of innovative activities within the economy. Although the Output Sub-Index includes only two pillars, it has the same weight in calculating the overall GII scores as the Input Sub-Index;

(iii) The overall GII score is the simple average of the Input and Output Sub-Indexes;

(iv) The Innovation Efficiency Ratio is the ratio of the Output Sub-Index to the Input SubIndex. It shows how much innovation output a given country is getting for its inputs.

GII Annual Reports pay special attention to presenting a scoreboard for each economy that includes strengths and weaknesses, making accessible the data series, and providing data sources and definitions and detailed technical notes. Adjustments to the GII framework, including a detailed analysis of the factors influencing year-on-year changes, are detailed. In addition, since 2011 the GII has been submitted to an independent statistical audit performed by the Joint Research Centre of the European Union.

2.3. Relation between Intellectual Property and Global Innovation Index

IP-related indicators in GII framework
Out of more than 80 GII indicators, there are 14 indicators related to IP, which fall in only 4 among 7 GII areas as follows:

Institution (Pillar 1) includes 2 indicators of regulatory environment (1.2.1 – Regulatory quality and 1.2.2 – Rule of law)

Business Sophistication (Pillar 5) includes 1 indicator of innovation linkage (5.2.5 - Patent families filed in two offices); and 1 indicator of knowledge absorption (5.3.1 - IP payments).

Knowledge and Technology Outputs (Pillar 6) includes 3 indicators of knowledge creation (6.1.1 - Patent application by origin; 6.1.2 - PCT international applications by origin; 6.1.3 - Utility model application by origin); 1 indicator of knowledge impact (6.2.3 - Total computer software spending); and 1 indicator of knowledge diffusion (6.3.1 - IP receipts).

Creative outputs (Pillar 7) includes 2 indicators of intangible assets (7.1.1 - Trademark application class count by origin and 7.1.2 - Industrial designs by origin) and 3 indicators of creative goods and services (7.2.2 - National feature films produced, 7.2.3 - Entertainment and media market and 7.2.4 - Printing, publications & other media output).

Types of IP-related GII indicators

There are 3 types of IP-related GII indicators: (i) 2 IP institution-related indicators, which are qualitatively judged based on IP law and policy as an element;

(ii) 8 IPR-related indicators, which based on statictics of IPR, particularly patents, utility models, trademarks, industrial designs and IPR transaction value; and (iii) 4 IP product-related indicators, which based on statistics of copyright and related right products.

The meaning and calculation of Intellectual Property-related indicators in Global Innovation Index

IP-related input indicators are meaningful as investments in innovation leading to creative results. There are 4 of them:

(i) Indicator 1.2.1 - Regulatory quality is one of six Worldwide Governance Indexes developed by WB, calculated based on 10 assessments, 2 out of which include IP parameters as criteria: (i) ASEAN Development Bank Country Policy and Institutional Assessment (ASD) carried out annually by Asia Development Bank (ADB), based on 16 aspects of institution and policy, 2 of which, including trade policy, are used for assessment of regulatory quality. IP policy is for sure one of pillar of trade policy; (ii) Economist Intelligence Unit (EIU) in Britain assesses regulatory quality with monthly updating, based on 5 criteria, including unfair competition cases, with worldwide network of 500 specialists, by grading down from 1 to 4 points.

Beside, World Economic Forum (WEF) makes annual survey on Global competitive capacity, where calculation of regulatory quality is based on 6 criteria, including burden of administrative requirements compliance, with worldwide enterprises, by grading up from 1 to 7 points. Industrial Property right registration produces are a huge set of administrative requirements.

(ii) Indicator 1.2.2 - Rule of law is one of six Worldwide Governance Indexes developed by WB, calculated based on 12 assessments, 3 out of which include IP parameters as criteria: (i) Economist Intelligence Unit (EIU) in Britain assesses rule of law annually, based on 8 criteria, including IPR enforcement, with worldwide network of 500 specialists, by grading down from 1 to 4 points; (ii) World Economic Forum (WEF) makes annual survey on Global competitive capacity, where calculation of rule of law is based on 7 criteria, including IPR enforcement including anti-counterfeiting measures, with worldwide enterprises, by grading up from 1 to 7 points; (iii) Institutional Profile Database (IPD) of French Government makes each 3 year survey on national...
institution where survey on rule of law is based on 18 criteria, including respect of IPR regarding patent and trade secrets and respect of IPR regarding counterfeits.

(iii) Indicator 5.2.5 - Patent families filed in two offices

Indicator 5.2.5 is number of patent families filed by residents in at least two offices (per billion PPP $ GDP) in a year.

