

Modification Innovation Index in Global Economy

Radjabov Ozod, Eshmatov Suhrobjon

Abstract— The global economic recovery is now more sustained and broadbased than it was when we released the Global Innovation Index (GII) last year. The challenge today is to overcome a number of remaining obstacles and to spur sustainable growth and employment throughout the world. As in previous reports, the GI relies on two sub-indices—the Innovation Input Sub-Index and the Innovation Output Sub-Index—each built around pillars.

Index Terms— modification, economy, innovation, index, obstacles, output, challenge, sustainable growth.

1 INTRODUCTION

The global economic recovery is now more sustained and broadbased than it was when we released the Global Innovation Index (GII) last year. The challenge today is to overcome a number of remaining obstacles and to spur sustainable growth and employment throughout the world. As in previous reports, the GI relies on two sub-indices—the Innovation Input Sub-Index and the Innovation Output Sub-Index—each built around pillars. Four overall measures are calculated: the GI, the Input and Output Sub-Indices, and the Innovation Efficiency Ratio (Figure 1).

The Innovation Input Sub-Index: Five input pillars capture elements of the national economy that enable innovative activities:

- Institutions;
- Human capital and research;
- Infrastructure;
- Market sophistication;
- Business sophistication;

The Innovation Output Sub-Index: Innovation outputs are the results of innovative activities within the economy. There are two output pillars: Knowledge and technology outputs and Creative outputs. The overall GI score is the simple average of the Input and Output Sub-Indices.

2 PROCEDURE FOR PAPER SUBMISSION

2.1 Review Stage

The Innovation Efficiency Ratio is the ratio of the Output Sub-Index over the Input Sub-Index. It shows how much

innovation output a given country is getting for its inputs.

Each pillar is divided into three sub-pillars and each sub-pillar is composed of individual indicators, for a total of 81 indicators. This year the GI model includes 143 economies, representing 92.9% of the world's population and 98.3% of the world's GDP (in current US dollars).

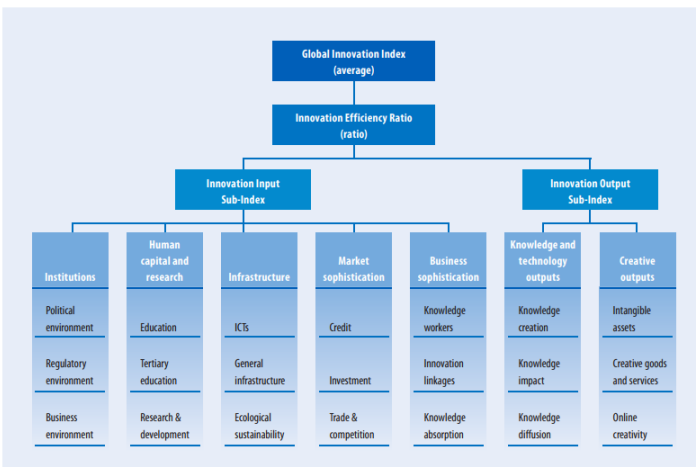
2.2 Final Stage

The 143 economies and 81 indicators presented in the GI 2014 cover a range of themes, presenting us with a rich dataset to analyze global innovation trends.

Stability at the top as expected, there is relative stability in the top 10: Switzerland leads again in 2014, the United Kingdom (UK) takes the second spot, and Finland makes it into the top five. The USA (6th) declines by one spot this year. Except for one change, the top 10 ranked economies in the GI 2014 remain the same as in 2013. Luxembourg (ranked 12th in 2013) enters the top 10 at 9th position, pushing Ireland just over to 11th position in 2014.

Switzerland
United Kingdom (UK)
Sweden
Finland
Netherlands
United States of America (USA)
Singapore
Denmark
Luxembourg
Hong Kong (China)

