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Innovativeness as the determinant of the economic development in India. Indian economy in comparison with the world innovation leaders

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Innovativeness as the determinant of the economic development in India. Indian economy in comparison with the world innovation leaders

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Innovativeness as the determinant of the economic development in India. Indian economy in comparison with the world innovation leaders

Joanna Prystrom¹

Abstract

Research background: The advancing globalization processes, the take-up on the strength of competition, or the ever-changing needs of the people are forcing economies and the functioning of these entities, constantly being innovative. Innovation is a kind of “an idea for a better tomorrow”, which can help you to persevere in this turbulent environment, and not “innovate, that is, to die” (Freeman, 1973). It is obvious, that aspect of innovations already tested since time immemorial, but innovation economy of India, which until a few years ago, grew at the fastest pace in the world, seems to be a worthy area to study.

Purpose of the article: The purpose of the present discourse is an attempt to present the role of innovations in one of the fastest developing economies – Indian economy, as well as elaboration on the aspects of its innovativeness compared with the group of most innovative, competitive and well developed economies in the world.

Methodology/methods: literature analysis, data analysis, statistical analysis of the data source, Pearson's correlation coefficient.

Findings & Value added: The Indian economy is one of the most innovative in BRICS group. India is aware of the role of innovation in economic development, which confirms, among other things the fact that many institutions and government action is aimed at supporting innovative activity in the country (for example DRDO, ISRO, IIP, FICCI, or NIF and C-DAC).

In the state of changing customers' expectations, modern technologies successfully develop not only in the Europe, United States or Japan. To the circle of innovative tycoons candidate also India where in the recent years, economic development is significantly dynamic. Modern technologies in India are considered better. Innovations constitute important area of Indian economy and decisive solutions and interesting methods can be interesting for the European entrepreneurs.

After the crisis, the situation of Europe will be more complicated. It is widely known that dynamically developing world will decide on the developing economies. It means that they will need more raw materials for the fulfilment of the growing appetite and huge innovation pressure for the search of adequate solutions for rich and still averagely poor markets. Therefore, not only tablets for 35 USD appear but also new energetic technologies. The Indian innovativeness is giving this to world.

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India as a country struggling economic crisis and the actions taken in connection with the chance which brings with it innovation, can serve as a worthy model to follow. Courageous, but - it seems - be a matching statement might be: "... you do not have sufficient funds to purchase the newest Ipod, try to create their own, much cheaper ... you will certainly find interest among potential customers ..."

JEL Classification: O3

Keywords: innovativeness, economic development, India, world innovation leaders, BRICS

Introduction

In the face of considerable challenges of the XXI century, constantly progressing globalization processes, rapidly changing economic situations and customers' expectations, innovations seem to be the valuable tool conditioning the existence in the turbulent environment. The subject performing innovative activity is able to persist on the market and overcome the threat of constantly escalating competition. (Tushman *et al.*, 1997, p. 4)

Innovative activity relate to the ability to introduce new innovative products or services on the market, use of more effective and economic methods of production etc. Therefore, it delivers chances of development, entrance on the new potential markets or increased participation in the present markets. It frequently increases the production or the possibility to create new work places. In terms of economic situation it can also influence the growth of GDP or the reduction of the level of unemployment which has measurable effects on economic condition.

The purpose of the present discourse is an attempt to present the role of innovations in one of the fastest developing economies – Indian economy, as well as elaboration on the aspects of its innovativeness compared with the group of most innovative, competitive and well developed economies in the world.

Method of the Research

The essence of innovation is today raised in numerous publications and scientific reports. Many institutions such as the WEF, the World Bank, WIPO, OECD, EC or IRI try every year to share the most current data on the state of innovation national economies and functioning in the framework of their businesses.

