

THE BLOOMBERG INNOVATION INDEX AS A TOOL TO MEASURE ECONOMIC GROWTH

Radosław WOLNIAK^{1*}, Michalene Eva GREBSKI²

¹ Politechnika Śląska, Wydział Organizacji i Zarządzania, rwolniak@polsl.pl

² Northampton Community College – Monroe Campus, USA

* Correspondence author: rwolniak@polsl.pl; tel.: +48534538177

Abstract: The problem of innovation and innovativeness of economy is very important in nowadays economy. The main problem is how to measure the level of innovativeness, because there are many ways to do it. One of the ways of this is to use complex innovative Indexes as described in this publication Bloomberg Innovative Index. The aim of the publication is to analyze the sub-indexes in the Bloomberg Innovation Index from innovativeness point of view.

Keywords: innovativeness, innovation, innovation index, business indexes, economic growth.

1. Introduction

The innovation is one of the most essentials elements of creating a competitive advantage of an industrial enterprise (Carlson, and Sullivan, 1999; Feisel, and Rosa, 2015; Grebski, and Wolniak, 2016; Kyaga et al., 1999). Gaining a high quality of produced goods can't be achieved without innovation, using new solutions and technologies (Dolińska-Weryńska, 2017; Kochmańska, 2017; Krzemień, and Wolniak, 2016; Knop, and Brzóska, 2016; Knop, and Olko, 2017; Michna, and Kmieciak, 2014). The contemporary global economy based on knowledge requires from a company to follow constantly clients' needs and adjust its products to his requirements (Pichlak, 2016; Pichlak 2017; Olkiewicz et al., 2017a; Olko, 2017; Michna, and Kmieciak, 2014; Wolniak, and Grebski, 2018a; Wolniak, and Grebski, 2018b; Wolniak, and Grebski, 2018c; Skotnicka-Zasadzień, and Wolniak, 2017). Knowledge and innovations have been in the center of the UE interest since 2000 when the transformation of the UE economy into the most competitive and dynamic economy in the world became the major aim in Lisbon's strategy.

Therefore, all the enterprise's departments should be constantly improved by means of a constant improvement (Wolniak, and Skotnicka-Zasadzień, 2014; Wolniak, 2016a;

Wolniak, 2016b; Wolniak, 2017a; Wolniak, 2017b; Wolniak, and Grebski, 2017). It requires a permanent, constant improvement of all process in the organization (Wolniak, 2014; Wolniak, 2010; Wolniak, and Sędek, 2009, Bober et al., 2017; Restecka, and Wolniak, 2016). However, it should be remembered that the process of improvement requires an appropriate leader, a company's culture and an implementation of methodological conduct. Innovation of economy in particular industry is an important element of competitive advantage whose acquisition conditions the success of Polish organizations on the European and worldwide market (Ober, and Karwot, 2017; Szwajca, 2016; Osika, 2016; Jonek-Kowalska, 2011; Kozubek, 2016; Orbik, 2017).

The aim of the publication is to analyze the sub-indexes in the Bloomberg Innovation Index from innovativeness point of view.

2. The Bloomberg Innovation Index as a tool to measure economic growth

The methods used to measure and compare economic growth were part of The Bloomberg Innovation Index (economist, 2018) which analyzes data from the following sources.

World Bank

The World Bank's mission is to end extreme poverty and promote share prosperity.

International Monetary Fund (IMF)

IMF's mission is to promote global cooperation, financial stability, facilitate trade, decrease unemployment, promote sustainable growth and reduce poverty.

World International Property Organization (WIPO)

WIPO's mission is to provide a global forum for intellectual property services, policy, information and cooperation.

U.S. Patent and Trademark Office (USPTO)

USPTO's mission is to foster innovation, competitiveness and economic growth domestically and abroad to deliver high quality and timely examination of patent and trademark applications and policy.

Organization for Economic Co-operation and Development (OECD)

The OECD Centre was established in 1961 as an independent platform for knowledge sharing and policy dialogue between the Organization for Economic Cooperation and Development

member countries, so that, they can interact on an equal footing. Poland is one of the twenty-seven OECD. The United States is neither one of the twenty-seven member countries nor one of the twenty-four OECD non-member countries as of July 2015.

The OECD uses evidence-based analysis and strategic partnerships to help countries formulate innovative policy solutions. Poland joined the OECD in 1996. Poland joined the European Union on May 1, 2004.

United Nations Education and Science Co-operation Organization (UNESCO)

UNESCO's mission is to advance the understanding of the peoples, provide a fresh impulse to education and to maintain, increase and disseminate knowledge.

The Bloomberg Innovation Index uses an annual ranking of how innovative the companies are. It measures six criteria. (Bloomberg ranked countries based on their overall ability to innovate. It identified the top 50. Six equally weighted metrics were considered and their scores combined to provide an overall score for each country from zero to 100 (bloomberg, 2018).

3. Research and Development as a method to measure economic growth

South Korea, No. 1 in this category, is proof that countries can lift themselves through a combination of government support and private enterprise. In South Korea, research-intensive companies led by Samsung, have modernized the whole economy. In many countries, such as France, scientists who are government employees working in prestigious institutes have little incentive to commercialize their work, so the public is slow to benefit, says Bronwyn Hall, a professor emeritus of economics at the University of California-Berkeley. Hall says a more efficient tech-transfer model is America's National Science Foundation, which makes 94 percent of its research grants to people in university labs and companies.

