ATLANTIS PRESS

Advances in Economics, Business and Management Research, volume 108

5th IPMA SENET Project Management Conference (SENET 2019)

Development opportunities for growing economies on the routes of New China's Silk Road: case study of Serbia

Jovanka Šaranović
The Strategic Researches Institute
University of Defence
Belgrade, Serbia
jovanka.saranovic@mod.gov.rs

Nataša Stanojević
College "Dositej"
Belgrade, Serbia
natasa1171@gmail.com

Dejan Vuletić
The Strategic Researches Institute
University of Defence
Belgrade, Serbia
dejan.vuletic@mod.gov.rs

***Abstract* - This paper examines the impact of Chinese investments in infrastructure facilities within the New Silk Road on the growing economies of the host countries. Using Multivariate Analysis method, the impact of Chinese and total FDI on several key economic indicators of Serbia are measured separately and compared. The statistical procedure includes two tests of the statistical significance of the estimated correlation: P-value, as a part of Multiple Variable Analysis, and F-test, which is commonly used for small samples. The results show a much stronger and more positive impact of Chinese investment than total FDI but also point to the direction of a change, such as increasing of import of goods and services, the reduction of unemployment and the increase in the employment rate, as well as the degree of openness of the economy.**

Keywords - New Silk Road, Chinese investment, Infrastructure, Serbia.

I. INTRODUCTION

Infrastructure is one of the key requirement for the economic and overall development of a country. Infrastructural shortcomings are almost a general problem of less developed countries, and even in medium-developed countries it is a common occurrence. Thus, a weak infrastructure can be observed, at the same time, both as the cause and effect of a weak economy.

The condition of the infrastructure in growing economies cannot be sufficiently improved by internal resources. These are usually countries with a general lack of capital, slow growth, numerous structural weaknesses and budget deficits, which indicates that foreign investment in infrastructure is required.

At the same time, the impressive economic rise of China, mainly based on exports and investments, has created a need for new, more efficient transport routes to the West. The concept of the traditional Silk Road as a network of infrastructure connections has been renewed.

The National Development and Reform Commission of China in 2015 [1] presented the detailed strategy of this gigantic supra-national infrastructure projects, include railway (standard and fast), land and maritime roads, ports and airports, infrastructure facilities related to energy - hydroelectric power plants, dams, oil pipelines, gas pipelines and electric lines. In the latest phase, New Silk Road included the development of economic corridors, industrial parks, duty-free zones, and the like.

Interests of China and countries with poor infrastructure performance are obviously complementary. China offers investment in infrastructure objects which are necessary for further growth and development, and yet cannot be realized from internal financial and other resources. Given the fact these investments are usually placed in the form of loans, negative effects, such as high foreign debt to China, are also possible, and in smaller countries expected.

A general hypothesis is that Chinese FDI has different, and, in many aspects, more favourable effects than foreign direct investment in general. The indicators for this assumption are as follows:

1. Representing and applying the so-called *win-win* approach, which implies the mutual benefit of partners and a strategy that involves the realization of long-term interests in a particular country or region, China offers investment in infrastructure projects that are truly necessary for the host country, for which there are no internal financial and other resources;

2. An analysis of the origin of investments and sectors in Serbia and transitional economies [2] indicates the dominance of multinational companies from Western Europe and the placement of investments in sectors whose products and services are intended for the domestic market, internationally non-tradable and do not contribute to the improvement of the export results of the economy of the host country. These are trade chains, telecommunications, banks and other financial agencies and the real estate market. Investments in these sectors allow beneficiaries primarily to investors by conquering a part of the host country market. What is particularly important is that host countries have internal resources for the successful performance of these activities.

The aim of this research is to assess the effects of Chinese investments in infrastructure projects on the

key development indicators of the economy of Serbia. Since the first Chinese investment projects in Serbia started in 2010, the time distance is sufficient to assess the effects on a number of economic parameters.

