

Assessment of the International Cross-Countries Investment Flows: Empirical Evidence from Russia and China

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Abstract—The present paper differentiates the bilateral investment flows into the cross-countries FDI flows and the mutual bilateral FDI flows. The latter presumes deep and significant investment linkages between the pair of countries. The study introduces the indicators and criteria of the mutual bilateral FDI flows which provides detailed picture of the bilateral investment relationship. The results suggest that the bilateral Russian-Chinese FDI flows were not mutual for the period 2014-2019. The study reveals the inadequacy of official bilateral FDI flows statistics and advocates the usage of ultimate recipient country FDI statistics for the examination of the bilateral investment relationship. That together with the usage of introduced indicators of the mutual FDI flows will provide a more accurate and precise snapshot of the bilateral investment relationship of any pair of countries. The introduced indicators provide the tool for such evaluations but dependent FDI flows ultimate investor data are required for the additional insights into the investment cooperation policymaking.

Keywords— *foreign direct investment (FDI), mutual FDI, bilateral FDI flows, FDI statistics, Russia, China*

I. INTRODUCTION

A. Introduction

The object of the present paper is to examine the cross-countries Russian-Chinese FDI (foreign direct investment) flows and to reveal whether they are mutual. For that purpose, the study introduces the criteria of the mutual bilateral FDI flows.

The advantage of using these criteria is fourfold. First, the analyses of cross-countries relationship in absolute values will reveal the size of bilateral FDI flows. Second, the usage of these criteria will identify the intensity of the investment relationship between two countries, indicate whether they are willing to invest into each other's economy instead of investing into the third countries. Third, the criteria will allow to assess whether the countries are important to each other as the investment partners. Fourth, they will reveal the tendency of investment relationship development.

We separate external and internal investment attractiveness of the country. By external investment

attractiveness we mean the attractiveness of the country as the destination of FDI to the foreign investors. I.e. investment environment in the host country is so favorable that the foreign investors choose this country as the destination of their FDI. By internal investment attractiveness of the country we mean the attractiveness of the domestic investment projects to the internal investors. The higher is the internal investment attractiveness of the country, the less is the possibility of the FDI outflow. And in turn, the higher is the external investment attractiveness of the country, the larger is the FDI inflow to the country. For that reason, each country is interested in the enhancement of both internal and external investment attractiveness.

Contemporary Russian researches [21, 26, 29, 30] use the definitions “cross-countries” bilateral investment and “mutual” bilateral investment as synonyms. In our previous research [23] we suggested using these two definitions as separate ones. In particular, by cross-countries investment we understand such oppositely directed bilateral FDI flows when each of two partner countries is simultaneously a home and a host country. By mutual international investment, namely mutual FDI, we understand such bilateral FDI flows which are sufficiently large and intensive and which indicate deep investment cooperation between two countries in question. The final goal of effective investment cooperation between two countries is the transformation of any cross-countries investment into mutual FDI flows.

FDI outflow can have a positive and a negative effect upon the home country's economy. The capital flight through offshores has a negative effect. By the positive effect of FDI outflow we mean export of capital in such spheres as metal manufacture, electric utility industry, telecommunications etc. which allows the producers to conquer the new foreign markets, to get the access to resources. Hence such FDI outflow will influence positively the economic development of the home country. Nevertheless, significant FDI outflow can influence negatively the economic development of the country in case when the internal investment isn't sufficient. If that is the case the measures should be taken to enhance internal investment attractiveness of the country.

Cross-countries bilateral investment analysis requires examining of both external and internal investment attractiveness of the host country. In case of high values of these two indicators the country will have advantages in bilateral investment processes as it will attract significant FDI inflows from the home country while FDI outflows won't be significant. At the same time this situation will characterize cross-countries bilateral FDI flows, not mutual bilateral FDI flows. Such discriminating investment relationship indicate the lack of the deep investment cooperation between two countries each of which doesn't consider this relationship significant and important.