4. Manufacturing as a method to measure economic growth

Manufacturing industries accounted for 68 percent of the Research and Development of US businesses in 2011, the last year for which data is available, according to the National Science Foundation. But not all manufacturing is equally innovative – think potato chips vs. computer chips. Bloomberg's measure focuses on the value added by manufacturing which

boosts the ranking of countries. It focuses on products like pharmaceuticals, autos and computers. Switzerland, home of pharmaceutical giants Novartis and Hoffmann-La Roche, ranks first. China, by contrast, lags at 41st.

(Number of domestic high-tech public companies – such as aerospace, defense biotechnology, hardware, software, semiconductors, Internet software/services and renewable energy companies as a share of the world's high-tech public companies).

This is the one category in the ranking that is not adjusted for the size of the economy or population, so it is no surprise that the US has nine out of the top ten high-tech companies. The United States finishes in first place in comparison to all other countries, substantially boosting its overall ranking. You can argue that this factor is unfair to small nations. But there is something to be said for the sheer innovative power of America's huge high-tech sector which ranges from Google to Lockheed Martin to Monsanto. The ten largest high-tech companies, by market capitalization (as of January 16, 2017) are described in Table 1.

Table 1.

Ten top high-tech companies worldwide as of January 16, 2017.

Country of Origin	High-tech Company	Market Capitalization (B = Billion)
United States	Apple	\$625 B
United States	Microsoft	\$377 B
United States	Google	\$342 B
United States	Facebook	\$210 B
United States	Oracle	\$189 B
United States	Intel	\$175 B
United States	IBM	\$154 B
China	Tencent	\$147 B
United States	Cisco	\$141 B
United States	Qualcomm	\$118 B

Source: Bloomberg Innovation Index (Bloomberg, 2017).

5. Postsecondary Education as a method to measure economic growth

(Number of secondary graduates enrolled in postsecondary institutions; percentage of labor force with degrees; annual science and engineering graduates as a percentage of the labor force and as a percentage of total graduates).

This category measures the education levels of a country's workforce. South Korea comes out on top overall, and those at the bottom include Pakistan, Kenya, Brazil, and Indonesia, which struggle to achieve minimum levels of education. While education may be necessary for innovation, it is clearly not sufficient. Russia, second overall, has an illustrious tradition in science and math, but innovation is not a national strength. Corruption and red tape, among other roadblocks to innovation, prevent economies which cannot generate enough jobs to employ all college graduates.

6. Research Personnel as a factor to measure economic growth

Finland is No. 1 in this category. After Nokia's had problems with their mobile phones, Finland diversified and made better use of its engineering talent. The hottest new sector is gaming, exemplified by Angry Birds. Iceland, Denmark, Israel, and Singapore (all small, prosperous nations) are also in the top five. Smaller countries tend to have more open economies. They export and import more goods. Free trade allows them to carve out research centers. Iceland is a leader in genomics, Denmark in pharmaceuticals, Israel in software, and Singapore in electronics. For less-developed countries, innovation takes the form of smart adoption and adaptation of technologies developed elsewhere.

7. Patents as a method to measure economic growth

(Resident utility patent filings per 1 million population and per \$1 million of research /development and patents granted as a percentage of the world total.)

Patents protect and encourage inventiveness by allowing patent holders to exclude others from using their intellectual property and inventions. However, patents prevent new inventors from building upon existing technologies. Countries whose residents earn a lot of patents (and attract patent lawsuits) tend to be those at the frontiers of science and technology.

All six categories are shown in Table 2. A country's overall rank is the average of the six measures.

Table 2.

Rankings of total (resident and abroad intellectual property filing activity by origin 2015)

Method of Measurement	Poland's Rank	United States' Rank
Overall Rank	25	6
Research and Development	24	1
Manufacturing	23	1
Hi-tech Companies	25	2
Education	31	7
Research Personnel	30	1*
Patents/Trademarks/Designs	24/20/15	2/2/4

Source: World Intellectual Property Organization, 2016; The Bloomberg Innovation Index, 2017.

The United States has the top 4 research universities which are Stanford University, Harvard University, University of California and Georgia Institute of Technology. The Pennsylvania State University ranked 47th. Jagiellonian University and the University of Warsaw ranked 401 out of the top 500 research universities worldwide.^{2.19}

Of the more than 200 countries evaluated, 69 had data for all six metrics. The ranking shows only those countries included in the top 50. Most recent data available were used.

Ranking of the more than 200 countries evaluated, 69 had data for all six metrics. The ranking shows only those countries included in the top 50. Most recent data available were used. Ranking sources were Bloomberg, International Monetary Fund, World Bank, Organization for Economic Co-operation and Development, World Intellectual Property Organization, United Nations Educational, Scientific and Cultural Organization. Other sources included Samsung, Swiss Federal Statistical Office and Unified Patents.

This data identifies how innovation can help companies and governments who would like to reproduce the intellectual property or to use the best practices of the top countries.

8. Conclusion

The Bloomberg Innovation Index also indicates a missing measurement which is government regulation. The missing measurement either accelerates or impedes the adoption of new ideas. Politicians and regulators are often wary of change. Audi CEO, Rupert Stadler, says that because of strict driving rules in Germany, his company has conducted its work on new automated systems in the US, where "there is more freedom and liberty to do it". Uber, the mobile app that connects drivers and riders, is another example of how governments approach to innovations can threaten the existing order. Taxi drivers all over the world hate Uber. In the US, customer demand has mostly overwhelmed attempts by cities and states to stop the company from operating. But France has banned one of its services. The best thing a government can do to promote innovation is get out of the way.

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