The first part of the research relates to theoretical knowledge of the impact of infrastructure investment, and the impact of FDI (positive and negative) on the economic growth and development of the host countries. The following is a detailed description of research methodology, selected variables, data sources and description of quantitative methods. The key part of the paper is a quantitative analysis and comparison of the effects of Chinese and total foreign investments in Serbia.

II. THEORETICAL BACKGROUND

A. The impact of infrastructure investment on economic development

Infrastructure is widely recognized as a key precondition for the economic success of countries. The volume, state and efficiency of an infrastructure strongly influence the production and distribution of goods and services, as well as the living conditions of population, i.e., the labour force. The need for a developed and efficient infrastructure is indisputable. The main problem in this area is the optimal amount of investment in infrastructure, which depends on country's ability to provide necessary resources from its own or external sources.

An important mechanism of the influence of infrastructure on development is generating production increase through market expansion. Transport infrastructure has affected the increase in the commodity market by lowering transport costs and accelerating the delivery of perishable products. Market increase leads to the strengthening of competition, specialization, productivity growth and increase in the volume of production. The modern advancement of telecommunication infrastructure has caused the expansion of the concept of infrastructure and intensified the process of market expansion. Besides, infrastructure and its services are used not only by enterprises but also by households. Even the benefits that households gain from improved infrastructure have a positive impact on development, through lowering costs, increasing the quality of workforce and productivity [3].

The World Economic Forum in its report for 2018 points out that investing in infrastructure is “the key and the most efficient policy, which can respond to the tremendous challenge of growing unemployment in the world“ [4]. Infrastructure investments have been shown to sustain real income growth among the lower-skilled and foster employment and re-qualification in deindustrialized areas.

The assessment of the competitiveness of the economy shows that the countries with the most developed infrastructure have a far greater global competitiveness index (GCI) than those with poorly developed infrastructure [4].

Romer considers infrastructure as a basic assumption of business [5]. If countries do not have enough financial resources for building or necessary modernization of infrastructure, which usually involves very high investments, it is necessary to provide foreign direct investment [5].

B. The impact of FDI on economic development

The attractiveness of the idea of the exceptional impact of FDI on the development of the host countries comes from several theoretical assumptions. Some of them are: new enterprises increase the total volume of production, and new businesses or the expansion of existing activities generate jobs, thus reducing unemployment. The effects can also be manifested by increasing quality, not just quantity of production: multinational companies (MNC) transfer new technologies and knowledge into their branches in a host country [6]. MNC apply better organizational or management practices, improve the ability of companies to absorb more technology [7], they use better quality inputs, the branches gain access to foreign export markets, by providing them access to the entire business group [2]. These mechanisms should contribute to raising production to a higher level in qualitative and/or quantitative terms, stimulate economic growth and trade, reduce unemployment, indirectly this would further lead to the improvement of the macroeconomic environment, labour efficiency and increasing competitiveness in the global market.

This theoretical assumption gave rise to hundreds of papers analyzing the impact of FDI on economic growth. However, despite theoretically positive assumptions, most studies in quantitative terms do not result in a significant positive correlation between FDI and economic growth, although statistical methods are different (simple correlation or multiple regression, in combination with time series or panel data, and others).

Most empirical studies show a minimal positive or negative impact (absence of effects) of FDI *inflows* on economic growth [8, 9, 10, 11]. In some of these researches, the effects were markedly negative when the impact of FDI *stock* was analyzed, as the effects of long-term FDI concentration [8, 9].

Significant positive effects of FDI on economic growth are recorded in the analysis of the effects of FDI in the Central European countries [12, 13].

Some studies have suggested negative effects of FDI on economic growth, especially several empirical studies of post-socialist states [2, 14, 15].