B. Theoretical Background and Empirical Studies

Notwithstanding the abundance of literature on bilateral FDI they focus mainly on several major directions: the linkages between FDI and foreign trade [19, 27, 31]; the effects of bilateral investment treaties on country's FDI [12; 14]; the factors which determine FDI inflows into host country [1, 9, 11, 13, 18]; the determinants of FDI outflows [7]; FDI data problems [2, 5, 6, 9, 10, 16].

Although many researchers analyze bilateral FDI flows they examine FDI data upon vast number of countries. E.g., Xiong and Sun (2019) examined export and FDI relationship with over 140 countries from 2001 to 2006 and argued that export and FDI were complementary with FDI flows promoting export especially in case of developed-developing country pairs. Other researchers [19, 27] examined the influence of inward and outward direct investment flows from/to various trade partners on the certain country's - Malaysia's [27] or Canada's [19] - bilateral export trade. Both studies indicated that inward and outward FDI flows were complementary to bilateral export trade although in certain cases export might have been harmed by FDI outflows [19].

Likewise, Jung and Kim (2020) estimated the impact of concluding bilateral investment treaties (BITs) on FDI outflows from particular country (South Korea) into all the treaty partners for the period 2001-2012. South Korea-developing countries pairs demonstrated significant effect of BITs upon South Korea FDI outflows while the effect on South Korea-developed countries groups wasn't statistically significant [12].

Kox and Rojas-Romagosa (2020) analyzed FDI data for over 200 countries for the years 2001-2012 and revealed that preferential trade agreements (PTAs) and BITs had a positive and significant effect on FDI inflows and inward stocks. Also they raised an important issue of FDI data problem [14]: "Most data sources on FDI only provide inflows or outflows of one country from/to the rest of the world". Up till 2015 there existed UNCTAD's Bilateral FDI Statistics which provided the information for over 200 countries for the years 2001-2012 for FDI inflows, outflows, instock and outstock. Since 2013 bilateral FDI data on country-country base is lacking. And that, as Fertó and Sass (2020) stressed, hindered empirical research on many aspects of FDI. Also Fertó and Sass (2020) advocated that new data on FDI stocks broken down according to the nationality of the ultimate owner company were preferable for the examining of the determinants of bilateral FDI. Main disadvantage of these data is their availability for the limited number of countries.

Damgaard & Elkjaer (2017) and Damgaard et al. (2019) revealed incoherence between FDI inflow and outflow data

in traditional bilateral statistics of any pair of countries which they explained as existing due to effect of moving from the intermediary countries (often tax havens or offshore financial centers) to the ultimate host country. The studies presumed that the elimination of such phantom FDI flows from bilateral FDI statistics might decrease the volumes of global ultimate bilateral FDI flows by 30-40 percent. The calculations based on the data of OECD countries suggested also that round-tripping with the country providing ultimate FDI to itself accounted on average for 5 percent of FDI. The study of Damgaard & Elkjaer (2017) provided the analytical tool for the assessment of the phantom FDI flows and for the estimation of the real bilateral FDI linkages based on the home country-ultimate host country relationship. While the calculations of Damgaard & Elkjaer (2017) were based on the extrapolation of the distribution of the bilateral FDI and of ultimate investors of the twelve OECD countries to all countries of the world, Casella (2019) who also advocated the inadequacy of official bilateral FDI statistics suggested to examine the distribution of ultimate recipient countries in bilateral FDI stock with the help of the absorbing Markov chain.

A bulk of articles is devoted to the determinants of FDI inflows. The findings indicate that the main determinants of FDI inflows are: distance, relative country size and trade costs – for the Czech Republic, Hungary and Poland [9]; the market size of host and home countries, distance, common language, common border, inflation rate, real interest rate, telecommunication, degree of openness, index of globalization and index of economic freedom of host countries - for China, South Korea, India and Singapore [18]; market size, trade openness, preferential trade agreements and financial development - for 16 Arab economies [1]; economic stability, market size, currency value, size and depth of capital market - for BRICS countries [13]; market size, distance, common language, a political risk index and a financial openness index in the host country, free trade agreements between host and home countries, corporate tax etc. - for Asian economies [11].