A ‘patent family’ is a set of interrelated patent applications filed in one or more countries or jurisdictions to protect the same invention. Patent families containing applications filed in at least two different offices is a subset of patent families where protection of the same invention is sought in at least two different countries. Patent families data refer to patent applications filed by residents in at least two IP offices; the data are scaled by PPPS GDP (billions). A ‘patent’ is a set of exclusive rights granted by law to applicants for inventions that are new, non-obvious, and commercially applicable. A patent is valid for a limited period of time (generally 20 years), during which patent holders cancommercially exploit their inventions on an exclusive basis. In return, applicants are obliged to disclose their inventions to the public in a manner that enables others, skilled in the art, to replicate the invention. The patent system is designed to encourage innovation by providing innovators with time-limited exclusive legal rights, thus enabling them to appropriate the returns from their innovative activity.

Patent families filed in two offices is an indicator of creative inputs because although patent application by origin is creative output (indicator 6.1.1 mentioned below), the patent families data reflect enterprises’s capacity of innovation linkage. The higher the charges for use of IP, the higher the score and ranking in GII.

(iv) Indicator 5.3.1 - IP payments

Indicator 5.3.1 is charges for use of IP, i.e. payments made in a year (% of total trade).

Charges for the use of IP not included elsewhere payments (% of total trade) according to the Extended Balance of Payments Services Classification EBOPS 2010. ‘Total trade’ is defined as the sum of total imports plus total exports, divided by 2. Receipts are between residents and nonresidents for the use of proprietary rights (such as patents, trademarks, copyrights, industrial processes and designs including trade secrets, franchises), and for licenses to reproduce or distribute (or both) IP embodied in produced originals or prototypes (such as copyrights on books and manuscripts, Computer software, cinematographic works, and sound recordings) and related rights (such as for live performances and television, cable, or satellite broadcast). It is to be noted that GII does not take into account transaction within the domestic market.

IP payments is an indicator of creative inputs because transaction itself does not create value yet when IP is not yet applied in practice. The higher the charges for use of IP, the higher the score and ranking in GII.

IP-related output indicators are products resulted from innovation investments. There are 10 of them:

(i) Indicator 6.1.1 - Patent application by origin

Indicator 6.1.1 is number of resident patent applications filed at a given national or regional patent office (per billion PPPS GDP) in a year. ‘Patent’ is defined in the description of indicator 5.2.5. A ‘resident patent application’ refers to an application filed with an IP office or an office acting on behalf of the State or jurisdiction in which the first-named applicant has residence. For example, an application filed with the IP Vietnam by a resident of Vietnam is considered a resident application for Vietnam. Similarly, an application filed with the European Patent Office (EPO) by an applicant who resides in any of the EPO member States, for example, Germany, is considered a resident application for that member State (Germany).

Patent application by origin is an indicator of creative outputs because inventions are new creative knowledge. The higher the number of patent registration applications per GDP, the higher the score and ranking in GII.

(ii) Indicator 6.1.2 - PCT international applications by origin
Indicator 6.1.2 is the number of International patent applications filed by residents via the Patent Cooperation Treaty (per billion ppp$ GDP) in a year. An ‘PCT international application’ refers to a patent application filed through the WIPO-administered Patent Cooperation Treaty (PCT) during the international phase outlined by the PCT System. The origin of PCT applications are defined by the residence of the first-named applicant. The PCT System facilitates the filing of patent applications worldwide, making it possible to seek patent protection for an invention simultaneously in each of a large number of countries by at first filing a single international patent application.

PCT international applications by origin is an indicator of creative outputs because and the data reflect new creative knowledge having possible global value.

The higher the number of patent applications per GDP, the higher the score and ranking in GII.

(iii) Indicator 6.1.3 - Utility model application by origin

Indicator 6.1.3 is number of utility model applications filed by residents at the national patent office (per billion ppp$ GDP) in a year.

A ‘resident UM application’ refers to an application filed with an IP office of or an office acting on behalf of the State or jurisdiction in which the first-named applicant has residence. For example, an application filled with the IP office of Germany by a resident of Germany is considered a resident application for Germany. A utility model grant is a special form of patent right issued by a State or jurisdiction to an inventor or the inventor’s assignee for a fixed period of time. The terms and conditions for granting a utility model are slightly different from those for normal patents and include a shorter term of protection and less stringent patentability requirements. A utility model is sometimes referred to in certain countries as ‘petty patents’, ‘short-term patents’ or ‘innovation patents’.

Utility model application by origin is an indicator of creative outputs because utility models are new knowledge. The higher the number of utility model registration applications per GDP, the higher the score and ranking in GII.

(iv) Indicator 6.2.3 - Total computer software spending

Software is copyrighted product. Total expenses on buying and hiring software per GDP is an innovation output. The the higher such expenses, the score and ranking in GII.

(v) Indicator 6.3.1 - IP receipts

Indicator 6.3.1 is charges for use of IP, i.e. receipts from IP (% of total trade) in a year.