Some possible reasons for the negative effects of FDI are the outflow of the entire profit from the host country. Transition economies experience negative impacts of FDI usually due to conducting privatization [2, 11, 12]. Privatization in these countries, in order to increase efficiency, has led to a reduction in the number of jobs (mass dismissal) and a reduction in salaries. Some analysts point out the problem of predominant placement of FDI in non-productive, thus

non-tradable sectors, such as banks, insurance, auditing and other financial agencies, as well as trade and telecommunications [2, 15]. Bearing in mind the opposite results of the former studies, we conclude that FDI is neither an incentive factor, nor a negative phenomenon a priori, but should be explored in a specific context, by applying the case study method.

III. THE INTEREST OF CHINA AND SERBIA WITHIN THE NEW SILK ROAD PROJECT

The renewed Silk Road proved as an efficient means of keeping a relatively high growth of the Chinese economy. It provides a new dimension to the same mechanism which has already raised it – investments and exports [16]. International infrastructure projects are becoming a new driver of Chinese economic growth and expansion, as the exports were in the previous phase. Some of the benefits that China gains within this project are engagement of its over-sized construction industry, increased exports of construction materials and machines, employment of skilled labor in this sector (engineers, architectures), interest revenue (investments have a form of loans), security of energy supply, and internationalization of yuan (RMB). The new land routes, with new arrangements with the countries to which routes lead, will enable China to conquer new export markets and maintain or expand the existing ones [16]. Chinese investment in infrastructure become 2010, three years before the formal start of so-called Belt and Road Initiative. They include many countries of post-Soviet space, Central and South Asia and several Middle Eastern countries. The next key points of the Chinese penetration into Central and then Western Europe is the railroad from the port of Piraeus in Greece, via Macedonia and Serbia to Budapest. Like in other regions, the New Silk Road is not limited to one project, but also includes the construction of bridges, highways, hydroelectric power plants, not just in countries along the Piraeus-Budapest railroad but also in other countries of Southeast Europe (Montenegro, Albania).

This is of great importance for the entire region. The Balkans, Southern and Eastern Europe, according to the World Economic Forum, are exemplars of the negative effects of poor infrastructure [4]. Among the many indicators that the World Economic Forum assesses the competitiveness of the economy, infrastructure is the indicator with the strongest impact on lowering the overall competitiveness index (GCI) of these countries.

The position of Serbia on the border of the European Union has great importance to China. This is evidenced by the fact that Serbia is the recipient of the largest Chinese investments in Southeast Europe of $ 10.26 billion 2019, even bigger than Greece, the entry point of this trace of the New Silk Road [17]. The largest investors are *Sinomach*, with a total investment of around $ 2.8 billion, with construction projects for energy plants, *China Communications Construction*, with investments of nearly $ 2 billion, *China Railway Engineering*, which invested $ 350 million in construction railways, *Shanghai Electric* - construction of electric and telecommunication lines, etc. Chinese investments in Serbia are not focused solely on infrastructure, but infrastructure investments are a key feature of the Chinese presence.

IV. RESEARCH METHODOLOGY

A. Methodological framework

As one of the research objectives is the comparison of the effects of total FDI and Chinese FDI within the New Silk Road, it requires a quantitative analysis to be done for both of them. The effects of investments (total and Chinese) are split into several variables. The impact on total GDP, i.e. economic growth, which is a common analytical setting, is considered, but also the impact of FDI on a series of separate indicators of growth and development is explored. The goal is to monitor in which manners the investments affect the economy.

Independent variables are a total foreign direct investment in Serbia and FDI originating from China [4, 17]. The dependent variables, on which FDI has hypothetical impact, are GDP, GDP per capita, unemployment rate, employment rate, foreign debt, imports of goods and services and exports of goods and services, as well as trade openness [18, 19].

The period involved in the analysis is maximum in terms of the inflow of Chinese direct investment - the period 2010-2018.