Dreger et al. (2017) examined the factors for Chinese FDI outflows in the European Union. The study finds that market size and bilateral trade are the main determinants of Chinese investment in the EU.

According to Zhang (2005) a bilateral FDI relationship is characterized by FDI size and FDI intensity. The study indicated that political relations, distance, the overseas Chinese, political system, bilateral trade relations (export intensity indexes, BITs) were catalyst of the intensity of FDI inflows into China. She found the variables such as market size, bilateral trade relations (export and import values), trade barriers, the overseas Chinese, distance, developmental level and dissimilarity as the determinants of the size of FDI inflows into China from 45 countries during the period 1996-1999.

Li et al. (2018) used bilateral FDI flows data between 206 countries from 2003 to 2012 to construct the global FDI flows network for each of 10 years and to delineate the FDI flows features and dynamics. In their research they used such network measures as flow volumes and connections.

Among the researchers who use the case of China for examining bilateral FDI flows we can name: Dreger et al. (2017) – FDI outflows from China; Zhang (2005) – FDI

inflows in China and FDI intensity index; Mishra and Jena (2019), Kishor and Singh (2015), Hattari and Rajan (2008) – FDI inflows in certain countries including China; Sizykh (2019a) – FDI outflows from China to Russia and their determinants; Sizykh (2019b) – the dynamics and tendencies of FDI outflows from China.

According to Sizykh (2019a) the Chinese FDI outflows into Russian Federation are determined by: market size, bilateral trade relations and the global competitiveness of Russia.

Petri (1994), Dunning (1997), Zhang (2005), Li et al. (2018), Damgaard & Elkjaer (2017), Damgaard et al. (2019), Casella (2019) provided empirical tools for measuring bilateral FDI relations.

While many empirical studies have been conducted on the determinants of FDI inflows and outflows (including bilateral FDI), the linkage between bilateral FDI and bilateral trade, the influence of BIT's on FDI inflows, to our knowledge there is no empirical research (except for our previous study [23] on Chinese-Russian cross-countries bilateral FDI flows with the emphasis on determination of their mutual nature.

In this regard, this paper empirically examines whether Chinese-Russian cross-countries FDI flows are mutual. For that reason, we construct four indicators of the mutual bilateral FDI flows and criteria which allow to reveal whether cross-countries bilateral FDI flows are mutual and to indicate the particular type of bilateral FDI flows.

II. METHODOLOGY

A. Data Sources

The data used for the estimations involve two economies – China and Russia.

All the data used in this study are publicly published ones.

The paper examines Chinese-Russian cross-countries bilateral FDI flows over the period from 2014 to 2019. The FDI data are based on the Central Bank of Russia (Direct investments in the Russian Federation: Flows by instruments and Partner Country; Direct investments of the Russian Federation Abroad: Flows by instruments and Partner Country), National Statistical Bureau of China (China Statistical Yearbook) and UNCTAD (World Investment Report) publications and the World Bank database in millions of US dollars. file.

B. Measurements

This study introduces four indicators (Fig. 1) to examine the mutual character of cross-countries FDI flows.

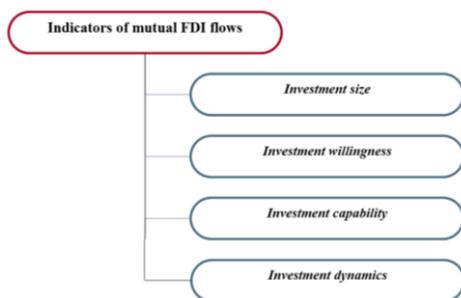


Fig. 1. Indicators of the mutual bilateral FDI flows

These indicators are the following:

1. *Investment Size (IS)* that is evaluated as the absolute value of FDI flow from the home country *i* to the host country *j* (1):

$$IS_{ij} = FDI_{ij} \quad (1)$$

where *IS_{ij}* is the size of investment from home country *i* into host country *j*;

FDI_{ij} is FDI flow from home country *i* into host country *j*.

