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Analysis of free economic zones functioning in the Asian Region

Abstract. For the justification of effectiveness of the integration processes by the means of creation of free economic zones, in the article is carried out the analysis of influence of free economic zones on the development of the economy of the Asian countries, such as: Indonesia, Malaysia, North Korea, Singapore and China. Using the econometric methods is showed the influence of foreign capital on the level of development of the state and is suggested to consider the free economic zones in the modern economy as a way for strengthening of the integration processes.
Keywords: Region; Free Economic Zones; Economic Growth; Asian Region
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Аналіз функціонування вільних економічних зон в Азійському регіоні
Анотація. Для обґрунтування ефективності процесів інтеграції за допомогою створення вільних економічних зон (ВЕЗ) у статті проаналізовано вплив ВЕЗ на розвиток економіки Азіатських країн, серед яких Індонезія, Малайзія, Республіка Корея, Сінгапур і Китай. З використанням економетричних методів, автором показано вплив іноземного капіталу на рівень розвитку держави. Запропоновано розглядати вільні економічні зони в сучасній економіці як ключовий фактор посилення інтеграційних процесів.
Ключові слова: регіон; вільні економічні зони; економічне зростання; Азіатський регіон.

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Анализ функционирования свободных экономических зон в Азиатском регионе
Аннотация. Для обоснования эффективности процессов интеграции с помощью создания свободных экономических зон (СЭЗ) в статье проанализировано влияние СЭЗ на развитие экономики азиатских стран, среди которых Индонезия, Малайзия, Республика Корея, Сингапур и Китай. Используя эконометрические методы, автором показано влияние иностранного капитала на уровень развития государства. Предложено рассматривать свободные экономические зоны в современной экономике как ключевой фактор усиления интеграционных процессов.
Ключевые слова: регион; свободные экономические зоны; экономический рост; Азиатский регион.

1. Introduction

In order to explain why some countries develop faster than others and how to speed up the economic growth; that determines the rate of increase of GDP, i.e., to understand the inter-country and inter-temporal differences in the level of real GDP (and real GDP per capita) and for our research to identify factors, influencing on economic growth rate of states, it is necessary to consider the level of GDP growth of the country, depending on a number of factors.

2. Brief Literature Review

A number of authors support the hypothesis, concerning the influence on economic growth of the state investments – R. Levayn, D. Renelt [6], M. Blumshtrom [3], and R. Ram [9]. However, such authors as D. Landau [5], K. Graye [4], G. Tullok [4], R. Barrow [2] prove a negative impact on the economic growth of states.

For the confirmation of hypothesis, concerning the increase of living standards of the population, depending on the growth of number of free trade zones, we suggest to carry out the correlation analysis.

3. Purpose

To evaluate the influence of free economic zones on the development of the economy of the state using the econometric methods.

4. Results

Thus, let's carry out the economic analysis of development of countries in five years on the following factors – GDP growth (in %), GDP per capita and the level of foreign investments. Thus, Indonesia have 7 free zones and 40 industrial zones. The most famous duty free zone is Batam, which is in direct proximity to Singapore and Batam Island, it includes Rempang and Gala. According to the established laws in Indonesia, the company of duty free zone is necessary to export at least 2/3 of its production.

The foreign investments are concentrated mainly in industrial and production zones, in Indonesia there are 51 zones. Within the frameworks of integration of ASEAN in Indonesia are created free trade zones between the countries – members of the group, as well as China, India, South Korea and Japan. Indonesia is located in the equatorial part and is attractive for tourists; therefore, on the Bali Island and the other Sunda Islands is created tourist and recreation zone [5, 48].

For the successful development of FEZ in Bitam and Bintam were distinguished seven key areas for the cooperation, creating the conditions for the entrepreneurial development, regulatory conditions and labor conditions in Batam and Bintan, favorable for investors. Below are represented these areas [1,p. 57]: investment, finances and banking, taxation, customs and excise taxes, immigration, labor forces and development of potential of FEZ.

One of the major problems of development of entrepreneurial activity on the Indonesian Islands is the lack of official names: because of anonymous there are no budget allocations. For current 2013 of 9634 islands, making up the largest archipelago of the world don't have the names, while the «child rites» had passed 7870, noticed Nurjaman[8, p.164].

As we can see from the data represented in the table 1, the GDP growth of Indonesia in 2011 was increased by 55. 8%, 2012 was marked by the recession of more than 2 times and was only 1.54%, however, by 2014 the Indonesian government planned to increase the growth to 2.47%.