B. Statistical methods

Since there are several dependent variables involved in the correlation, we will use the Multiple Variable Analysis. The Multiple Variable Analysis procedure is designed to summarize two or more columns of numeric data. It calculates correlation and covariance between all the variables with each other [20]. So, it is easy to see all the relationships that mediate or are the result of the main correlation. Correlation coefficients measure the strength of the linear relationship between two columns on a scale from –1 to +1. The larger the absolute value of the correlation, the stronger the linear relationship between the two variables.

Basically, the Multiple Variable Analysis is a multiplied coefficient of correlation, which relies on the method of ordinary smallest squares (OLS). The method includes also P-value, which tests the statistical significance of the estimated correlations. P-values below 0.05 indicate statistically significant non-zero correlations at the 95.0% confidence level. In the studies of FDI impact on the economy, the application of multiple regression is relatively common, which also includes several variables, but it is not adequate for this purpose. Multiple regression implies a larger number of an independent and one dependent variable, while our research has a focus on reverse relations.

When it comes to a small number of observations, which is the case in this research, as the result of a

short period of inflow of Chinese FDIs into Serbia, the P-value has a tendency of relatively high values; it shows less statistical significance than the real one. Therefore, the model was additionally tested with Fischer's test (F-test) of statistical reliability, which is commonly used in small samples. The F-test estimates the difference between the variation of the two samples and it is directed to the general tendency of the set, rather than the matching between the pairs in the time series. It is considered that the result of the correlation can not be the result of coincidence when the F-value is greater than the F critical value.

V. RESEARCH FINDINGS AND DISCUSSION

The results of applying the Multiple Variable Analysis to the selected indicators of Serbian economy are given in the tables I and II.

TABLE I. EFFECTS OF TOTAL FDI ON THE SERBIAN ECONOMY

	Correlation coefficient	P-values	F-values	F-critical values one-tailed
GDP	**0.319**	0.312	39.377	3.787
GDP per capita	**0.365**	0.244	0.719	0.264
Unemployment	**-0.482**	0.226	3.82E	0.264
Employment	**0.651**	0.057 [a]	1.31E	0.291
Foreign debt	**-0.242**	0.563	1.36E	0.264
Export of goods	**0.676**	0.059 [a]	16.753	3.787
Import of goods	**0.594**	0.101	8.306	3.787
Export of services	**0.550**	0.039 [a]	0.884	0.291
Import of services	**0.274**	0.209	0.457	0.291
Trade openness	**0.686**	0.041 [a]	4724.9	3.438

[a] High statistical significance

TABLE II. EFFECTS OF CHINESE FDI ON THE SERBIAN ECONOMY

	Correlation coefficients	P-values	F-values	F-critical values one-tailed
GDP	**0.412**	0.108 [a]	7.282	5.050
GDP per capita	**0.445**	0.077 [a]	0.192	0.148
Unemployment	**-0.793**	0.051 [a]	1.171	0.198
Employment	**0.669**	0.146	4.740	0.198
Foreign debt	**-0.236**	0.652	4.750	0.198
Export of goods	**0.768**	0.074 [a]	5.195	5.050
Import of goods	**0.892**	0.017 [a]	3.979	3.450
Export of services	**0.687**	0.131	0.428	0.198
Import of services	**0.738**	0.094 [a]	0.306	0.198
Trade openness	**0.646**	0.1656	9121.7	6.833

[a] High statistical significance

The results of the analysis show that foreign direct investments generally have a positive impact on most indicators of the Serbian economy, regardless of origin. The effects of investing Chinese companies are significantly more favourable than the impact of total FDI, which confirms the initial hypothesis.

The statistical significance of the data obtained for the overall FDI is somewhat lower than in the analysis of the effects of Chinese investments. Due to the low number of observations, it is reasonable to reduce the acceptable level of confidence to 90% (P-value $\leqslant$ 0.10) instead of the most commonly accepted 95%. With statistical confidence of over 90%, we can determine strong positive total, as well as Chinese FDIs on 6 out of 10 indicators. The Fisher test, on the other hand, indicates the justification of rejecting the zero hypotheses in all 10 correlations with 95% reliability.

