Economic Impact of Internet and Information Development on Countries along the Belt and Road Route

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Abstract. With the rapid growth of global network users’ number and scale and the further development of the Internet industry, information technology more and more become a significant power for a country’s economic boom. This paper carefully studied how can information technology help support the economic development on countries along the Belt and Road route. Studying by econometrics method, the research shows that industrial sector still has been played a key role in driving the economy forward of countries along the Belt and Road. While the thriving of information technology also has enjoyed an increasingly important status in the economic growth process and is significantly positively correlated with the economic growth. In conclusion, the development and application of information technology in the countries along the Belt and Road route is of great significance to measure the countries’ improvement of social and economic development.

Keywords: Internet and Information Technology, the Belt and Road Initiative, Economic Growth

1. Introduction

The Belt and Road Initiative-the BRI-is the “silk road economic belt” initiative and “21st century maritime silk road” initiative, which were submitted by president Xi Jinping in the year of 2013. The BRI aims to establish a global framework which is all-round, multi-level and vigorous for developing countries. Put another way, the framework also refers to the “five links” which provide a convenient channel for improving communication among leaders of nation and government, enable many other countries to strengthen the building of infrastructure and facilities, and foster trade circulation, financial inclusion and cultural exchanges.

Since 2013, the construction of the BRI has made rapid progress and attracted high attention from the international community. Several reasons follow. Firstly, a lot of countries have joined the BRI and believe that it has a bright prospect. As of December 2018, the Chinese government successfully built diplomatic relationship with those countries and more such as signed one hundred and seventy cooperation documents. Specifically, those countries spread all over Asia, Latin America, European and so on, adding up to with around 122 states and 29 global institutions. Secondly, along with the fast thriving of internet and information technology that has risen in popularity, the technology has made a significant impact on information industry development, economic growth and its growth mode of
countries around the world. In addition, the booming of information technology is also able to help promote industrial structure upgrading and promote comprehensive, balanced and sustainable economic development in a positive fashion. What is more, countries joined the BRI have enjoyed rapid growth in infrastructure development, mainly reflected in the ports, railways, highways, electric power, aviation and communications. For example, Internet services as a role in constructing the “Internet + logistics”, “Internet +” and “energy Internet” and so on for the relevant countries. Finally, domestic and foreign media and netizens keep paying more and more attention to the topic of the BRI. According to big data statistics, 21 of the top 50 countries are countries which think positively of the BRI. Meanwhile, positive emotions of foreign media and netizens towards the BRI have increased from 16.3% in 2013 to 23.42%. However, few existing literatures use empirical methods to demonstrate how information technology has played its part on socio-economic development [1-4].

At the moment, the number and scale of global network users are growing rapidly, and the Internet industry is developing in depth. Internet technology and information technology are becoming more and more important forces driving a country’s economy, exerting a profound impact on its production and circulation. In this background, this paper focuses on how can information technology progress help boost economic development all the way along the countries joined the BRI, carefully discusses the key role of information technology in those nations, and whether development conditions as well as application results of the technology play a positive role in promoting socio-economic boom in countries discussed herein [5].

2. Application of Information Technology

Information technology is fully known as information communication technology-the ICT-also known as informatization. In a narrow sense, ICT includes investment in computers, communication equipment and software. In a broad sense, ICT also includes broadcasting and television equipment, household audio-visual equipment, electronic instrument manufacturing, etc. At present, a number of institutions around the world release various data indicators to evaluate the development of information technology in a country. Report on ICT core indicators issued by the ICT partnership for development. The digital access index, information opportunities index and information development index are issued by the international telecommunication union and other organizations.

