



ANALYSING THE IMPACT OF ADJUSTED NET SAVINGS ON TRANSNATIONAL INVESTMENT: A COMPARATIVE ANALYSIS OF THE USA AND THE PRC

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Abstract. *In the context of the simultaneous development of globalization and de-globalization processes of a turbulent environment that constantly catalyses changes in the directions and volumes of international investment by TNCs, there is a need to monitor the current state of international investment. Host countries and countries where corporations are based seek to improve their investment climate in order to effectively use their own and borrowed financial resources.*

The paper demonstrates, through a comparative analysis, a new methodological tool for identifying the value of the level of adjusted net savings (ANS) as a stimulating factor for increasing the inflow of transnational investment (FDI) to the recipient country. Using economic-mathematical modelling based on the author's approaches, the degree of influence of ANS on the volume of transnational FDI is revealed.

There is a large number of scientific and practical discussions about the key motives and factors that are of primary importance for the formation of net savings. Identification of the most important ones, in particular the volume of transnational investment, is relative and depends on the legal, cultural, and information environment of the country.

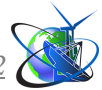
The purpose of this study *is to build models for determining the dependence of foreign direct investment on the adjusted net savings of the recipient country as an alternative approach to identifying an indicator that most broadly reveals the level of welfare of society and economic development of the countries under study.*

Study methods. *This paper uses both general scientific and special methods of scientific cognition: theoretical generalization, analysis and synthesis of the comparison of the scale of investment by transnational corporations; methods of statistical, economic, retrospective and comparative analysis; economic and mathematical modelling methods; correlation and regression method.*

Keywords: *adjusted net savings, competitiveness, econometric estimates, methodological tools.*

Introduction.

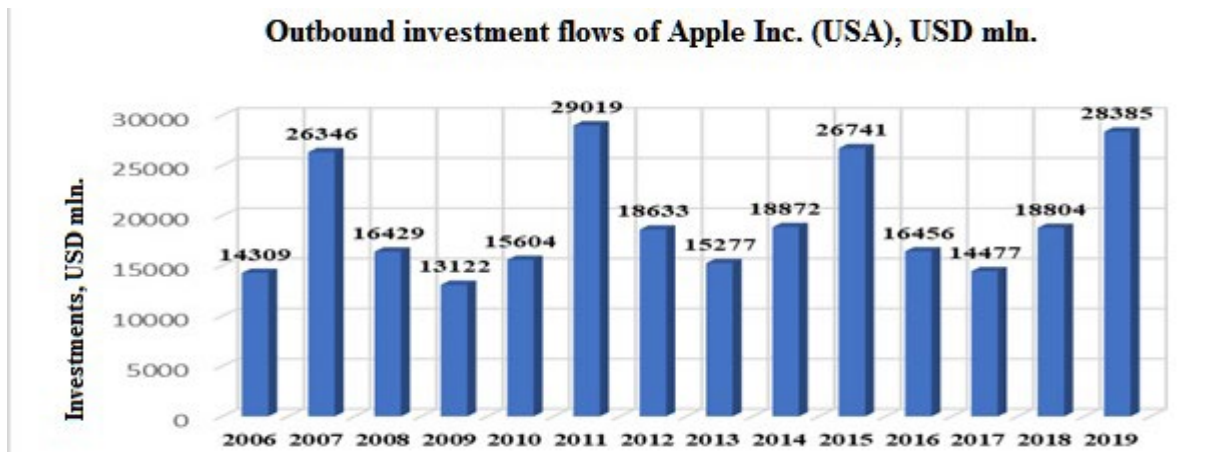
Each country has its own set of competitive advantages, due to which it seeks to position itself attractively in the global economic space. It should be emphasized that all countries are different in their economic development, and the reason for this is a combination of global, regional, sectoral and microeconomic factors that transform the activities of business entities and their investment activity. Hence, there is a need to identify both positive and negative factors of social development of society and its welfare, including investment processes of transnational corporations.



