Cumulative analysis of dependence government tax behaviour on economy's efficiency factors for totality the world countries

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Abstract

The article deals with an investigation of principles, factors, and conditions of the government tax behaviour by changing the tax rate. The research base is all countries in the world for which statistics are available.

We define a set of potential indicators of the economic efficiency, based on GDP and FDI, nominal and per capita, as well as the ratio of FDI to GDP. By using the statistical analysis techniques we found a correlation between government behaviour and each of the selected indicators. In order to reduce the randomness of the results, we carry out cumulative testing of the hypothesis of independence of government tax behaviour from the efficiency of the economy for all possible partitions of the countries' totality with different interrelations of the countries' sets behaviour with different economic efficiency levels.

Based on the research, it can be argued that government tax behaviour, in general, is not maximizer behaviour. We argue that the factors GDP, FDI, and GDP per capita have the biggest impact on the government tax decisions. The obtained results allow to understand the principles of governments' decision-making, and, therefore, to forecast in some way their behaviour in certain economic conditions. In particular, partitions accumulations can help identify behavioural trends.

The present paper differs from previous studies both by the topic, studying the relations between government's tax behaviour and efficiency of countries' economies and by the approach to define this dependence, since the latest can be observed only when each variant of government's tax reaction is analyzed separately.

Keywords: economic efficiency; tax rate; government tax behaviour; CIT; GDP; FDI; per capita

JEL code: C12, E22, H30

Introduction

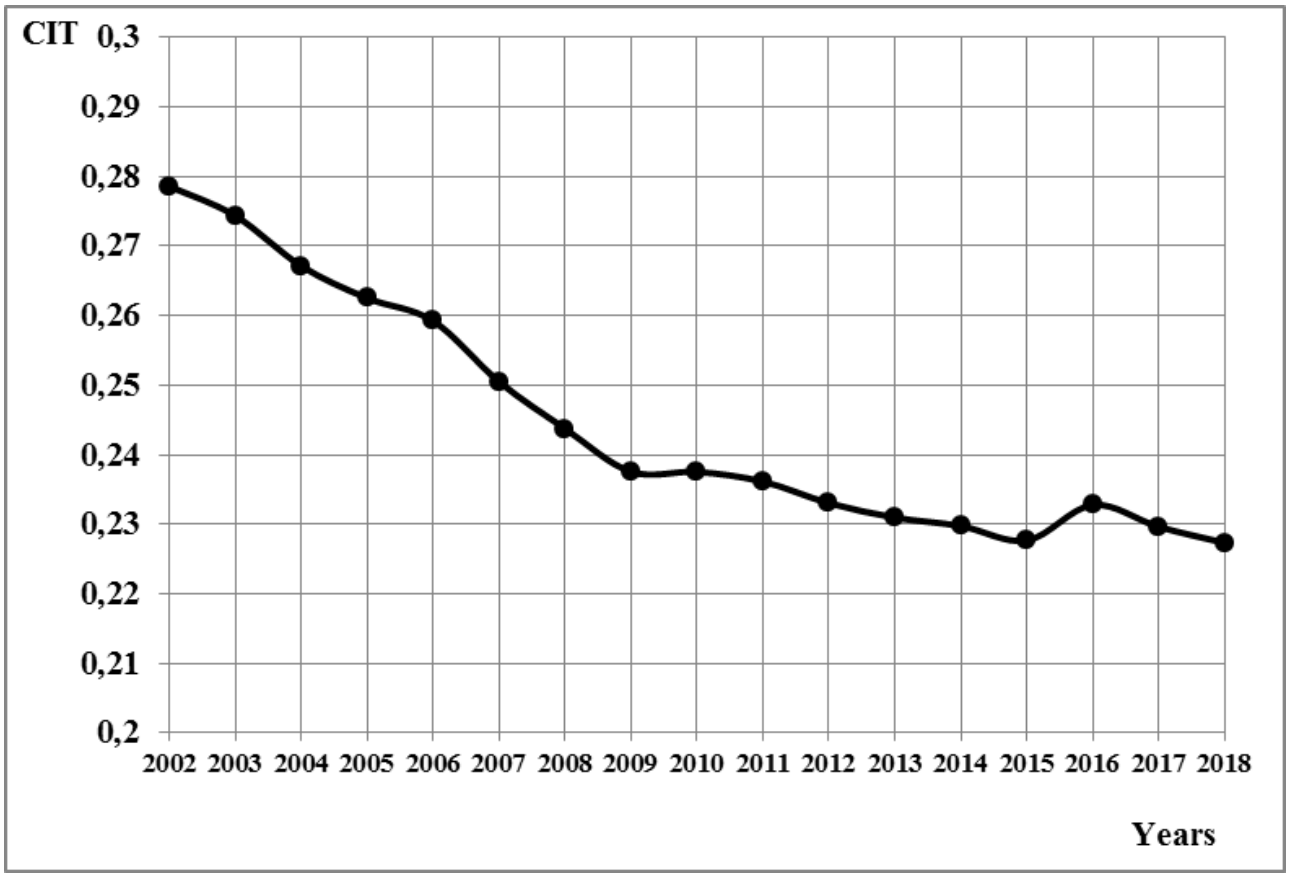
The research is directed toward an investigation of principles of government economic behaviour. More precisely, her object of research is the use of the tax burden to regulate the economy. As is known ones of the main functions of taxes are fiscal function, when the government collects taxes in order to fulfill the budget for providing its own economic and social policy, and also regulatory function, consisting in the adjustment of the state's economic policy and of appropriate economic relations.