The Global Information Technology Report launched the Networked Readiness Index (NDI) which released by the world economic forum. The network readiness index measures the ICT development level of each country from four aspects. The first is environmental indicators, which mainly assess the friendliness of a country's laws and markets to the ICT industry from the perspective of government regulation and business innovation. The second is the readiness index, which evaluates a country's readiness to apply ICT, such as mobile network coverage, Internet and telephone competition index and adult literacy level, mainly in terms of infrastructure, price tolerance and application skills. The third is the application index, which mainly evaluates the application of ICT by social subjects from the level of individuals, enterprises and governments, such as the use of social network, the technology absorption at the level of enterprises, and the importance of ICT to the government in the future. The fourth is the impact indicators, mainly considering the impact of ICT on the economy and society, such as employment in knowledge-intensive industries and electronic participation index. In summary, the network readiness index, or the NRI, assesses the development and application of ICT in a country. It is of positive significant reference to measure the improvement of socio-economic growth level of nations due to the use of the ICT and to examine the adjustment and innovation of ICT applied by a country's government [6-9]. Therefore, this paper uses the NRI index to analyze and investigate the information technology capability of countries discussed herein.

3. Economic Impact of Information Technology on Countries Joined the BRI

Considering the availability of data, the paper selects the Networked Readiness Index data and country rankings of 55 countries (including China) joined the BRI in 2016, as shown in Table 1. From the ranking data, Table 1 lists the top 10 countries in the “network readiness index” of countries which
have been discussed herein. However, among the 139 countries published by the world economic forum, only high-income developed countries like Singapore, Japan and South Korea rank top 20. In terms of NDI values, nine countries have NDI values above 5.0. Therefore, there are not many countries with a high level of information technology development along the BRI countries, and most of those states and regions are in the midst of medium or less developing income levels. On the other hand, it also reflects that those countries still have huge development potential and space in the field of information technology development.

**Table 1.** The NRI of BRI countries in 2016.

| Nation                  | Numerical number | Ranking |
|-------------------------|------------------|---------|
| Singapore               | 6                | 1       |
| Japan                   | 5.6              | 10      |
| Republic of Korea       | 5.6              | 13      |
| Israel                  | 5.4              | 21      |
| Estonia                 | 5.4              | 22      |
| United Arab Emirates    | 5.3              | 26      |
| State of Qatar          | 5.2              | 27      |
| The kindom of Bahrain   | 5.1              | 28      |
| Lithuania               | 4.9              | 29      |

What are the economic implications of the network readiness index for BRI countries? In this paper, we use empirical methods which is ordinary least squares linear regression to study whether there is a linear relationship between national gross domestic product and the Networked Readiness Index. The result shows that the coefficient of NRI value of 0.875, and the positive significant at the 5% level, shows that the improvement of information technology development of those countries' level of economic development play a positive role. NDI index comprehensively investigates the development of information technology in a country. As mentioned above, NDI index comprehensively considers four secondary indexes including environment, readiness, application and influence. Therefore, NDI is taken as the explained variable in this paper, and ordinary least squares linear regression is made for the other four indexes as the explanatory variables, and table 2 is obtained. As can be seen from table 2, the environmental indicator coefficient is significantly positive at the 10 per cent level, while the correlation coefficients of both the readiness application indicator and the impact indicator are significantly positive at the 1 per cent level. This indicates that the higher the indicators of environment, readiness, application and impact, the greater the impact on the progress of information technology, and the level of ICT application readiness, the application of ICT by individuals, enterprises and governments, and the socio-economic impact of ICT contribute more to the progress of information technology [10-13].

**Table 2.** OLS Regression Results for NDI.

| Variables | OLS_NDI       |
|-----------|---------------|
| Environment | 0.00255* (0.00131) |
| Readiness    | 0.215*** (0.0180)  |
| Usage        | 0.348*** (0.0326)  |
| Impact       | 0.333*** (0.0330)  |
| __cons       | 0.471*** (0.0627)  |
| N            | 55             |
| adj. R2      | 0.992          |
Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

For the sake of more robust research findings, this paper also uses the personal network utilization rate as the embodiment of the development of information technology to further carry out the research. The data of personal network utilization rate of countries discussed herein are from the world bank database. Considering that much more than half of the BRI countries are striving for moving from medium or less developing economies to well-off societies and more and industrial development is still the main force driving economic growth forward, so this paper also adds the power consumption factor. Similarly, with GDP as the explained variable and electricity consumption and personal network utilization as the explanatory variables, data from 2013 to 2015 were selected to form a small panel data. After taking the logarithm of GDP and electricity consumption data, ordinary least squares linear regression was performed, and table 3 was obtained. The regression results show that electricity consumption and GDP are significantly positive at 1% level, and electricity consumption is closely and positively correlated with the economic growth of countries along the Belt and Road. Personal network utilization is significantly positive with GDP at 1% level, indicating that personal network utilization is closely and positively correlated with the economic growth of the BRI countries. However, the regression coefficient of power consumption is much larger than that of personal network utilization, which is also consistent with the fact that most countries discussed herein have a weak economic development level. Industrial development is still playing a key role to strengthen economic growth, and the development of information technology is also an important force driving economic development.