Analysis of scientific literature sources. The issues of modern trends and patterns of international investment processes are covered in the papers of such foreign scholars as I. Ansoff (1989), L. Gitman (2012), J. Dunning (2012), K. Cameron (2001), M. Casson (2014; 2017), G. Markowitz (2018), F. Ruth (2017), J. Stiglitz (2009), F. Fabozzi (2005), S. Hymer (2010), W. Sharp (1999), as well as well-known domestic researchers such as D. Lukianenko, O. Mozhovyi, T. Oriekhova, Ye. Panchenko, A. Peresada, O. Prymostka, O. Rohach, Ya. Stoliarchuk, O. Shvydanenko and others.

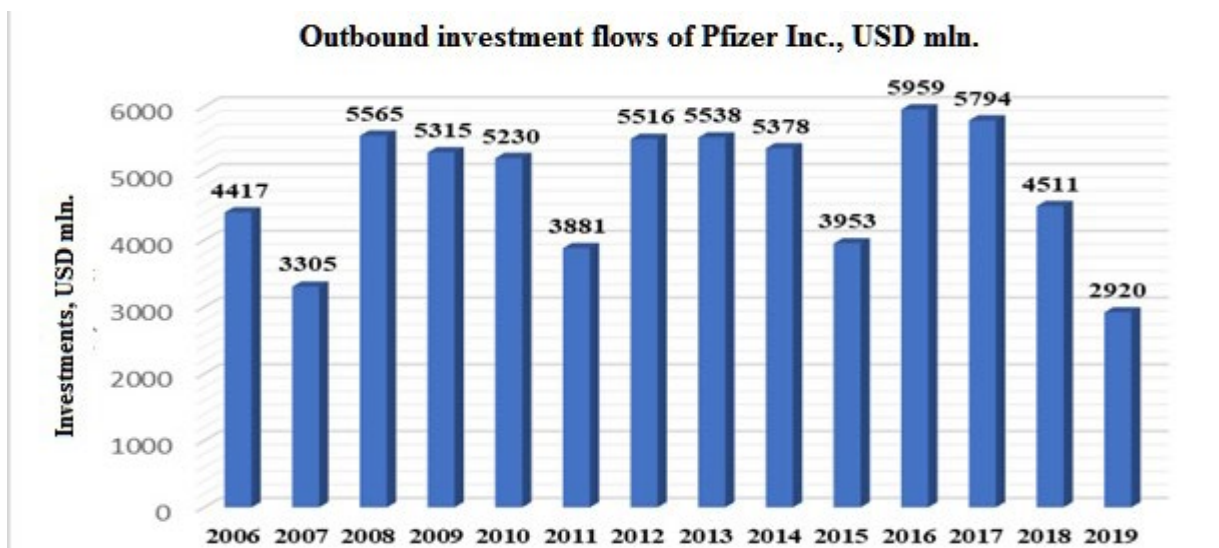
Despite the significant results of previous studies, a critical assessment of current investment trends, the need to identify the dominant macroeconomic indicator of the investment attractiveness of the recipient country argue for the need to find new methodological tools to identify the role of adjusted net savings in stimulating an increase in the inflow of transnational capital to the recipient country.

Study results. At this stage of the analysis, we will determine the degree of dependence of transnational investment on the size of the adjusted net savings of recipient countries [1, 2]. The choice of corporations was based on the recent development of investment activity of these TNCs and their aggressive investment behaviour when entering foreign markets, which is selectively presented in (figure 1).