The research of tax behaviour of governments cover in fiscal direction the problems of budgeting, issues of optimal taxation rate for maximizing of budget revenue (see e.g. Mirrlees, 1971, Atkinson and Stiglitz, 1972, Aiyagari et al, 2002). On the other hand, in the area of economy's regulation research of tax behaviour is a key tool for clarification the mechanism of functioning of incentives for economic development of the country. Usually, by increasing taxes the government, *ceteris paribus*, aims to raise budget revenue. Reducing the tax burden it induces the additional investment inflow caused by improvement of economic environment. Under this fiscal aspect the government faces the contradiction between the need to fulfill budget and to improve the economic climate by means of adjustment of the tax burden.

So, a government has three alternative variants of tax behaviour, namely, to reduce the tax rate in order to improve economic conditions and to attract new investors; to increase the tax rate as a way to raise budget revenue; or to fix the tax rate, i.e. refuse to use this tax instrument at all.

The generally recent trend is decreasing of CIT rate. The analysis of CIT rate for 114 countries for which statistics are available from 2002 till 2018 (Corporate tax rates table, 2019) shows as for this time horizon the average CIT rate reduced by 4,89%: from 27,86% to 22,73% (Fig. 1).

Fig. 1. CIT change in world countries from 2002 until 2018 years



Source: (Corporate tax rates table, 2018); authors' calculations

The number of countries in the sample are from 101 in 2002 and 2003 years to 148 in 2016-2018 years

It shows that governments use not only the financial component, but also the regulator when choosing their tax decisions. Certainly there are many factors influencing the choice of governments, but can assume in generally government tax behaviour is based on analysis of macro-economic indicators. It is a main hypothesis of this research. Therefore the purpose of research is check dependence of government tax behaviour on selected indicators.

Literature review

The theme financial behaviour, in particular, tax behaviour was taken up by (O. Weber, J. Fooken, B. Herrmann), (A. Krishna, J. Slemrod), (A. Laffer, W. Winegarden, J. Childs), who specifically investigated the issue of tax regulation to optimize the economic activity of agents.

The government tax behaviour

The large part of researches focused on the patterns of government tax behaviour in different economic conditions.

Mirrlees et al. (2011) in the final report from the Mirrlees Review "Tax by design" developed some important patterns of the government's tax behaviour, notably, they underlined the central role of redistribution in the tax and benefit system and the importance of maintaining neutrality.

Weber et al. (2014) investigated government behaviour and taxation. They found that behavioural economic factors can significantly influence tax compliance, and if well applied, usually cause an increase in compliance; these behavioural factors affect decision-making in ways that are important for making good tax policy.

Another set of papers studies the aspects of government behaviour influenced by different institutional factors. Thus, Krishna & Slemrod (2003) analyzed the tax behaviour of the government aiming to minimize the perceived burden addressing particularly to the ethical and normative implications of price presentation in the tax system. Avi-Yonah (2011) found general conditions under which taxation as regulation makes sense: it should apply to small numbers of taxpayers; the taxpayers are sophisticated and able to deal with complex tax incentive and the regulatory goal is clear and related to the level of the tax.

Leicester et al. (2012) analyzed behavioural aspects of government's tax and benefit policy intervention taking into account such behavioural insights like bounded rationality, framing, time inconsistency, social preferences, etc.