Extremely interesting and worthy of dissemination of information is provided by Indian sources, showing how there tends to reinforce the innovative capacity, as seen in the rankings accurately, because India rise rela-

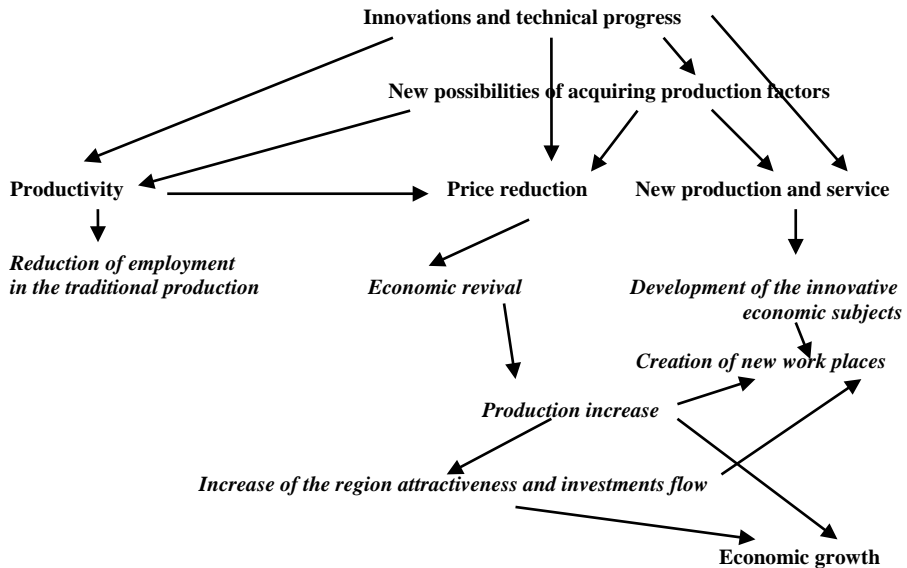
tive to other economies, and as mentioned the Indian economy is one of the most innovative in BRICS group.

This article is based on literature, data source and statistical analysis, and Pearson's correlation coefficient.

Innovations – the issue and importance for the economic growth

The concept of innovation is understood and examined extremely thoroughly. J. Schumpeter as an example of innovation enumerated introduction of new product, modification of the present one, implementation of new production method, possession of new sources and possibilities, use of untouched, until now, areas and markets, new means of business organization. (Schumpeter 1932, p. 66) More specific, through the innovation understood opening of new markets where the introduced process, product or service were unknown until this time, use of new means of sales or purchase or the possession and use of new sources of raw materials and semi-finished products. (Schumpeter, 1960, p. 104)

Figure 1 Influence of innovations on the economy



Source: own elaboration on the basis of: Krelle (1989, p. 22).

In this meaning innovation is the new combination of existing possibilities, characterized by high developmental function, first of all in relation to economic condition. (Fagerberg, 2004, p. 6)

Innovation refers to an iterative process of developing commercially successful inventions, whereas innovativeness refers to the orientation of an organization to adopt product, processes, or organizational innovations. (Rodriguez, Wiengarten, 2017, p. 2425)

As Ch. Freeman claimed “not introducing innovations means dying”. (Freeman, 1973, p. 21) In emerging economies, where competition in the industry is fierce, technological innovation is often considered widespread and an effective business method employed by most firms to compete with others. (Cui *et al.*, 2016, p. 29)

Innovativeness of domestic economic subjects is the determinant of the economic condition of the country. Among the effects of the innovation influence it is possible to distinguish increased production, expansion of the present or opening of new enterprises which, in fact, result in the chance of create of new workplaces and decrease of the level of unemployment which leads to the economic growth. (figure 1)

Innovativeness of Indian economy

In the recent years India has appeared as one of the ideal destinations for conduction of international R&D activities. India’s national institutions such as DRDO, ISRO, Defence Research, or the C-DAC have established significant milestones of international standards. Not surprising is the fact that at institutional and governmental levels a great deal of international agreements for cooperation, in the field of scientific research, have been signed. After many years of self-imposed seclusion, ideologically motivated by post-colonial India’s insistence on the development of native technology, deep absorption and successful adaption of imported technology, which has finally led to more than reverse engineering of products development elsewhere, India seems to have joined the international mainstream of innovation. (Herstatt *et al.*, 2008, p. 3)

Current socio-economic condition in the world, constantly changing customers’ expectations and global trends appearing on the market provoked India to the promotion of innovative activities among its domestic economic subjects. Bearing in mind the fact that innovativeness is treated as the driving force of the modern economies, it has been claimed that the future welfare of India in the new economy based on knowledge, to a great extent will be dependent on the ability to generate new ideas, processes and solutions. One of the activities supporting and promoting innovativeness is IIP, which aimed at creation of network associating people and ideas, exchange of experiences and sources, awake innovativeness in Indian society. (*India ...*)