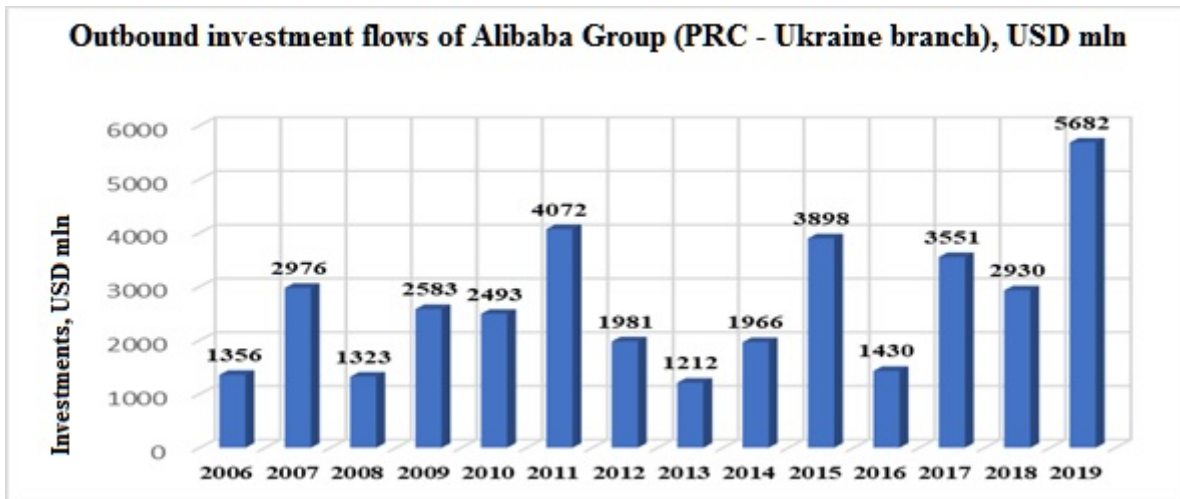
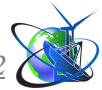
A) Outbound investment flows of Apple Inc. (USA) for 2006-2019.

Source: own calculations based on <https://www.apple.com/>

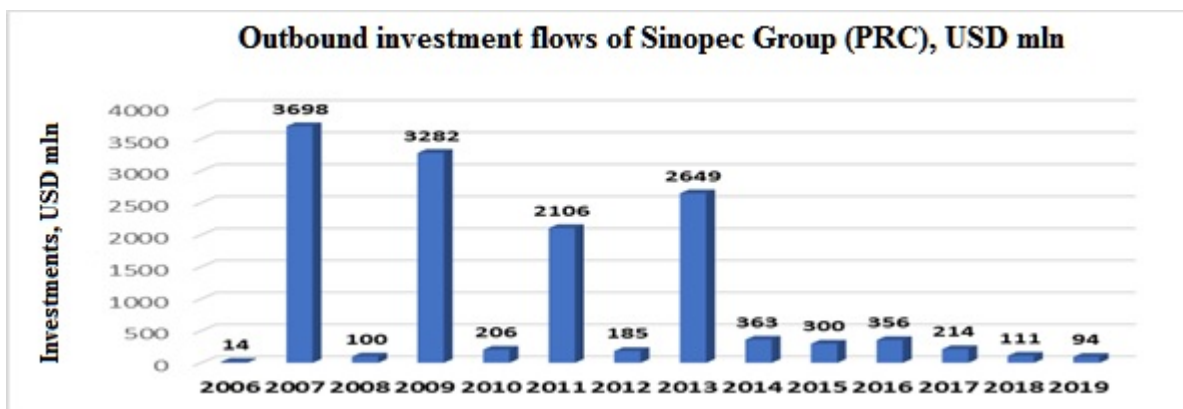


B) Outbound investment flows of Pfizer Inc. (USA) for 2006-2019.

Source: own calculations based on <https://www.pfizer.com/>



C) Outbound investment flows of Alibaba Group (PRC - Ukraine branch) for 2006-2019.
 Source: own calculations based on <https://www.alibabagroup.com/en/global/me>



D) Outbound investment flows of Sinopec Group (PRC) for 2006-2019.
 Source: own calculations based on [7]

Figure.1. - “Volumes of transnational investment flows to the USA and the PRC” [3]

Using the statistical data of the World Investment Report (2018), we will form an initial information base, presenting it in tabular form (Table 1), and then build a functional linear dependence.

Based on the data in (table 1), the analysis of transnational investment, FDI inflows, and adjusted net savings suggests that in the current development environment there is a functional relationship between FDI inflows and ANS.

For further research, let's build a linear model (1):

$$y_n = b_0 + b_1 x_n \tag{1}$$

where, y_n — expected value of foreign direct investment inflows;

x_n — chain growth rate of adjusted net savings in the countries under study;

b — value of the functional dependency.