The administrative techniques and institutions for the management of tax complexity were investigated by Freedman (2015). She concluded that institutions can also improve tax systems and sometimes reduce complexity, but this

simplification will only be achieved if the institutions are conceptually coherent with clear tax policy objectives.

Pecorino (1995) investigated tax rates and tax revenues in a model of growth through human capital accumulation. The relationship between tax rates and the present value of tax collections is analyzed in an endogenous growth setting. In such a model, income taxation may reduce the size of the tax base in current and future periods through both labor supply and growth rate effects.

Laffer et al. (2011) estimated the economic burden caused by the Tax Code complexity. They outlined that the potential benefits to economic growth could be from a reduction in tax complexity. Under the establishment of the low rate flat tax on a broad tax base, the inefficiencies caused by Tax Code complexity, notably, administrative costs, time costs, and compliance costs would be substantially reduced. As a result, overall economic efficiency would increase, as well as the growth in income and wealth.

Analysis of the mutual influence of CIT and FDI

C. D. and D. H. Romer (2010) investigated the impact of tax changes on economic activity. The authors identified the size, timing, and principal motivation for all major postwar tax policy actions. It allows us to separate legislated changes into those taken for reasons related to prospective economic conditions and those taken for more exogenous reasons.

Schraztenstaller, Wagener, and Kohler-Toglhofer (2005), Feld and Heckemeyer (2008), etc. confirm the negative relation between corporate taxation and foreign direct investment (FDI), i.e. that lower tax rate represents stimulate the inflow of FDI and conversely.

Becker (2009) confirms the corporate taxation increase results in a decrease in tax revenues because of the lower inflow of FDI into the economy. However, this statement does not always correspond to practical research. A more full outline of the issue is given by the model (Chalk, 2001) that analyzes a classical graphical model of conditions of increasing the tax revenue due to the reduction of the tax burden. This

analytical model of the optimal tax burden is rather abstract; it is could be used in an arbitrary economic system.

Other models of fiscal (notable tax) behaviour and the impact of tax changes on the state of the economy were considered, in particular, in the works of Wanniski, 1978, Judd, 1985, Chamley, 1986, Laffer, 2004, Trabandt and Uhlig, 2011, Werning, 2007).

Afonso and Hauptmeier (2003) analyzed the determinants of government's fiscal behaviour in EU countries. Their results show that the existence of effective fiscal rules, the degree of public spending decentralization, and the electoral cycle can impinge on the country's fiscal position.

In summary, we can conclude that current studies mainly investigate government tax behaviour (policy) from the standpoint of expediency of certain regulatory and adjustment measures. Any government considers its own economy as perfect or its own tax system as optimal. But at the same time by no means, all of them use the proposed instruments in order to improve the situation.

The studies of the causes of this fact, which we evaluate as important, are not sufficiently covered in the existing literature. Notably, we consider the insufficiently exhaustive and clear answer about government tax behaviour when it chooses the direction of change of the tax burden in certain economic conditions.

Consequently, the purpose of this paper is to determine factors and conditions, which influence on government's decision related to the choice of a certain type of tax behaviour. This allowed us to set the following tasks:

- ✓ to define a set of potential indicators, based on which the government makes a decision concerning certain economic (tax) behaviour;
- ✓ to identify if such dependence in fact exists;
- ✓ to analyze which indicators influence more over the government's economic behaviour;
- ✓ to define principles (nature) of the government response, i.e. under what conditions the government intend to increase the tax burden, to reduce it or to keep it at the same level;

✓ to define the character of government behaviour.

Data and methodology

In the article we analyze the economic behaviour of governments of world countries, which for the purposes of study can be regarded as adjustment of the corporate tax burden. It should be noted that in some countries, like Germany, the CIT rates, established by local authorities, differ by region. In this case we used a weight-average tax burden, adjusted by some central government.

Now the task is to examine the possible impact of the actual economic efficiency of the country on government's economic behaviour (i.e. on the changes of tax rates). GDP is the generally accepted indicator of power of the economy in the context of the world economic system while GDP per capita could be considered as indicator of the wealth of the economy.

The selection and rationale of indicators

Governments resolve on change of CIT rate, i.e. we have tax behaviour.

However because it is the behaviour of governments, that is, organizations, we do not consider the majority of indicators used by different theories of economic behaviour.

The government uses macroeconomic indicators, therefore, the task arises to check,

firstly, whether are government decisions independent of these indicators?

second, if they are dependent on those indicators whether government behaviour is rational or not?

It is generally admitted that Gross domestic product (GDP) calculated in one way or another is the best matched characteristic of the country economic power. As distinct from the power of the country's economy, its wealth is determined by GDP, normalized to country population – GDP per capita.