It is also worth to mention about the IIGP which is an exclusive programme of its kind, since it focuses on teaching using world-class commer-

cialization procedures and business development assistance provided. (*About ...*)

In case of creating innovativeness of domestic economy, institutional surrounding constitutes the central issue with government institutions, innovation centres, research centres or institutions financing, supporting and influencing innovative activity of the economic subjects. One of the most important reasons for non-innovativeness is the lack of financial sources. That is why, the role of institutional surrounding, supporting and promoting innovativeness is important for the existence of innovative activity and contributes to creation of new work places, determinates means and effectiveness of the use of employers qualifications which support innovative processes in the economy.. (*Making ...*)

It is worth to mention about NIF in India, which has proved that Indian scientists and innovators can match anyone in the world in case of solving problems creatively. The aim is to assist India become an innovative and creative society and world leader in renewable technologies without social and economic incapability affecting development and spread of green grassroots innovations. (*Mission ...*)

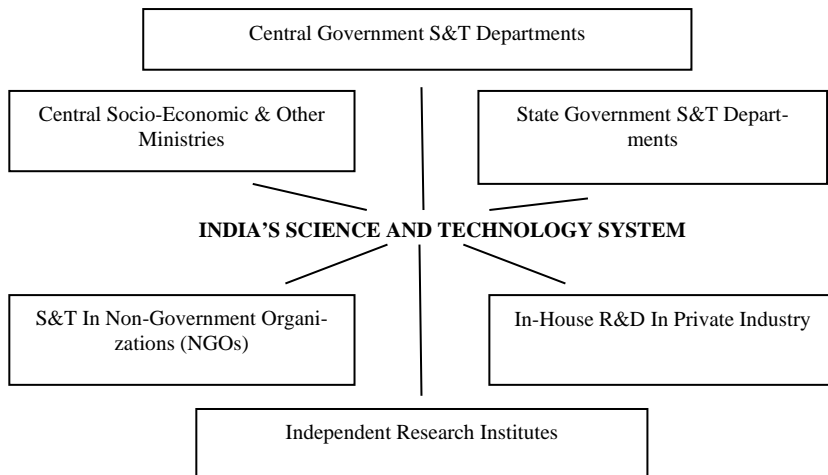
Bearing in mind the fact that innovation is the driving force for the increase of prosperity and national competitiveness in the XXI century, the President of India has announced 2010 as the 'Decade of Innovation'. And India started to develop a national strategy on innovation with particular focus put on Indian model of inclusive growth. The idea is to form an native model of development suited to Indian requirements and challenges. (*India ...*)

One of the most important determinant of innovative capacity is human capital. (Ederer *et al.*, 2007) India has a long tradition of innovations and significant sources of highly qualified people, engaged in innovative activities. India is too poor to buy solutions and technologies from the West. It should be emphasized that poverty does not constitute a barrier, but it is considered an excellent innovation stimulus. The examples can be multiplied. Nowadays, there is a tablet revolution going through the world – the most popular goods on the computer market are such devices as iPads. In the globalized world the tablet fad appeared also in India, but the price of few hundred dollars was too high. An answer became the Aakash tablet which created, for only 35 USD and is supposed to introduce to digital world for over 220 mln Indian students. Some of the solutions for poor meet with the interest of customers from the richer markets. Approximately 40% of electrocardiographs designed for India, American GE's sell in Europe. (*India ...*)

"India's well-developed R&D infrastructure (...) it's key to success as a leading offshore location." (Kayser) In case of innovativeness of national

economy, the key issue is served by surrounding. In India the basic role falls to the NInC which has elaborated on the following ideas, including the deployment and monitor related to some of the initiatives performed in the past years. Worthy of mention activities taken to improve the innovative capacity of the Indian economy are IIIF and a SEBI-registered venture capital fund, a common projects of NInC, the MHRD and other institutional stakeholders on the propositions like National Talent Search Scheme, Establishing Innovation Centre in each DIET, Mapping of Local History, establishing Meta University and twenty Design Innovation Centres (ODS, NDIN, IITs/NITs) or creating ‘TodFod Jod’ (TFJ) Centres, Global Innovation Roundtable, the NKN. (Herstatt *et al.*, 2008)