2. *Investment Willingness (IW)* that is evaluated as intensity (gravity) index of investment relationship [8, 22] or FDI intensity index [32] and is calculated as the ratio of the share of host country *j* of the total FDI outflow from the home country *i* to the share of host country *j* of total world FDI outflow with the exception of home country *i* (2):

$$IW_{ij} = \frac{FDI_{ij}/FDI_{iw}}{FDI_{wj}/(FDI_w - FDI_{wi})} \quad (2)$$

where *IW_{ij}* is the willingness of the home country *i* to invest into the host country *j*;

FDI_{iw} is total FDI outflow from the home country *i*;

FDI_{wj} is total FDI inflow into the host country *j*;

FDI_{wi} is total FDI inflow into the country *i*; *FDI_w* is total world FDI outflow.

Investment willingness indicates whether the home country *i* is more or less eager to invest in the host country *j* in comparison with investing into the other host countries.

3. *Investment Capability (IC)* that is evaluated as the share of the home country *i* in total FDI inflow into the host country *j* (3):

$$IC_{ij} = \frac{FDI_{ij}}{FDI_{wj}} * 100\% \quad (3)$$

where *IC_{ij}* is the capability of home country *i* to invest into the host country *j*.

Investment capability indicates the relative importance of the home country *i* in the host country's *j* FDI inflows.

4. *Investment Dynamics (ID)* that is evaluated as the FDI growth rate (4):

$$ID_{ij} = \frac{FDI_{ijt} - FDI_{ijt-1}}{FDI_{ijt-1}} * 100\% \quad (4)$$

where *ID_{ij}* is the dynamics of the growth of FDI flow from the home country *i* into the host country *j*;

t represents time period.

Investment dynamics indicates the tendency in the bilateral investment cooperation development.

As annual FDI data may change substantially, the present paper uses six- and five-year average (depending on the availability of official statistics) for each of the four above-mentioned indicators to reveal the general tendencies in bilateral investment cooperation.

The criteria of the mutual bilateral FDI flows are presented in Table I.

TABLE I. THE CRITERIA OF THE MUTUAL BILATERAL FDI FLOWS

Indicators of the mutual bilateral FDI flows	Criteria of the mutual bilateral FDI flows
Investment Size	$IS_{ij} \geq 1$ mln. USD
Investment Willingness	$IW_{ij} \geq 1$
Investment Capability	$IC_{ij} \geq 1\%$
Investment Dynamics	$ID_{ij} \geq 0\%$

Based on the listed in Table I criteria the study differentiates several types of FDI flows of any pair of countries (Table II).

TABLE II. THE TYPES OF BILATERAL FDI FLOWS

The types of bilateral FDI flows	Criteria of the types of FDI flows
<i>cross-countries bilateral FDI flows:</i>	
insignificant and/or chaotic bilateral investment cooperation	$IS_{ij} \leq 0,1$ mln. USD $IW_{ij} < 0,1$ $IC_{ij} < 0,1\%$ $ID_{ij} < 0\%$ or $ID_{ij} \geq 0\%$
potentially mutual bilateral FDI flows	$0,1$ mln. USD $< IS_{ij} \leq 10$ mln. USD $0,1 \leq IW_{ij} < 1$ $0,1\% \leq IC_{ij} < 1\%$ $ID_{ij} \geq 0\%$
<i>mutual bilateral FDI flows:</i>	
mutual bilateral FDI flows with shrinking bilateral investment cooperation	$IS_{ij} \geq 1$ mln. USD $IW_{ij} \geq 1$ $IC_{ij} \geq 1\%$ $ID_{ij} < 0\%$
steady mutual bilateral FDI flows	1 mln. USD $< IS_{ij} \leq 10$ mln. USD $IW_{ij} \geq 1$ $IC_{ij} \geq 1\%$ $ID_{ij} \geq 0\%$
mutual bilateral FDI flows with enhancing bilateral investment cooperation	1 mln. USD $< IS_{ij} \leq 100$ mln. USD $IW_{ij} \geq 1$ $IC_{ij} \geq 1\%$ $ID_{ij} \geq 100\%$
mutual FDI flows of two partners for both of which their bilateral investment cooperation is very significant and prolific	$IS_{ij} > 100$ mln. USD $IW_{ij} \geq 2$ $IC_{ij} \geq 2\%$ $ID_{ij} \geq 0\%$

III. RESULTS AND DISCUSSIONS

The results of the estimations are presented in Tables III and IV.