On the other hand, as already noted above, decrease of CIT rate is an instrument of improve the investment climate. Therefore is advisable to consider the

eventual influence of the value FDI (nominal, per capita, & per GDP) to change of CIT rate.

Sometimes it can find the name “investment attractiveness”, but then it is should talk about her absolute value, and for the normalized investment attractiveness should use derived indicator: ratio of FDI to GDP. In order to simplify the terminology for the last indicator we use the term “attractiveness of investment climate”.

In a priori, we do not reject any of the above indicators for evaluate the efficiency (power, wealth) of economy. Further in order to evaluate the efficiency of economy (in terms of power and wealth) we provide the formal estimation of the correlation between the changes of CIT rates and each of the selected indicators.

Rationale for sample

The sample contains all world countries, for which statistics for GDP, FDI, and their populations were available at the moment of researching.

The analysis of governments’ behaviour related to adjustment of the corporate tax burden in world countries

In order to determine principles of the government’s behaviour we investigate the correlation between changes of CIT rates and five selected indicators, which could be considered as characteristics of country’s generalized economic efficiency:

- ✓ GDP,
- ✓ FDI,
- ✓ GDP per capita,
- ✓ FDI per capita,
- ✓ FDI/GDP.

We explore the data for 13 years (2005-2017) for 114 world countries, because there is no reliable data for CIT rate for previous years.

The CIT rate change is calculated as the difference between the last and first indicator values.

The obtained results are presented in the Tables A1, A2 in Addition A.

Methodology

For confirmation or rejection of the independence hypothesis, we use a binomial asymptotic confidence interval for the mean. Binomial distribution was chosen because

- ✓analyzed events – the change annual tax rates by countries – for each of 3 investigated cases are discrete: the event (tax rate increase, tax rate decrease or invariance of tax rate) occurs or no;
- ✓it is assumed, the government of each country makes a decision regardless of the governments of other countries. We assume, governments of countries from different indicator's values use different strategies, but each government uses a certain strategy. Therefore in the distribution of countries in the economy's efficiency, we are following such requirements:
  - ✓the union of a set of countries, that present economies of a certain efficiency level, covers the whole set (in this case – 114 world countries);
  - ✓the intersection of a set of countries, that present economies of a certain efficiency level, the empty set;
  - ✓since we rank countries by increasing the efficiency indicator of the economy (severally for every indicator), then, clearly, all economies that were classified as low-efficiency precede economies that were classified as mid- and high-efficiency level; economies that were classified as mid-efficiency precede economies that were classified as high-level. I.e. at first there are all low-efficiency economies located, then – mid-efficiency ones, finally – high-efficiency economies ones.

It's formally,

$$S^e : S^e = \left\{ s_p^e : p = 1,2,\ldots,N \right\}$$

– is the sequence of countries of the set, ordered by increasing efficiency e ($N=114$);

$$S_l^e : S_l^e = \left\{ s_i^e : i = 1,2,\ldots,n_l \right\}$$

– is the sequence of countries of set with low-economy efficiency;

$$S_m^e:\ S_m^e = \left\{ s_j^e:\ j = n_l + 1, n_l + 2, \ldots, n_m \right\}$$

– is the sequence of countries of set with middle-economy efficiency;

$$S_h^e:\ S_h^e = \left\{ s_k^e:\ k = n_m + 1, n_m + 2, \ldots, N \right\}$$

– is the sequence of countries of set with high-economy efficiency.

A family of sets $S = \{x_i\}_{i=1,N}$ is a partition of X if and only if all of the following conditions hold:

- ✓ any set X_i in S is a subset of the set X;
- ✓ the intersection of any two distinct sets in S is empty (that is $\forall i, j: 1 \le i, j \le N,\ i \ne j:\ x_i \cap x_j = \varnothing$);
- ✓ the union of the sets in S is equal to X (that is $\bigcup_{i=1}^{N} x_i = X$).

Clearly,

$$S_l^e \subset S^e,\ S_m^e \subset S^e,\ S_h^e \subset S^e;$$
$$S_l^e \cap S_m^e = \varnothing;\ S_l^e \cap S_h^e = \varnothing;\ S_m^e \cap S_h^e = \varnothing;$$
$$S_l^e \cup S_m^e \cup S_h^e = S^e,$$

and so $\left\{ S_l^e,\ S_m^e,\ S_h^e \right\}$ is a partition of S^e.