To build a functional dependence, let us present in a tabular form the dynamics of FDI inflows, USD mln and the calculated chained growth rate for each country under study for the period 1970-2019 (table 2), presenting the growth rate of FDI inflows in the selected countries as X_n and the absolute values of FDI inflows as Z_n .



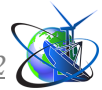
Table 1 - Correlation between investment flows of recipient countries and TNC-donors

| Recipient country | | | TNC-donors | | |
|-------------------|-----------------------|---------------|--------------------------------|--|----------------------|
| Country | FDI inflows, USD mln. | ANS, USD bln. | TNC, country of origin | Volume of transnational investment, USD bln. | Investment sector |
| 1 | 2 | 3 | 4 | 5 | 6 |
| KHP | 34298 | 2601000 | Toyota, Japan | 10.2 | motor vehicle |
| | | | Apple Inc., USA | 42,0 | digital technologies |
| | | | ArcelorMittal, Luxembourg | 5.7 | energy |
| | | | Pfizer (PFE), USA | 57.2 | pharmaceutical |
| | | | AnheuserBusch InBev, Belgium | 1.9 | food industry |
| CIHA | 347063 | 1061313.7 | Lenovo, PRC | 1.5 | electronics |
| | | | Sinopec Group, PRC | 2.4 | energy |
| | | | Sinochem, PRC | 1.7 | energy |
| | | | Alibaba Group Holding Ltd, PRC | 0.6 | electronics |
| | | | Anbang Insurance Group Co Ltd | 7.9 | insurance services |

Source: compiled according to [4, 6]

Table 2 - Dynamics of FDI inflows and chain growth rates for the period 1979-2019.*

| Years | FDI inflows to the PRC, USD mln (Z2) | Chained growth rate of FDI inflows to the PRC (X2) | FDI inflows USA, USD mln (Z5) | Chained growth rate of FDI inflows to the USA(X5) |
|-------|--------------------------------------|--|-------------------------------|---|
| 1979 | 0,08 | 0 | 8050 | 0,31677 |
| 1980 | 57 | 0,99859 | 16740 | 0,519116 |
| 1981 | 265 | 0,78490 | 25680 | 0,348131 |
| 1982 | 430 | 0,38372 | 21230 | -0,20961 |
| 1983 | 636 | 0,32389 | 11500 | -0,84609 |
| 1984 | 1258 | 0,49443 | 25230 | 0,544193 |
| 1985 | 1659 | 0,24171 | 9630 | -1,619 |
| 1986 | 1875 | 0,1152 | 30946 | 0,688 |
| 1987 | 2314 | 0,18971 | 63235 | 0,511 |
| 1988 | 3194 | 0,27551 | 56910 | -0,111 |
| 1989 | 3393 | 0,05865 | 75780 | 0,249 |
| 1990 | 3487 | 0,02695 | 71230 | -0,063 |
| 1991 | 4366 | 0,20132 | 34550 | -1,061 |
| 1992 | 11156 | 0,60864 | 30310 | -0,139 |
| 1993 | 27515 | 0,59454 | 50230 | 0,3965 |
| 1994 | 33787 | 0,18563 | 55940 | 0,102 |
| 1995 | 35849,2 | 0,05752 | 69080 | 0,1902 |
| 1996 | 40180 | 0,10778 | 97660 | 0,2926 |
| 1997 | 45439 | 0,11573 | 122150 | 0,2004 |