| Variables | OLS GDP          |
|-----------|------------------|
| Inele     | 0.289***         |
|           | (0.0562)         |
| internet  | 0.00171**        |
|           | (0.000819)       |
| _cons     | 5.265***         |
|           | (0.460)          |
| N         | 198              |

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4. Conclusion
With the rapid growth of global network users’ number and scale and the further development of the Internet industry, information technology more and more become a significant power for a country's economic boom. This paper carefully studied how can information technology help support the economic development on countries which have been joined the BRI. Studying by econometries method, we find that the industrial industry has played a key role in driving economy forward for the BRI countries. While the development of information technology also has enjoyed an increasingly pivotal development status in the process of economic growth and is significantly positively correlated with economic growth. In addition, the effectiveness of a country's it development can be evaluated from four aspects: the first is national environmental indicators, namely, the friendliness of a country's laws and markets to the ICT industry; the second is Readiness indicators ranging from infrastructure, price affordability to ICT application skills; the third is Indicators of application, the use of ICT at the individual, business and government levels; the final one is Impact indicators, that is the economic and social impact of ICT\cite{14}. In conclusion, the development and application of information technology in the BRI countries is of great significance to measure the improvement of socio-economic level of those countries through the use of ICT.

References
[1] Jianguang Z, Jianming Z. Trends of informatization development from the global information technology report 2015 by the world economic forum [J]. E-government, 2015(10):115-122. (in Chinese)

[2] Yongyang T. On the relationship between network economy, information economy and e-commerce [J]. Business news, 2019(28):183. (in Chinese)

[3] Min W, Qinmei W, Jiaping Z, Ning H. Empirical analysis of the relationship between Internet, economic growth and power consumption [J]. Statistics and decision-making, 2016(17):109-111. (in Chinese)

[4] Mazbahul Golam Ahamad, A.K.M. Nazrul Islam. Electricity consumption and economic growth nexus in Bangladesh: Revisited evidences [J]. Energy Policy, 2011, 39(10).

[5] Larsson R, Lyhagen J, Lothgren M. Likelihood-based cointegration tests in heterogeneous panels [J]. Econometrics Journal, 2001, 4.

[6] Apergis N, Payne J E. A dynamic panel study of economic development and the electricity consumption-growth nexus [J]. Energy Economics, 2011, 33(5):770-781.

[7] Jinwen Z, Jitao F. Empirical study on the relationship between economic growth and internal compliance of energy consumption [J]. Economic research, 2007(08):31-42. (in Chinese)

[8] Xinqiao P. Economic influence and market structure of Internet [J]. World economy, 2001(02):52-53. (in Chinese)

[9] Xuefei Y. The influence of network economy on modern economic development in the Internet era [J]. Management and technology of small and medium-sized enterprises (mid-october), 2019(11):103-104. (in Chinese)

[10] Linlin S, Haitao Z, Ruoen R. Contribution of informatization to China's economic growth: empirical evidence of industry panel data [J]. World economy, 2012, 35(02):3-25. (in Chinese)

[11] Yanting L, Kewei Y. Current situation and prospect of Internet development in countries along the “Belt and Road” [J]. Ict and policy, 2018(09):16-21. (in Chinese)

[12] Erhui W, Kai L, Guoqing H, Xin D. Analysis on operation and maintenance technology of smart distribution network based on “Internet +” [J]. Science and technology communication, 2020, 12(02):120-121. (in Chinese)

[13] World Economic Forum. The Global Information Technology Report 2015[R/OL]. Geneva: World Economic Forum, 2016.

[14] Jiapei W. The relationship between informatization and industrialization [J]. Economic research, 1993(12):70-71. (in Chinese)