A dependence estimate government tax behaviour is determined on the на basis of whether it get m (the actual number of elements of sample for which is confirmed trend) in confidence limits:

$$\left(\bar{m} - t_\alpha \sqrt{\frac{\bar{m}(n - \bar{m})}{n}};\ \bar{m} + t_\alpha \sqrt{\frac{\bar{m}(n - \bar{m})}{n}} \right)$$

or no. I.e. for our task $\forall k = 1, 2, \ldots 5$ and all pairs $(i, j),\ i = 1, 2, \ldots N,\ j = 1, 2, \ldots N,\ i \le j$ we analyze the trueness of expression:

$$m_{kij} \in \left(\bar{m}_k - t_\alpha \sqrt{\frac{\bar{m}_k \left(n_{kij} - \bar{m}_k \right)}{n_{kij}}};\ \bar{m}_k + t_\alpha \sqrt{\frac{\bar{m}_k \left(n_{kij} - \bar{m}_k \right)}{n_{kij}}} \right),$$

where

$$n_{kij} = j - i + 1;$$

$$m_{kij} = \sum_{l=i}^{j} x_{kl};$$

$$\bar{m}_k = \sum_{l=1}^{N} x_{kl}.$$

If so, the deviation of the actual number of sample elements confirming the trend does not go beyond the statistical error;

otherwise, then is likely dependence of indicator from sample parameters, that is government tax behaviour of countries, that got to the sample, differs from generalized for all OECD countries.

So, not to confirm the independence hypothesis it is enough to find distribution, for which the number of economies in the sample, that follow a certain trend, falls outside the limits of a confidence interval for the independent hypothesis for the corresponding value of the quantile (usually, 0,95).

The cumulative hypothesis dependence test

Finding of a partition of the totality of world countries for which the number of countries at each of the efficiency levels that follow a given trend lies beyond the confidence interval, already suggests that government tax behaviour is not independent of the efficiency.

This can be considered a local task. However, it cannot be excluded the partition of a set is somewhat random and does not represent the overall trend.

For this reason, we are testing the independence of government tax behaviour from the efficiency of each indicator for all possible distributions of government tax behaviour (“increase tax rate”, “keep tax rate” and “decrease tax rate”) by factor efficiency levels (low, middle, high).

The presence of clusters of variants for which the independence of these factors is not confirmed improves the assurance of the hypothesis of dependence on these factors and shows the trend of government tax behaviour.

All countries in the world can be divided for each of the 5 efficiency indicators into 3 sets: countries with low, medium and high efficiency. It should be noted that there is no fixed distribution, it is only clear that the sequence of countries, ordered by some efficiency indicator, begins with low-efficiency countries, continues with middle-efficiency countries and ends with high-efficiency countries.

We assume if government tax behaviour of certain set of countries (with low, middle, or high efficiency of country's economy) dependents from efficiency the countries of this set generally choose 1 from 3 options: increasing, decreasing, or keeping tax rate. Here, by "generally choose" we mean that the number of countries of the set which chosen such behaviour, fall outside the limits of 95% confidence interval for a binomial distribution.

Let us set:

- ✓ countries with low economic efficiency – low;
- ✓ countries with middle economic efficiency – middle;
- ✓ countries with high economic efficiency – high;
- ✓ increase tax rate – increase;
- ✓ decrease tax rate – decrease;
- ✓ keep tax rate – keep.

3 efficiency levels and 3 variants of tax behaviour give 6 variants of total behaviour of all countries of a set:

- ✓ {low – increase, middle – keep, high – decrease};
- ✓ {low – increase, middle – decrease, high – keep};
- ✓ {low – keep, middle – increase, high – decrease};
- ✓ {low – keep, middle – decrease, high – increase};
- ✓ {low – decrease, middle – increase, high – keep};
- ✓ {low – decrease, middle – keep, high – increase}.

Since if countries are ordered by efficiency, first follow countries with low efficiency, then – with middle one, and finally – with high one, later we for the sake of reduction omit “low” on 1st position, ”middle” – on 2nd one, “high” – on 3rd one, and kind of a behaviour reduces to 4 first letters: “incr”, “keep”, and “decr”.

For each from 5 efficiency indicator, for each from 6 above variants, for all possible distributes of countries on low-, medium- and high-efficiency economies we are testing independence hypothesis of government tax behaviour from an efficiency of economy (i.e., we test, whether the number of countries that chosen such behaviour falls outside the limits of confidence interval or not).