| | | | | |
|------|----------|---------|--------|---------|
| 1998 | 45644 | 0,00449 | 211150 | 0,4215 |
| 1999 | 41014 | -0,1128 | 312449 | 0,324 |
| 2000 | 42095,3 | 0,02568 | 349125 | 0,105 |
| 2001 | 47053 | 0,10536 | 172496 | -1,023 |
| 2002 | 53073,6 | 0,11343 | 111055 | -0,553 |
| 2003 | 57900,9 | 0,08337 | 117106 | 0,0516 |
| 2004 | 68117,2 | 0,14998 | 213641 | 0,4518 |
| 2005 | 104108,7 | 0,34571 | 142344 | -0,5008 |
| 2006 | 124082 | 0,1609 | 298463 | 0,52307 |
| 2007 | 156249,3 | 0,2058 | 346613 | 0,13891 |
| 2008 | 171534,7 | 0,0891 | 341092 | -0,0161 |
| 2009 | 131057,1 | -0,3088 | 161083 | -1,1174 |
| 2010 | 243703,4 | 0,4622 | 264039 | 0,38992 |
| 2011 | 280072,2 | 0,1298 | 263497 | -0,0020 |
| 2012 | 241213,9 | -0,161 | 250345 | -0,0525 |
| 2013 | 290928,4 | 0,1708 | 288131 | 0,13114 |
| 2014 | 268097,2 | -0,0851 | 251856 | -0,1440 |
| 2015 | 242489,3 | -0,105 | 509087 | 0,50527 |
| 2016 | 174749,6 | -0,3874 | 494439 | -0,0296 |
| 2017 | 166083,8 | -0,0521 | 354649 | -0,3941 |
| 2018 | 203492 | 0,1838 | 258390 | -0,3725 |
| 2019 | 34298,9 | 0,2268 | 347063 | 0,25549 |

Source: compiled and calculated independently based on data from [6,8]

Using the data analysis, information gathering, and forecasting software Statistica 12.0 and Data Analysis in Microsoft Office Excel, we will obtain the correlation of the variables of the linear multiple regression model of the dependence of foreign direct investment inflows on adjusted net savings for each country (table 3) [5].

Table 3 - Correlation of variables of a linear multiple regression model

| Correlation of model variables for the USA | | Correlation of model variables for the PRC | |
|--|---|--|---|
| 1 | | 1 | |
| -0,08895 | 1 | 0,333598 | 1 |

The variance analysis of the model and the main regression statistics are shown in (table 4) and (table 5).

Table 4 - Analysis of variance of a linear multiple regression model

| | USA | | | | | PRC | | | | |
|------------|-----|---------|--------|--------|----------|-----|---------|--------|--------|----------|
| | df | SS | MS | F | F value | df | SS | MS | F | F value |
| Regression | 1 | 1,59993 | 1,5999 | 0,3828 | 0,539013 | 1 | 0,08838 | 0,0883 | 2,1288 | 0,162784 |
| Balance | 48 | 200,597 | 4,1791 | | | 17 | 0,70581 | 0,0415 | | |
| Total | 49 | 202,197 | | | | 18 | 0,7942 | | | |

Below are summarized results of economic and mathematical modelling for the countries under study in tabular form (table 6).



Table 5 - Basic regression statistics

| Variables and number of periods | Basic regression statistics | | | | | |
|---------------------------------|-----------------------------|--------------------|--------------|----------|-----------|-----------|
| | Ratios | Standard deviation | t-statistica | p-value | Lower 95% | Upper 95% |
| N=18 | | | | | | |
| U-section | -0,60547 | 0,808596 | -0,7488 | 0,464846 | -2,31962 | 1,108673 |
| U-section | -0,17547 | 0,28952 | -0,60608 | 0,547316 | -0,75759 | 0,406646 |
| FDI inflows to the USA | 0,76536 | 1,236968 | -0,61874 | 0,539013 | -3,25245 | 1,721728 |
| N=19 | | | | | | |
| U-section | 0,001156 | 0,066341 | 0,017419 | 0,986305 | -0,13881 | 0,141124 |
| FDI inflows to the PRC | 0,697755 | 0,478229 | 1,459041 | 0,162784 | -0,31122 | 1,706729 |
| N=14 | | | | | | |
| U-section | -0,11127 | 0,181502 | -0,61307 | 0,545844 | -0,48674 | 0,264192 |

Table 6 - Summarized results of economic and mathematical modelling

| Countries | The equation describing the relationship between FDI and ANS |
|------------|--|
| PRC | $y_3 = 0.001156 + 0.697755x_1$ |
| USA | $y_4 = -0.17547 + 0.76536x_1$ |