The positive impact of Chinese FDI on Serbia's economic growth is greater than the impact of overall FDI. Correlation with GDP is 0.31 and 0.41, with GDP per capita 0.36 and 0.44.

The positive and very strong impact of Chinese FDI is a negative correlation with the unemployment rate - 0.79. Such a positive correlation indicates a direct impact, that is, the engagement of the workforce by Chinese companies, but also the indirect impact on the increase in the number of jobs, through positive effects on the entire economy. Total FDI has a significantly smaller but still positive impact on the reduction of unemployment (-0.48).

The positive correlation with the employment rate and trade openness is almost identical in the case of Chinese and total FDI.

The positive and very strong impact of exports of goods also has Chinese (0.77) and total FDI (0.67). This can not be considered as the general effects of the New Silk Road projects, usually based on intensive investment in infrastructure projects in the host country, which have no direct impact on the export of the domestic economy. Chinese companies are interested in producing outside their own territory, but this applies to countries with cheaper labour, mainly in South and South-East Asia. In Southeast European countries, Chinese capital may eventually be invested in the production of inputs for construction projects, such as, for example, iron in Smederevo. In particular, in 2017 and 2018, the largest Serbian exporters were Zelezara Smederevo owned by the Chinese company HBIS Group, the Italian Fiat and the Serbian Oil Company of Russia owned by Russian Gazprom.

The strongest impact was on the growth of imports of goods and services. This is generally expected to be the result of investments by Chinese companies, whether it is a manufacturing or construction sector. This can be a direct consequence of the increase in imports of goods and services from China for the needs of the implementation of the infrastructure project, and in this case, it is a short-term impact. This is not the case in Serbia. The strong correlation of

foreign investments with imports is not a consequence of the growth of imports from investor countries. The analysis of Serbia's imports showed that in the observed period there was no increase in imports from China. Import growth can be the result of a generally positive impact on the state of the economy and the growth of purchasing power.

VI. CONCLUSIONS AND RECOMMENDATIONS

The results of the survey show the correctness of the general hypothesis that the Chinese FDI within the New Silk Road, have a more positive impact on the economy of Serbia than FDI originating in other countries. This is the result of the focus of Chinese investors on infrastructure projects and parts manufacturing, which give the most powerful positive effects than telecommunications, finance and trade, as the most important destinations of European investments.

The overall impact of Chinese FDI has been strongly correlated with the most important economic indicators, with a high degree of statistical reliability. The total FDI in Serbia also had a significant positive impact on the Serbian economy, with an intensity lower by an average of about 30% from the impact of Chinese investments.

The strong influence of Chinese investments did not lack in any of the selected indicators of the Serbian economy, except that the assumption about the impact on external debt was rejected, due to the poor statistical reliability of the obtained results.

Countries involved in this global Chinese project can expect significant economic growth, based on:

- increased production, especially in the construction sector, which is already known as a strong economic stimulus,
- reducing unemployment (and increasing employment rates), which can be an additional driver, not only growth but the overall development of the economy,
- positive effects on exports of goods,
- increasing the degree of openness of the economy, which is considered a basic prerequisite for modern economic development.

The results of the research may be significant for other countries of South-East Europe, which have shown interest in joining the project: Macedonia, Montenegro, Bosnia and Herzegovina. These countries have a similar economic structure, resources, trade and investment partners, and the position on the Silk Road routes, but Chinese investments are still too small to quantify its effects.

These countries generally can rely on results related to Serbia, with a warning that China's FDI, usually in the form of a loan, has a significant risk of over-indebtedness. Large infrastructure projects often require enormous financial resources, and small economies, such as Montenegrin and Macedonian, are in danger of being unable to repay their debts.

This potentially negative effect is not an insurmountable obstacle for building necessary infrastructure facilities, nor for inclusion in the Chinese infrastructure projects. Besides carefully planning of a loan arrangement, a recommendation is to favour concessions instead of loans in cases of projects that are disproportionately large in comparison with the size of a domestic economy, which is in the interest of both sides.