Formally, we are testing the independence hypothesis for $\forall\left\{s^{e,b}_{n_l,n_m}\right\}$,

where

$$e \in \left\{GDP;\ FDI;\ GDP\ per\ capita;\ FDI\ per\ capita;\ \frac{FDI}{GDP}\right\};$$

$$b \in \begin{Bmatrix}(incr,keep,decr);\ (incr,decr,keep);\ (keep,incr,decr);\\ (keep,decr,incr);\ (decr,incr,keep);\ (decr,keep,incr)\end{Bmatrix};$$

$$\forall i, j, k: 1 \le i \le N-2;\ i+1 \le j \le N-1; j+1 \le k \le N:$$

$\{s_i : 1 \le i \le n_l\}$ – the set of low-efficiency countries;

$\{s_j : n_l + 1 \le j \le n_m\}$ – the set of middle-efficiency countries;

$\{s_k : n_m + 1 \le k \le N\}$ – the set of high-efficiency countries.

We fix the total non-confirmation of the independence hypothesis, if a large of each from 3 sets of countries fall outside the limits of confidence interval: low, middle, and high.

Results

The available statistics were considered regarding the above trends. I.e., we divided world countries and their data into three groups:

1) countries, which reduced the corporate tax burden during 2005-2017,
2) countries, which increased the corporate tax burden, and
3) countries having a CIT rate in 2017 equal to the level of 2005.

In addition, all countries were arranged by each of five indicators.

The obtained results are presented in the Tables A3-A7.

The indicators GDP, FDI, GDP per capita, FDI per capita, FDI/GDP in tables A3-A7 are ranked in ascending order.

From the Tables A3-A7 it can be seen that during 13 last years 69 countries have reduced the CIT rates (the 1st group), 39 countries have not made any changes (2nd group) and 16 countries have increased the rates (the 3rd group). For each of these groups, we statistically tested the hypotheses about the independence of selected efficiency indicators and the CIT rate. The essence of testing was as follows.

There were checked all possible combinations 3 above behavioural types and 3 world countries groups with different values of efficiency indicators: countries with high, middle (intermediate) and low efficiency.

We divided world countries into three groups according to values of their efficiency indicators: countries with high, middle (intermediate) and low efficiency.

In order to confirm assumption about the relationship between the trend of the change of the CIT rate and certain efficiency indicator, the number of economies in the corresponding groups should be in the 95% confidence interval.

The results are presented in Table 1.

I.e. that can select such distributions of world countries by efficiency and government tax behaviour that for all world countries almost all of the hypotheses for independence between the trend of changes of the CIT tax rates and values of efficiency indicators (14 of 15, 93,3%) will be rejected with 0,95 probability.

This shows that there is an interrelation between changes of the corporate tax burden and economic efficiency of countries according to all measurement methods.

Table no. 1 – The results of the statistical independence hypothesis test of changes CIT rate on indicators efficiency of economics

Indicator	**number of countries in the sample meets the criteria**	**C.I. (95%)**
The tax change	**increase**	
Number of countries meets the criteria: 14 of 114		
high GDP	4 of 21	[1,31; 3,84]
middle FDI	5 of 27	[1,69; 4,94]
high GDP per capita	7 of 31	[1,94; 5,68]
high FDI per capita	2 of 10	[0,63; 1,83]
high FDI/GDP	3 of 26	[1,62; 4,76]
The tax change	**keep**	
Number of countries meets the criteria: 38 of 114		
low GDP	19 of 35	[8,64; 14,70]
low FDI	20 of 38	[9,38; 15,95]
low GDP per capita	20 of 45	[11,11; 18,89]
middle FDI per capita	17 of 31	[7,65; 13,02]
middle FDI/GDP	14 of 30	[7,40; 12,60]
The tax change	**decrease**	
Number of countries meets the criteria: 62 of 114		
middle GDP	41 of 58	[26,24; 36,85]
high FDI	32 of 48	[21,72; 30,49]
middle GDP per capita	27 of 38	[17,19; 24,14]
low FDI per capita	47 of 73	[33,03; 46,38]
low FDI/GDP	35 of 58	[26,24; 36,85]

Source: author's calculations

The obtained conclusion provides an answer to one of the tasks of our study which concerns the implicit dependency between government tax behaviour and each of five indicators of the economic efficiency for world countries.

The total testing was done for 30 variants (5 efficiency indicators × 6 sequences of government tax behaviour).

Each variant contains $(N-2)(N-1)=122\cdot 123=15006$ possible combination of low-efficiency, middle-efficiency, and high-efficiency economies.