The Republic of Korea has been chosen as the following state for carrying out an analysis. From the countries of East Asia of special interest is the experience of creation and func-

Tab. 1: **The analysis of economic indicators of Indonesia in 2010–2014**

Country	2014	2013	2012	2011	2010
GDP growth,%	2,47	1,39	1,52	3,4	1,9
Income per capita,$	1810,31	1732,18	1650,63	1570,15	1498
Foreign Direct Investment, Billion IDR	72000,00	71200,00	67000	56100	43100

Source: Own processing based on [12], [13]

tioning of FEZ «Masan» in the Republic of Korea (established in the early 1980s). Masan zone was created with the following objectives:

1. To attract in the country the foreign investments;
2. To develop export;
3. To increase employment of working population;
4. To attract the modern technologies and know-how in the South Korean economy.

Masan zone occupies an area of 803 squares kilometers, including the rented 532 square kilometers on which there are 84 industrial production buildings located. The rest area belongs to FEZ and on it is placed there are five buildings and enterprises, providing the servicing areas. The infrastructure of Masan zone includes the rail and sea transport, unloading, handling, packing, maintenance and other services [8, p.143].

In the Masan zone it is guaranteed the preservation of capital, profit repatriation on the capital of foreign investors, as well as dividends from the sale of shares and other capital gains.

Thus, the represented data in the table 2 testify that since 2011 was marked the GDP recession, if in 2010 the growth was 6.5%, then in 2011 the decline was almost twice and reached the level of 3.7% and in 2012 – 2.3%.

The following state of Asia region is Malaysia, where is

Tab. 2: **The analysis of economic indicators of the Republic of Korea in 2010–2014**

Country	2010	2011	2012	2013
GDP growth,%	6,5	3,7	2,3	3,0
Income per capita, $	22 151	24 156	24 454	25 977
Foreign Direct Investment, Billion $	9497,4	9773,0	9495,9	12 220,7

Source: Own processing based on [12], [13]

accumulated considerable positive experience of creation, control and management of activity of free economic zones. For the first time the law on free trade zones was adopted in Malaysia in 1971. Later was required its actualization and in 1990 was adopted a new law on free zones (FZL) and regulations there under [1, p. 169].

In Malaysia were created and are functioning 25 free zones, including 11 free trade zones, in which is implemented the dismantling of large consignments, sorting, repacking, labeling, is carried out a transit (re-export) trade and 14 free industrial trade zones in which is established industrial enterprises are fully oriented for export. In some cases, for such enterprises the part of production (up to 20%) is allowed to supply in the domestic market. As a rule, in free industrial zones are used imported raw materials and components for finished-product output. However, in the cases, when, it is possible is encouraged the use of raw materials and components of local production.

The data of table 3 showed that Malaysia as well as considered by us Indonesia and North Korea experienced a decline of GDP in 2012 – 2014. However, despite the decline of GDP – the growth of income per capita had increased – thus, if the income in 2010 were 5984 US dollars per capita, then, according to the forecast of IMF it would be 6990 dollars per capita that constituted 14.6% of growth.

The formation of FEZs in Masai led to the sharp increase of foreign direct investments in 2014 the inflow

of FDI in 2014 increased almost in 96 times in comparison with 2010.

Further, let us consider the stages of formation of FEZ in Singapore. Singapore is focused on export of goods, for the organization of export production the government of Singapore announced a number of areas the industrial zones, fully equipped for the establishment of industrial enterprises. Therefore, the government of the country made the decision to create in the port area of Singapore and Jurong port the free trade zone. Besides that, in the country began to create industrial zones, i.e., a kind of export-oriented enterprises. The state financed the establishment of industrial infrastructure, including roads, electricity and water supply, communications system and telecommunications.

Tab. 3: **The analysis of economic development of Malaysia in 2010–2014**

Country	2010	2011	2012	2013	2014
GDP growth,%	0,8	2,7	1,8	1,52	1,4
Income per capita,$	5984,42	6318,9	6531,32	6786	6990,25
Foreign Direct Investment, Billion,$	4,4	5,2	148	139	137

Source: Own processing based on [12], [13]

A special program for the development of industrial zones of Singapore was adopted in 1970 by the law on «Economic Expansion Incentives Act». According to this law the enterprises that have invested in the economy 710 thousand dollars have gained a status of «pioneer» and exempt from payment of taxes for five years. If the enterprises produced products for export, then the exemption remained in force for 10 years, the enterprises which did not have such status, but produced products at the cost of 71 thousand dollars and 20% of which went into export also exempted from taxes for five years [8, p. 64].