REFERENCES

[1] National Development and Reform Commission, Ministry of Foreign Affairs, and Ministry of Commerce of the People's Republic of China *Vision and Actions on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road,* 2015, Retrieved from http://en.ndrc.gov.cn/newsrelease/ 201503/t20150330_669367.html, 29.12.2018.

[2] N. Stanojevic and S. Kotlica, "The Features and Effects of Foreign Direct Investment in the Transition Economies," in *Zbornik matice srpske za društvene nauke*, ISSN 0352-5732, No. 152, 2015, pp 543-555.

[3] R. Prud'homme, "Infrastructure and Development," Paper prepared for the ABCDE (Annual Bank Conference on Development Economics), Washington, May 3-5, 2004.

[4] World Economic Forum, WEF *The Global Competitiveness Report 2018,* Retrieved from www.weforum.org/reports/the-global-competitveness-report-2018, 29.12.2018.

[5] P. M. Romer, "Idea gaps and object gaps in economic development", *Journal of Monetary Economics, 32*(3), 1993, pp. 543-573. Retrieved from https://econ171ucb.files.wordpress.com/2011/06/romer_ideas gap.pdf , 18.01.2019.

[6] P. M. Romer, "Endogenous Technological Change", *Journal of Political Economy* 98, 1990, pp. S71-S102.

[7] G. Grossman and E. Helpman, Innovation and Growth in the Global Economy. MIT Press, MA, 1991.

[8] J. Kentor and T. Boswell, "Foreign Capital Dependence and Development: A New Direction," *American Sociological Review* 68:301–13, 2003.

[9] G. Firebaugh, "Growth Effects of Foreign and Domestic Investment," *American Journal of Sociology*, 98(1): 105–30, 1992.

[10] A. Navee, and G. Shabbir, "Trade Openness, FDI and Economic Growth: a Panel Study," *Pakistan Economic and Social Review,* Vol. 44, No. 1, 2006, pp. 137-154.

[11] S. Estrin and M. Uvalić, "Foreign direct investment into transition economies: Are the Balkans different?" *LEQS Paper* 64, 2013.

[12] P. Hofmann, The Impact of International Trade and FDI on Economic Growth and Technological Change. Springer Verlag, Berlin Heidelberg, 2013.

[13] P. Hlavacek and B. Bal-Domanska, "Impact of Foreign Direct Investment on Economic Growth in Central and Eastern European Countries," *Inzinerine Ekonomika-Engineering Economics,* 27(3), 2016, pp. 294–303. Retrieved from https://www.researchgate.net/publication/304575572_Impact of_Foreign_Direct_Investment_on_Economic_Growth_in_Ce ntral_European_Countries (15.01.2019).

[14] N. Bandelj and M. Mahutga, "How Socio-Economic Change Shapes Income Inequality in Central and Eastern Europe," *Social Forces*, 88(5), 2010, pp. 2133–2161.

[15] K. Curwin and M. Mahutga, "Foreign Direct Investment and Economic Growth: New Evidence from Post-Socialist Transition Countries," *Social Forces*, vol. 92/3, 2013.

[16] N. Stanojević, "The New Silk Road and Russian Interests in Central Asia," *The Review of International Affairs*, January-March 2016, pp. 142-161.

[17] The American Enterprise Institute and the Heritage Foundation, *China World Investment Tracker*, Retrieved from www.aei.org/china-global-investment-tracker, (11.12.2018).

[18] World Banka database - https://data.worldbank.org/indicator (15.01.2019).

[19] UN Comtrade https://comtrade.un.org/data/ (11.01.2019).

[20] G. Carey, Multivariate Analysis of Variance (MANOVA): I. Theory. Academic Press, Boston, 1998. Retrieved from http://ibgwww.colorado.edu/~carey/p7291dir/handouts/manova1.pdf (11.01.2019).