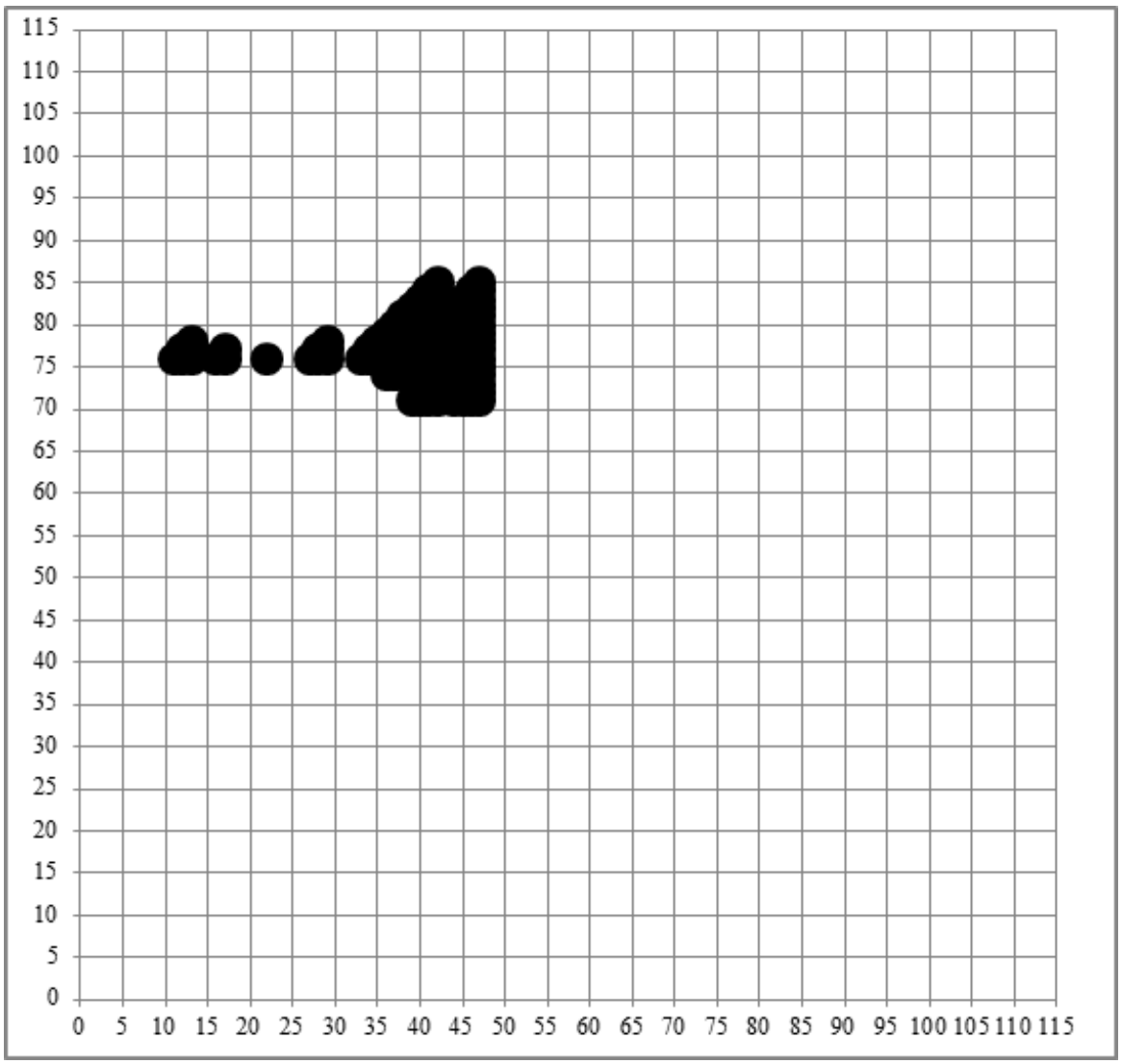
Table 2 shows for each option the number of cases of non-confirmation the independence hypothesis.