Indicator 6.3.1 is charges for the use of IP not included elsewhere receipts (% of total trade) according to the Extended Balance of Payments Services Classification EBOPS 2010. Total trade’ is defined as the sum of total imports plus total exports, divided by 2. Receipts are between residents and nonresidents for the use of proprietary rights (such as patents, trademarks, copyrights, industrial processes, and designs including trade secrets, franchises and for licenses to reproduce or distribute (or both) IP embodied in produced originals or prototypes (such as copyrights on books and manuscripts, computer software, cinematographic works, and sound recordings) and related rights (such as for live performances and television, cable, or satellite broadcast). It is to be noted that GII does not take into account transaction within the domestic market.

Indicator 6.3.1 is creative outputs because receipts from transactions of IP are value of IP commercialization. Putting IP into the market is itself innovation. Therefore, the higher the rate of receipts in IP trade between countries to the total trade, the higher the score and ranking in GII.

(vi) Indicator 7.1.1 - Trademark application class count by origin
Indicator 7.1.1 is the number of trademark applications issued to residents at a given national or regional office (per billion PPP$ GDP) in a year.

The data refer to trademark application class counts—the number of classes specified in resident trademark applications—and include those filed at both the national office and the regional office, where applicable. The data are scaled by PPP$ GDP (billions).

A ‘trademark’ is a sign used by the owner of certain products or provider of certain services to distinguish them from the products or services of other companies. A trademark can consist of words and/or combinations of words, such as slogans, names, logos, figures and images, letters, numbers, sounds and moving images, or a combination thereof. The procedures for registering trademarks are governed by the legislation and procedures of national and regional IP offices. Trademark rights are limited to the jurisdiction of the IP office that registers the trademark. Trademarks can be registered by filing an application at the relevant national or regional office(s) or by filing an international application through the Madrid System. A resident trademark application is one that is filed with an IP office or an office acting on behalf of the State or jurisdiction in which the applicant has residence. For example, an application filed with the IP Vietnam by a resident of Vietnam is considered a resident application for Vietnam. Similarly, an application filed with European Union Intellectual Property Office (EUIPO), previously was the Office for Harmonization in the Internal Market (OHIM), by an applicant who resides in any of the EU member States, such as France, is considered a resident application for that member State (France).

Trademark application class count by origin is an indicator of creative outputs. The trademark registration to a certain extent reflects enterprises’ results of innovation on products. The higher the number of trademark registration applications per GDP, the higher the score and ranking in GII.

(vii) Indicator 7.1.2 - Industrial designs by origin

Indicator 7.1.2 is the number of designs contained in industrial design applications filed at a given national or regional office (per billion PPP$ GDP) in a year.

This data refer to industrial design application design counts the number of designs contained in applications and include designs contained in resident industrial design applications filed at both the national office and at the regional office, where applicable. ‘Resident design counts’ refers to the number of designs contained in applications filed with the Intellectual Property office of or at an office acting on behalf of the State or jurisdiction in which the applicant has residence. For example, an application filed with the IP Vietnam by a resident of Vietnam is considered a resident application for Vietnam. Similarly, an application filed with European Union Intellectual Property Office (EUIPO), previously was the Office for Harmonization in the Internal Market (OHIM) by an applicant who resides in any of the OHIM member State, such as Italy, is considered as a resident application for that member State (Italy). Industrial designs by origin is an indicator of creative outputs. The industrial design registration reflects results of innovation on products. The higher the number of industrial design registration applications per GDP, the higher the score and ranking in GII.

(viii) Indicator 7.2.2 - National feature films produced

Film is a copyrighted cultural product. Number of produced national films per million population 15-69 years old is an output indicator. The greater such market, the higher the score and ranking in GII.

(ix) Indicator 7.2.3 - Entertainment and media market

Entertainment and media cover products subject to copyright and related right. Entertainment and media market per thousand population 15-69 years old is an output indicator. The greater such market, the higher the score and ranking in GII.
Printing, publications & other media output are or cover products subject to copyright and related right. Total Products of printing, publications & other media output per GDP is an output indicator. The greater such market, the higher the score and ranking in GII.

4. Conclusion

Vietnam State has constructed a quite modern legal system of IPR protection and keeps pace with the upgrading of the international standards in the worldwide free trade era. It is a common understanding that having an appropriate IP system is an effective way to enhance creativity, promote technological innovations, improve trade, and enhance competitive power. In practice, it is not easy to see whether the current IP system does or does not give effective and appropriate fuel to the economy. Appropriate tools to measure the effectiveness of the IP system need to be found or improved. GII is a tool being used by many countries over the world. Vietnam Government put many efforts into accelerating the use of GII as a tool to see and enhance the innovation competence of the country. These efforts include the promulgation of policy and administrative instruments. Their implementation has gained certain fruits with some instruments and has been started with some others. The study systemizes the theoretical background of the innovation system, innovation index, especially GII, particularly IP-Related GII indicators.

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