TABLE III. CROSS-COUNTRIES FDI FLOWS INDICATORS: BILATERAL FDI FLOWS BETWEEN RUSSIA AND CHINA: 2014-2019 (DATA OF CENTRAL BANK OF RUSSIA)

Indicators of the mutual bilateral FDI flows	2014-2019 average
IS_{RFC} , mln. USD	30.46
IW_{RFC}	0.01
IC_{RFC} , per cent	0.02
ID_{RFC} , per cent	107.03
IS_{CRF} , mln. USD	420.73
IW_{CRF}	0.39
$ICCRF$, per cent	2.84

$IDCRF$, per cent	168.92
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^awhere RF, C – the Russian Federation and China respectively

^bdata of the Balance of Payments of the Russian Federation (FDI inflows minus FDI outflows)

Original Data Source: [3; 4; 20]

TABLE IV. CROSS-COUNTRIES FDI FLOWS INDICATORS: BILATERAL FDI FLOWS BETWEEN RUSSIA AND CHINA: 2014-2018 (DATA OF THE NATIONAL BUREAU OF STATISTICS OF CHINA)

Indicators	2014-2018 average
IS_{RFC} , mln. USD	41.61
IW_{RFC}	0.02
IC_{RFC} , per cent	0.03
ID_{RFC} , per cent	109.5
IS_{CRF} , mln. USD	1438.23
IW_{CRF}	0.99
IC_{CRF} , per cent	5.48
ID_{CRF} , per cent	44.28

Original Data Source: [3; 4; 20]

Tables III and IV show the difference between the indicators of cross-countries FDI flows from China to the Russian Federation and from the Russian Federation to China. First, the values of the indicator “investment size” for Russia and for China are very inconsistent - the inflow of Chinese FDI in the Russian economy surpasses the outflow of the Russian FDI to China up to 35 times according to the data of National Bureau of Statistics of China. That means that Russian economy possesses relatively higher investment attractiveness to Chinese investors than Chinese economy to the investors from Russia. Second, although the average value of the indicator “investment dynamics” is positive and relatively high (44.28%-168.92%) there is no definite tendency in the bilateral investment cooperation development as both flows decrease and increase in their values from year to year chaotically. These data stress the unstable character of bilateral Russian-Chinese investment relationship. Third, the values of the indicator “investment capability” emphasizes the relative importance of China in FDI inflows to the Russian Federation and very low capability of Russia to invest into China (the share of the Russian Federation in total inflows to China is less than 0.06% for the whole period 2014-2019). Nevertheless, the value of ICCRF is not as high as to make Russian economy dependent on the inflow of Chinese FDI. Forth, although the data of National Bureau of China reveal that Chinese investors are willing to invest into Russian economy, the value of IWRFC indicates that Russian investors are more eager to invest in other countries than in China.

The results of the estimations reveal that bilateral investment flows between China and the Russian Federation are not mutual. Although the values of the indicators “investment size” and “investment dynamics” for both countries meet criteria of the mutual bilateral FDI flows, the values of the other two indicators - “investment willingness” and “investment capability” – for Russia are not high enough to meet even the criteria of the potentially mutual bilateral FDI flows. For that reason, in spite of relatively high values of ICCRF and IWRFC bilateral FDI flows between the Russian Federation and China cannot be described as “mutual” but as “cross-countries ones with insignificant and chaotic bilateral investment cooperation”.