- Radjabov Ozod
- Eshmatov Suhrobjon



2.3 Figures

Figure 1. Framework of the Global Innovation Index 2014

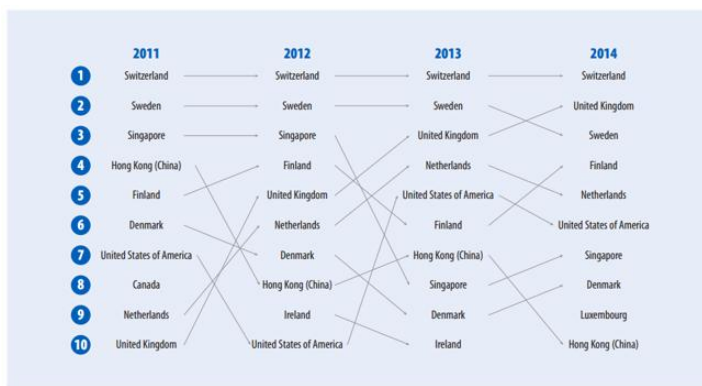


Figure 2. Movement in the top 10 of the GII

3 SECTIONS

The top 10 economies in the GII 2014 edition are Switzerland, the UK, Sweden, Finland, the Netherlands, the USA, Singapore, Denmark, Luxembourg, and Hong Kong (China). Nine of these economies were already in the GII top 10 in 2013; Ireland, which was in the top 10 in 2013, dropped to 11th place this year, and Luxembourg climbed up into the top 10 from 12th position in 2013. Singapore is ranked 7th, up one position from 2013, and is one of the five economies at the efficient frontier as well as the leading economy in Asia. It shows strength across the board in the Input Sub-Index, where it takes 1st place: Business sophistication (1st), Human capital and research (2nd), Infrastructure (2nd), Market

sophistication (4th), and Institutions (6th). But it ranks only 25th in

the Output Sub-Index, a result of its 13th place in Knowledge and technology outputs and 33rd place in Creative outputs. As a result, Singapore has the lowest efficiency ratio of the top 10 (110th—albeit an improvement from 121st in 2013). And Singapore has the lowest efficiency ratio of the top 10. Singapore has a leading position (within the top 25) in 6 out of 7 pillars (including 1st in Business sophistication) and 16 out of 21 sub-pillars, ranking 1st in 3 of them: Regulatory environment, Business environment, and Knowledge absorption. Singapore performs less well in government expenditure on education (111th), communications, computer and information services exports (96th), domestic resident trademark applications (82nd), and printing and publishing output (73rd).

Hong Kong (China) is ranked 10th this year, down three positions from 7th in 2013 and losing the lead among Asian economies to Singapore. With a population of 7.2 million and a GDP per capita of PPP\$52,722.0, its major leverage comes from the Input Sub-Index, where it ranks 2nd after Singapore. The economy takes 1st place in Infrastructure, 3rd in Market sophistication (coming after the USA and the UK), and includes top positions in the Ecological sustainability, Credit, and Knowledge absorption sub-pillars. On the input side, its relative weakness is in Human capital and research (although still a very good 23rd position). Its less good showing in the Output Sub-Index, where it ranks 24th (down from 15th in 2013), is the result of a worsening position in the key Knowledge and technology outputs pillar (45th this year); this is, however, compensated for by a 6th place in Creative outputs. At the indicator level, Hong Kong (China) achieves 1st place in 10 indicators. Its major weaknesses are in the Knowledge diffusion sub-pillar (80th), with poor performances in high-tech exports less reexports (101st) and communication, computer and information services exports (103rd). Other areas of concern are the Education sub-pillar (57th), with weaknesses in government expenditure on education (97th), government expenditure per pupil in secondary education (70th), and pupil-teacher ratio in secondary education (75th).

The top 10 in the Innovation Input Sub-Index

The Innovation Input Sub-Index considers the elements of an economy that enable innovative activity through five pillars. The top 10 economies in the Innovation Input Sub-Index are Singapore,

Hong Kong (China), the UK, the USA, Finland, Sweden, Switzerland, Canada, Denmark, and Australia. Canada and Australia are the only economies in this group that are not also in the GII top 10.

4 CONCLUSION

The Innovation Output Sub-Index: Innovation outputs are the results of innovative activities within the economy. There are two output pillars: Knowledge and technology outputs and Creative outputs. The overall GII score is the simple average of the Input and Output Sub-Indices.

REFERENCES

- [1] J.S. Bridle, "Probabilistic Interpretation of Feedforward Classification Network Outputs, with Relationships to Statistical Pattern Recognition," *Neurocomputing—Algorithms, Architectures and Applications*, F. Fogelman-Soulie and J. Hérault, eds., NATO ASI Series F68, Berlin: Springer-Verlag, pp. 227-236, 1989.
- [2] W.-K. Chen, *Linear Networks and Systems*. Belmont, Calif.: Wadsworth, pp. 123-135, 1993.
- [3] H. Poor, "A Hypertext History of Multiuser Dimensions," *MUD History*, <http://www.ccs.neu.edu/home/pb/mud-history.html>. 1986.