Singapore is the country that has achieved success due to the creation of FEZ. Over the 1966 to 1999 the rates growth in the country was about 9.9%. It should be noted that from 2011 to 2013 the GDP growth per capita in Singapore was increased by 5.01%, thus in 2011 the income per capita was 61,413 dollars, but in 2013 – 64584 dollars. As we can see from the data represented in table 4, the income per capita in Singapore is constantly growing and in 2014, according to the preliminary forecast it will increase in 20.1% in comparison with 2010. It is one of the highest rates in the world economy [8, p. 86].

The following state of Asia region is China. Currently, in China function 14 ZNBECs of the state level, created for the development of the economy of near-border regions of the country on the basis of expansion of direct trade relations with neighboring states. «Open» port cities provide 2/5 of export and almost 100% of cargo turnover of seaports. The productivity here is in 2/3 is higher than average level of China [8, p. 145].

With the advent of FEZs in China were established the appropriate bodies of administration management: the office of secretary of the State Council of PRC for affairs of FEZ is the supreme body of administration management of FEZ. It develops the main social and economic settings and supervises the execution of their implementation, controls the other depart-

Tab. 4: **The analysis of economic development of Singapore in 2010–2014**

Country	2010	2011	2012	2013	2014
GDP growth,%	18,2	5,22	2,47	4,9	2,2
Income per capita	30700,47	34758,4	36102,75	36110,13	36897,14
Foreign Direct Investment, Billion$	626	679	747	_	2626,0

Source: Own processing based on [12], [13]

ments in that part of their activity, which refers to FEZs. The offices of secretary are subordinated to the administrative and managerial Committees of FEZs (develop plans of development, examine and approve the investment projects, their registration, dealing with the issues of labor and wages, education, healthcare, culture and public order). Besides that, in zones are functioning local people's congresses, party and trade unions organizations, and other internal structural units.

In the functioning of FEZs of China a major role belongs to banks. There in foreign transactions are mainly engaged the Bank of China and the China International Trust Investment Company (CITIC). Along with this, the right to carry out the exchange payments is granted to the other banks, both for Chinese, foreign and joint venture banks.

All banks, located in FEZs operate with deposits, shares, and other securities in foreign currency. They are allowed to create foreign exchange markets, borrow or to lend foreign currency to the other FEZs of Republic of China [1, p. 134].

In Chinese FEZs are very actively operate the foreign banks. They are oriented to the international business, serve JV and foreign companies. They are allowed to be engaged in: foreign trade financing and individual projects; lending in currency and deposit taking from JV; currency conversion operations; serving the Chinese enterprises and organizations with some restrictions.

The currency regulation in China implements the State Administration of Currency Control (SACC), acting in the system of the National Bank of China. At the disposal of all banks, registered in China, there is a single interbank foreign exchange market, within the frameworks of which is bought and sold foreign currency.

The density of investments of foreign participant, according to the laws, must not be less than 25% of the equity capital; otherwise, the enterprise can't have the status of JV. It is allowed the establishment of the enterprises, entirely belonging to the foreign capital. The duration of the enterprise can be not limited. The state provides a guarantee to the enterprise against nationalization.

It is possible to identify the following peculiarities of the Chinese FEZs:

1. Gradual establishment and formation.
2. Widespread usage of foreign investments.
3. The main sectorial priority is industrial production.
4. Export and production orientation.
5. The attraction in the production of imported raw materials.
6. The Chinese tax system is differentiated by the regional specific features.
7. Management with participation of local and central government authorities.
8. Inclusion of extensive national regions.
9. Combination of market relations with socialist values.

Besides, the economic, an important role, in the creation of free zones has played a political motivation. In this section, we would like to dwell upon namely this circumstance.

Thus, the represented data in the table 5 testify that since 2010 was marked the GDP recession, if in 2012 the growth was 9.4%, then in 2014 the decline reached the level of 7.4%.

For the implementation of goals, concerning the increase of living standards of the population, depending on the growth of number of free trade zones, we suggest to carry out the correlation, regression analysis and the method of least squares.

Thus, the correlation analysis were used by us as, namely

Tab. 5: The analysis of economic development of Singapore in 2010–2014

Indicator	Year				
	2010	2011	2012	2013	2014
GDP growth, %	10,3	9,47	9,04	7,6	7,4
Income per capita, $	2611,16	2870,05	3121,27	3344,54	3583,38
Foreign Direct Investment, Billion, $ Jan.	900,33	1057,35	1160,11	1117,16	1062,41

Source: Own processing based on [12], [13]

this method allows evaluating whether there is a connection between the examined variables. In this case, we can use *correlation analysis*.