For deepening of this bilateral investment relationship the precise and full-range measures should be taken. But even the preparation of such list of measures require preliminary analysis of the current bilateral investment cooperation which in its turn requires precise and full data which make it possible to evaluate the level of bilateral investment relationship. That raises the important issue of the adequate bilateral FDI flows statistics. The present study (Tables III and IV) illustrates the incoherence of bilateral FDI flows data in different countries (in our case China and the Russian Federation). The only publication of the international organizations on the issue of bilateral investment flows is the report of UNCTAD “Bilateral FDI statistics 2014”. The up-to-date data provided by the international organizations (e.g. the World Bank, UNCTAD etc.) don’t contain consistent country-pairs information about the cross-countries bilateral investment flows. That’s why the analysis of bilateral FDI flows requires addressing to the national statistics of each of the analyzed countries.

One can find full cross-countries investment flows data in the balances of payments issued by national central banks. But balance of payment may not contain the detailed information upon FDI flows by industries and countries. For that reason, in Table III we had to use the data of the balance of payments of the Russian Federation which are based on asset/liability principle and in Table IV – the data of the National Bureau of statistics of China which are based on the absolute value of the FDI inflows and FDI outflows.

Although international organizations, such as UNCTAD, IMF and OECD try to standardize FDI statistics all their data concerning FDI volumes and dynamics are very rough. E.g. in case with Russia up till 2012 UNCTAD used FDI data provided by the Central Bank of the Russian Federation in spring while the final data were published in summer. The discrepancy with the final data which were used by e.g. the IMF was up to 15-20% [15].

Also according to UNCTAD (2019) there is significant discrepancy between bilateral FDI data held by direct investors (traditional FDI statistics) and by ultimate investors (new FDI statistics) which arouses due to the large share of tax havens in traditional bilateral FDI data. That makes contra productive the usage of traditional bilateral FDI statistics as is doesn’t reveal the real picture of cross-countries FDI relationship. Nevertheless, by 2017 only 13 developed countries prepared FDI data by ultimate investors [2].

The above-mentioned inadequacy of traditional bilateral FDI statistics effects negatively the examination of cross-countries investment relationship as in our case the calculated indicators of investment willingness and investment capability may be inaccurate due to the false data of total FDI inflows and outflows of China and the Russian Federation.

All above-mentioned problems of bilateral FDI flow data accuracy hinder the estimation of cross-countries bilateral FDI flows which in turn hinder the formulation of adequate policy implications for enhancing external and internal investment attractiveness of the country.

IV. CONCLUSIONS

The estimation of the FDI linkages allows to reveal the level of economic integration and cooperation between

countries. This study introduces the indicators and the criteria of the mutual character of the bilateral cross-countries FDI flows. The usage of these indicators allows to reveal whether the bilateral cross-countries investment relationship is significant, intensive and stable, i.e. mutual, or insignificant and/or chaotic, or discriminative (one-sided). This information can be the empirical basis for the bilateral investment cooperation policymaking.

The assessment of the mutual FDI flows indicators revealed that the bilateral investment cooperation of China and the Russian Federation for the period 2014-2019 wasn’t mutual but insignificant and chaotic.

At the same time, we must stress the inadequacy of the official bilateral FDI statistics which challenges the evaluation of cross-countries bilateral FDI flows. The availability and consequent usage in the calculations of the ultimate recipient countries instead of intermediaries in the bilateral FDI flows data might have shown different results as the values of the total FDI outflows of China and the Russian Federation would be different - without round-tripping – and as the values of bilateral FDI inflows to China and to the Russian Federation as to the ultimate recipient countries would be also different.

Hence the evaluation of the introduced indicators and criteria of the mutual character of the bilateral cross-countries FDI flows would be recommended to be conducted on the empirical evidence of the countries which provide or for which it is possible to calculate the ultimate recipient country FDI flow statistics. That will enhance the effectiveness of usage of the introduced tool of assessment of bilateral cross-countries FDI relationship and of determination of their mutual character.

National investment policies oriented on the enhancement of the external investment attractiveness of the country depend on the precise picture of current state of investment linkages between the given country and its partners. The introduced indicators provide the tool for such evaluations but dependent FDI flows ultimate investor data are required for the additional insights into the investment cooperation policymaking.

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