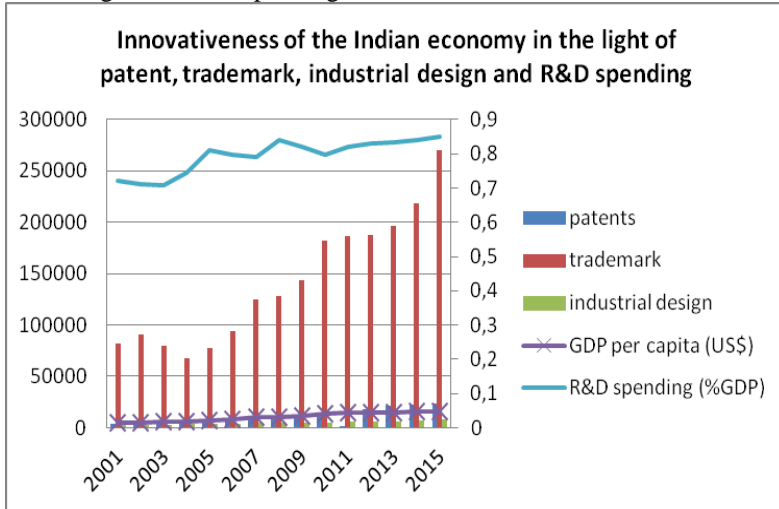
Figure 2 India’s science and technology system



Source: Herstatt, Tiwari, Buse (2008, p. 18).

For the innovative abilities of national economy is also responsible country’s national innovation system. In case of India it is Indian System for Education and Technology which covers units such as Central Government S&T Departments, Central Socio-Economic & Other Ministries, NGOs, In-House R&D In Private Industry and Independent Research Institutes.

Figure 3 Innovativeness of the Indian economy in the light of patent, trademark, industrial design and R&D spending



Source: own calculations based on http://www.wipo.int/ipstats/en/statistics/country_profile/, 10.03.2017, http://www.wipo.int/ipstats/en/statistics/country_profile/, 11.03.2017, <http://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS>, 11.03.2017.

Certainly, innovative capacity is determined by many diverse factors. One of important are R&D activities that result in patents, trademarks or industrial designs. Another important factor is the level of spending on such activities. As mentioned above, innovation improves the condition of an economy, and one of its best indicator is GDP per capita. (figure 3)

Table 1 Correlation coefficient of patent , R&D spending and GDP per capita in BRICS group (analyzed period 2001-2015)

Country	Correlation coefficient:	
	patents and GDP per capita	R&D spending and GDP per capita
Brazil	0,69	0,8
Russia Federation	0,69	-0,18
India	0,97	0,77
China	0,98	0,97
South Africa	0,47	0,18

Source: own calculations based on http://www.wipo.int/ipstats/en/statistics/country_profile/, 10.03.2017, http://www.wipo.int/ipstats/en/statistics/country_profile/, 11.03.2017, <http://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS>, 11.03.2017.

The use of statistical data and their correlation to the correlation function showed how far the level of GDP per capita depends on the level of R&D spending or the number of patents registered in the country.

A summary of results for all members of the BRICS group for years 2001-2015 was presented in the table 1. It can be seen that the relation between the level of R&D spending and the number of patents registered in India economy is strong, so the upward trend should be continued.

Place and role of India in the world economy

To the group of most innovative, the best developed and the most competitive economies in the world including Denmark, Finland, Singapore, Sweden, Switzerland or USA. India ranked on 39 place in GCI 2016-2017. India is better off in regional terms. In the Central and Southern Asia, India has a leadership position.

However, from the 90s of the previous century India notes dynamic economic growth with enormous military potential, including nuclear weapons. In 2008 India sent spaceship to the Moon, built by own resources. Financial provisions of India, in April 2011, grown to the level of 303,5 mld USD. (Makles, 2011)

Table 2 Competitiveness of Indian economy according to World Economic Forum in terms of chosen factors responsible for innovativeness, on the basis of BRICS group, in 2013* and 2016**