Usually, the dependent variable is called *effective sign;* it denotes Y and its specific numerical values – $y_1, y_2, ..., y_n$.

Factorial signs or *simple factors* are called values, determining the change of effective sign. Factorial sign denotes X, its specific numerical values – $x_1, x_2, ..., x_n$. If there are several factorial signs, then they denote $X_1, X_2, ..., X_m$, and their numerical values – $x_{11}, x_{12}, ..., x_{1n}; x_{21}, x_{22}, ..., x_{2n}; ...; x_{m1}, x_{m2}, ..., x_{mn}$.

The goal of the correlation analysis is to determine the degree of dependence.

Pair correlation characterizes the nature of dependence between two signs: effective (dependent) and factorial (independent). Pair correlation depends on the nature and intensity of influence of all considered values.

The value of linear connection of two signs characterizes *the coefficient of linear correlation* which is denoted r.

The value of correlation coefficient can be calculated by the following formula *(Pearson correlation coefficient):*

$$r = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2}\sqrt{\sum_{i=1}^{n}(y_i - \bar{y})^2}} = \frac{n\sum_{i=1}^{n}x_iy_i - \left(\sum_{i=1}^{n}x_i\right)\left(\sum_{i=1}^{n}y_i\right)}{\sqrt{n\sum_{i=1}^{n}x_i^2 - \left(\sum_{i=1}^{n}x_i\right)^2}\sqrt{n\sum_{i=1}^{n}y_i^2 - \left(\sum_{i=1}^{n}y_i\right)^2}}, \quad (1)$$

where $\bar{x}$ and $\bar{y}$ mean values of X and Y:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n}x_i, \bar{y} = \frac{1}{n}\sum_{i=1}^{n}y_i.$$

n is a sample number; i is a number of observation.

The value of correlation coefficient ranges from -1 to 1. In the table 6 is represented the possible correlation coefficient and corresponding characteristics of force and direction of dependence [11, p. 34].

Tab. 6: **The possible value of correlation coefficient**	
Values of correlation coefficient	**Linear dependence**
-1	Functional and negative
0	Does not exist
1	Functional and positive
$\lvert r \rvert < 0.5$	Weak
$0.5 \leq \lvert r \rvert \leq 0.8$	Average
$\lvert r \rvert \geq 0.8$	strong

Source: [11, p. 34]

The correlation coefficient can be calculated in MS Excel, using CORREL functions.

Depending on the type of function $f(x, \beta)$, the models are divided into linear $f(x, \beta) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_n x_n$ and nonlinear.

The field of application of such models, even linear is much wider than the time–series models. The problems of estimation theory, verification, selection of relevant parameters and and the other is devoted to a huge amount of literature.

This topic is pivotal in econometrics [11, 38].

On the basis of data represented in the Tables 1–4, let us carry out the correlation analysis. The correlation analysis of countries' GDP growth dependence from foreign direct investments over 2010–2014 period of time.

The data of the Table 7 showed that a correlation coeffcient between the two given parameters of Indonesia was 0.98965874. The calculated dependence, using the software is high. On the basis of represented data, let's carry out the correlation analysis of Republic of Korea the economic development of the state. Thus, the correlation coefficient is 0.84334.

Further, we provide the calculations correlation coefficient of Malaysia. The pair correlation coefficient was 0.842315786, which demonstrates high level of

Tab. 7: The Calculation of Correlation Coefficient of GDP growth and income per capita and the level of foreign direct investments dependence

Parametr	Indonesia	Republic of Korea	Malaysia	Singapore	China
Correlation coefficient	0.98965874	0.84334	0.842315786	0.997448	-0.23497

Source: The Author's calculations

dependence of specified parameters. According to the calculations In Singapore correlation coefficient is 0.997448.

5. Conclusions

The carried out research has showed that foreign direct investments affect the economic growth of the states in the Asian region. For their attraction, the countries of the Asian region are actively use such an instrument as creation of free economic zones. For the attraction of FDIs, states propose tax benefits for foreign capital, which finally leads to the increase of income and population of the country. It should be noted that the calculations carried out according to the data of the economy of China are different from the indicators of the other countries (Indonesia, the Republic of Korea, Malaysia, and Singapore), and there is no correlation (correlation coefficient is –0.23497). Perhaps, it is required to increase the statistical sampling or continue to find other indicators. However, it is obvious for the economy of China that with the increase of FDIs, the GDP growth per capita of population is increasing.

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