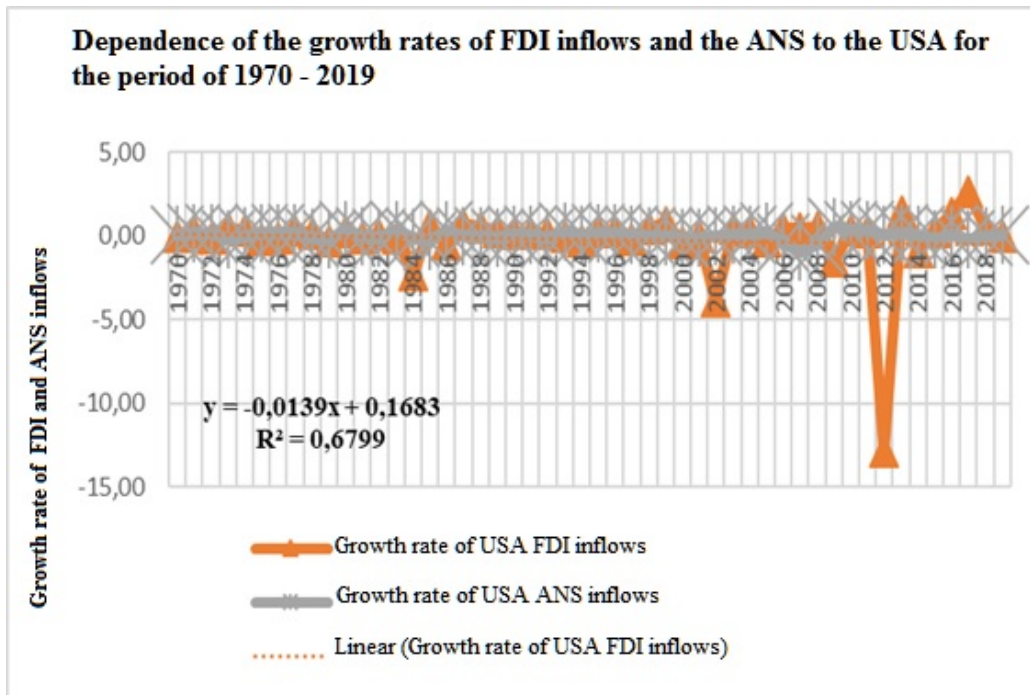
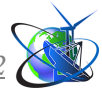
Source: compiled by own

Having constructed the functional dependence of FDI inflows (y) on the ANS (x1), we determine that the trend line of the formed dependence corresponds to the linear type of equation, and the key indicators of the model's adequacy (R2 = 0.88774, correlation coefficient = 0.9857) prove the correctness of the model and the existence of a direct and strong relationship between y and x1.

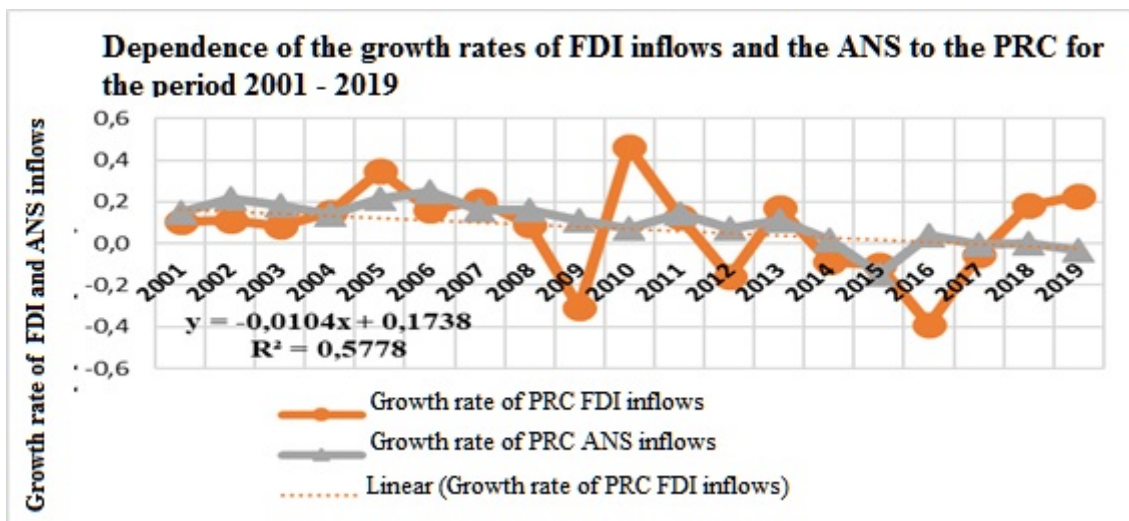
Our calculations show that adjusted net savings are significant and influential on FDI inflows for the USA and the PRC (values of 0.765 and 0.698, respectively), which we believe is due to a strong strategy to support digital development, increased funding for education, and increased cooperation between training centres and corporations.