	India	China	Brazil	Russia Federation	South Africa
Factor	Rank in GCI 2013-2014/Rank in GCI 2016-2017				
Capacity for innovation	42/39	23/45	34/92	56/78	41/25
Quality of scientific research institutions	39/36	44/40	46/86	70/46	34/29
Company spending on R&D	37/28	24/25	33/74	79/66	39/30
University-industry collaboration in R&D	51/24	35/30	44/90	85/46	30/27
Availability of scientists and engineers	16/36	46/30	113/111	90/58	122/112
FDI and technology transfer	44/54	77/59	24/63	135/111	38/52
Firm-level technology absorption	40/81	71/60	47/65	141/86	38/22
Availability of latest technologies	47/78	107/81	50/85	129/83	39/44
Technological readiness	96/110	88/74	48/59	57/62	62/49
Innovation	41/29	33/30	49/100	85/56	42/35

Analyze of *144 countries ** 138 countries

Source: own analysis on the basis of: Schwab (2013, pp. 116-117, 138-139, 216-217, 304-305, 325-326), Schwab (2016, pp. 147, 203, 127, 307, 325).

Table 2 presents situation of India on the basis of other countries forming BRICS group. It can be noticed that situation of India is diversified.

The economy performs the best, on the international arena in terms of availability of highly qualified scientists and engineers.

Table 3 Indian innovativeness (GII) and competitiveness (GCI) on the basis of BRICS group in 2012 and 2016

Country	GII		GCI	
	Rank in 2012	Rank in 2016	Rank in 2012	Rank in 2016
Brazil	58	69	48	81
Russia Federation	51	43	67	43
India	64	66	59	39
China	34	25	13	28
South Africa	54	no data	52	47

Source: *The Global Innovation Index 2016*, <https://www.globalinnovationindex.org/gii-2016-report#>, 22.03.2017; Schwab (2012, p. 13), Schwab (2016, p. 7).

Worth attention seems to be the analysis of its competitiveness in relations to indicators building innovative abilities and at the same time condition of national economy, such as institutional surrounding, infrastructural back office, situation on the work market or the size of the market. Examining place and role of Indian economy in the world economy it is important to mention the issue of economic competitiveness. One of the prominent criteria seem to international competitiveness exposed on background of BRICS. (table 3)

In the competitiveness rankings according to the index of GCI WEF, India in relation to other countries forming BRICS group, holds 59th place out of 144 economies from the whole world, after China and Brazil but before Russian economy. The much better result India reached in 2016, rising by 20 positions in the top of the ranking. (Schwab, 2016)

Conclusion

Taking into consideration the most innovative economies in the world as well as their level of development it seems legitimate to state that innovativeness of national economies conditions also competitive position of those countries on the international arena.

India in comparison to the narrow circle of leaders in terms of innovativeness emerges rather weak. Even though, situation of Indian economy seems to be successful and develops in the right direction. Taking lower places in the competitive and innovative ranking, India can be proud of the human capital. Not many countries dispose such a big number of highly qualified staff, which performs R&D activities and at the same time develops various types of innovations. Moreover, India is perceived as one of the fastest developing economies in the world. They reach the highest economic growth, and as it is forecasted that in 2050 Indian economy will be one

of the biggest and influential economic powers. It is significant that it will be influenced by the innovative activity.

India and whole BRICS lately have been out of favor as the major driver of global growth (Fedoseva, Zeidan, 2016, p. 237) Moreover, member of BRICS and their cooperation has been driven not only by economic and political determinants, but also the failure of the existing global economic governance framework to satisfy the real needs of these countries. BRICS as the emerging leading powers in the world have great influence on the world development (Tian, 2016, p.111; Shen *et al.*, 2017, p. 19) India has a significant share in this.

Developing and advanced countries that aspire to become emerging economies have to use all the options available to them to improve their technological performance. (Greenhalgh, 2016, p. 114)

The best attributes of Indian economy are: (*Rynek ...*)

1. Dynamic and competitive private sector which constitutes 75% of Indian GDP and offer wide range of cooperation;
2. Huge and constantly developing consumer market;
3. Considerable resources of English speaking workforces both among the managing staff and technical employees who can achieve the title of the best in the world;
4. Concept of Indian family, elaborated through centuries, which prove to be successful in the contemporary world, in terms of companies it allows to reach effective management and long term planning.

Indian economy currently develops in a rapid pace (6-7% annually), which carry considerable investment needs, and quickly growing and westernizing middle class create additional demand for the consumption goods. Most importantly, it fulfills the expectations of its customers by offering much cheaper innovations, not at lower quality.

If the direction of the Indian economy would be sustained, the growth trend could be maintained, and thus the socio-economic improvement in the country would be improved.

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