Now we can graphically present the results using the Microsoft Office Excel Data Analysis software and demonstrate the correlation of the variables of the linear multiple regression model of the dependence of FDI inflows on adjusted net savings for each country (figure 2).

Therefore, to summarize, the proposed methodological tools for identifying the determining role of the level of adjusted net savings as a stimulating factor for increasing the inflow of transnational capital to the recipient country using economic and mathematical modelling based on the author's approaches demonstrated the strong dependence of the PRC and the USA and their corporations on adjusted net savings.



a) Functional dependence of the growth rates of FDI inflows and the ANS of the USA



b) Functional dependence of the growth rates of FDI inflows and the ANS of the PRC

Source: designed and built by own

Figure 2 - Functional dependence of FDI inflows and ANS of the countries under study

Conclusions.

Under conditions of crises and cyclicity, business entities need to use borrowed and investment resources to operate for a long time and develop their business. The post-crisis period after 2009 requires new measured and balanced optimal investment decisions from TNCs. This situation is due to the fact that there are numerous factors in host countries that influence the economic behaviour of TNCs. At the same time, in the context of limited natural and human resources, the concept of “sustainable development” has become relevant, which covers three most important components: economic, environmental, and social. All of this allows us to take care of the development of future generations and preserve the environment.



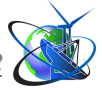
TNCs are among the largest exporters of capital and drivers of international capital flows. In order to be competitive, the goal of TNCs should be to move to a modern technological level, taking into account the emergence of biotechnology, neurological control systems, space exploration, etc. The role of TNCs' investment activity is to ensure social standards of living for the citizens of the host country. But at the same time, they face competitive advantages of corporations, which to some extent reduces the influence of national enterprises on the economy.

Strategic planning of investment activities of TNCs requires constant monitoring of their own expenses and income from the implementation of investment projects. Investment efficiency is assessed using a large number of methods and techniques. The management of a TNC constantly compares markets and investment objects in different regions of the world, creating so-called matrices of returns and risks of a certain type of investment project. Only after evaluating and analysing all available options does a TNC start its own investment activities.

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Анотація. В умовах одночасного розвитку процесів глобалізації і деглобалізації турбулентного середовища, яке постійно каталізує зміни напрямків та об'ємів міжнародних інвестицій ТНК, виникає потреба моніторингу сучасного стану міжнародного інвестування. Приймаючи країни та країни базування корпорацій прагнуть покращувати свій інвестиційний клімат з метою ефективного використання власних та залучених фінансових



ресурсів.

У представленій роботі шляхом компаративного аналізу продемонстровано новий методичний інструментарій виявлення значення рівня скоригованих чистих заощаджень (СЧЗ) як стимулюючого чинника для збільшення припливу транснаціональних інвестицій (ПІІ) до країни-реципієнта. Із застосуванням економіко-математичного моделювання на основі авторських підходів виявлено ступінь впливу СЧЗ на обсяги транснаціональних ПІІ.

Виникає велика кількість науково-практичних дискусій стосовно ключових мотивів і чинників, що мають первинне значення для формування чистих заощаджень. Виявлення найбільш важливих із них, зокрема обсягів транснаціонального інвестування, носить відносний характер і залежить від правового, культурного, інформаційного середовища країни.

Ключові слова: скориговані чисті заощадження, конкурентоспроможність, економетричні оцінки, методичний інструментарій.

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