Table 2 – The number of non-confirmation the independence hypothesis for every efficiency indicators and total government tax behaviour

the economy's efficiency			GDP	FDI	GDP per capita	FDI per capita	$\frac{FDI}{GDP}$
low	middle	high					
increase	decrease	keep	59	47	0	42	0
increase	keep	decrease	0	0	0	0	0
decrease	increase	keep	337	604	152	14	0
decrease	keep	increase	0	0	0	0	0
keep	increase	decrease	0	0	0	0	0
keep	decrease	increase	0	0	0	0	0

Source: Authors' calculations

Fig. 2. Results of cumulative testing of the hypothesis of independence of government tax behaviour from GDP per capita for the case of total behaviour {low – keep, middle – decrease, high – increase}

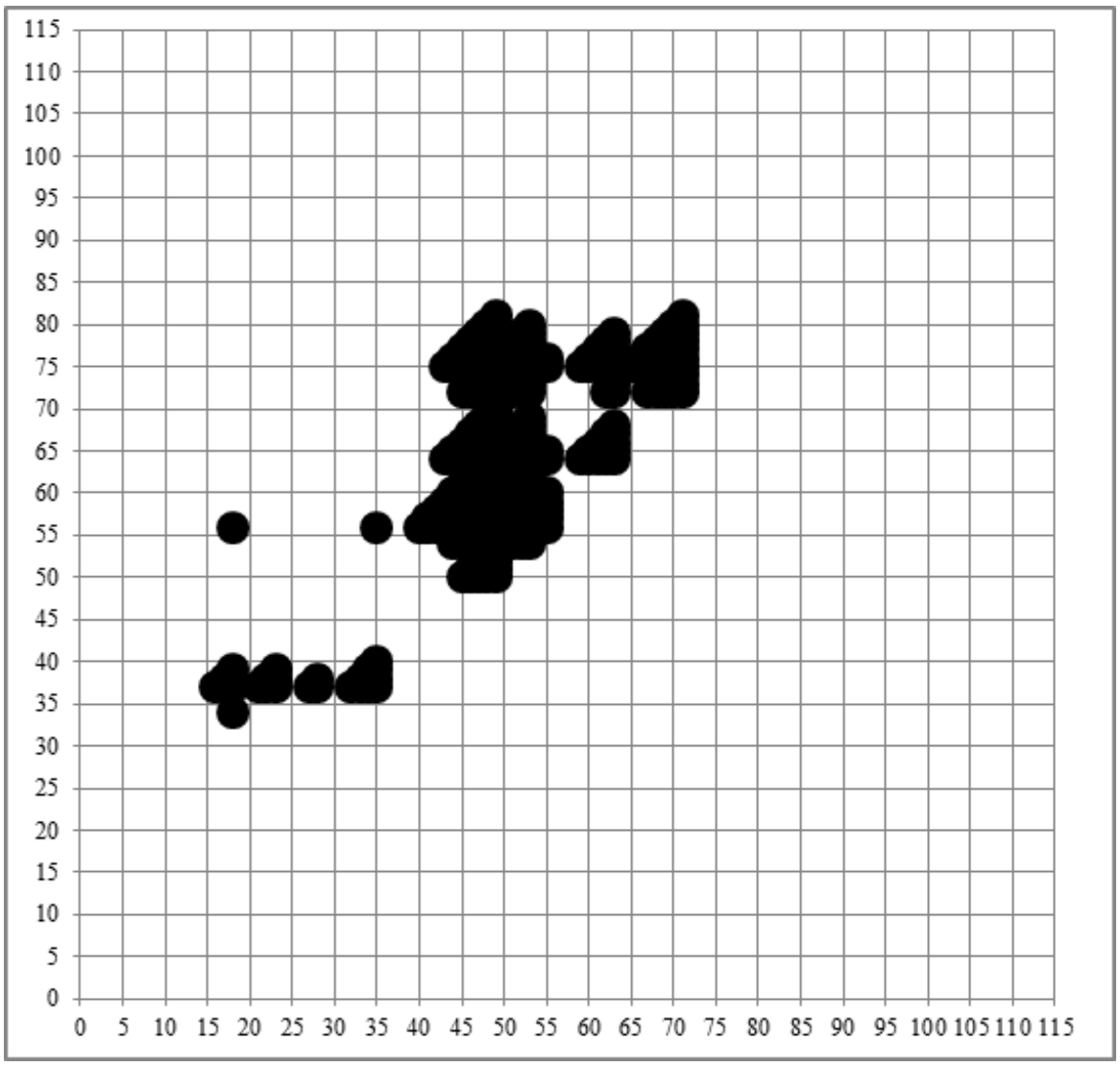


Source: Authors' calculations

axis of abscissas – the last number of low level

axis of ordinates – the last elements of middle level

Fig. 4. Results of cumulative testing of the hypothesis of independence of government tax behaviour from GDP for the case of total behaviour {low – keep, middle – decrease, high – increase}

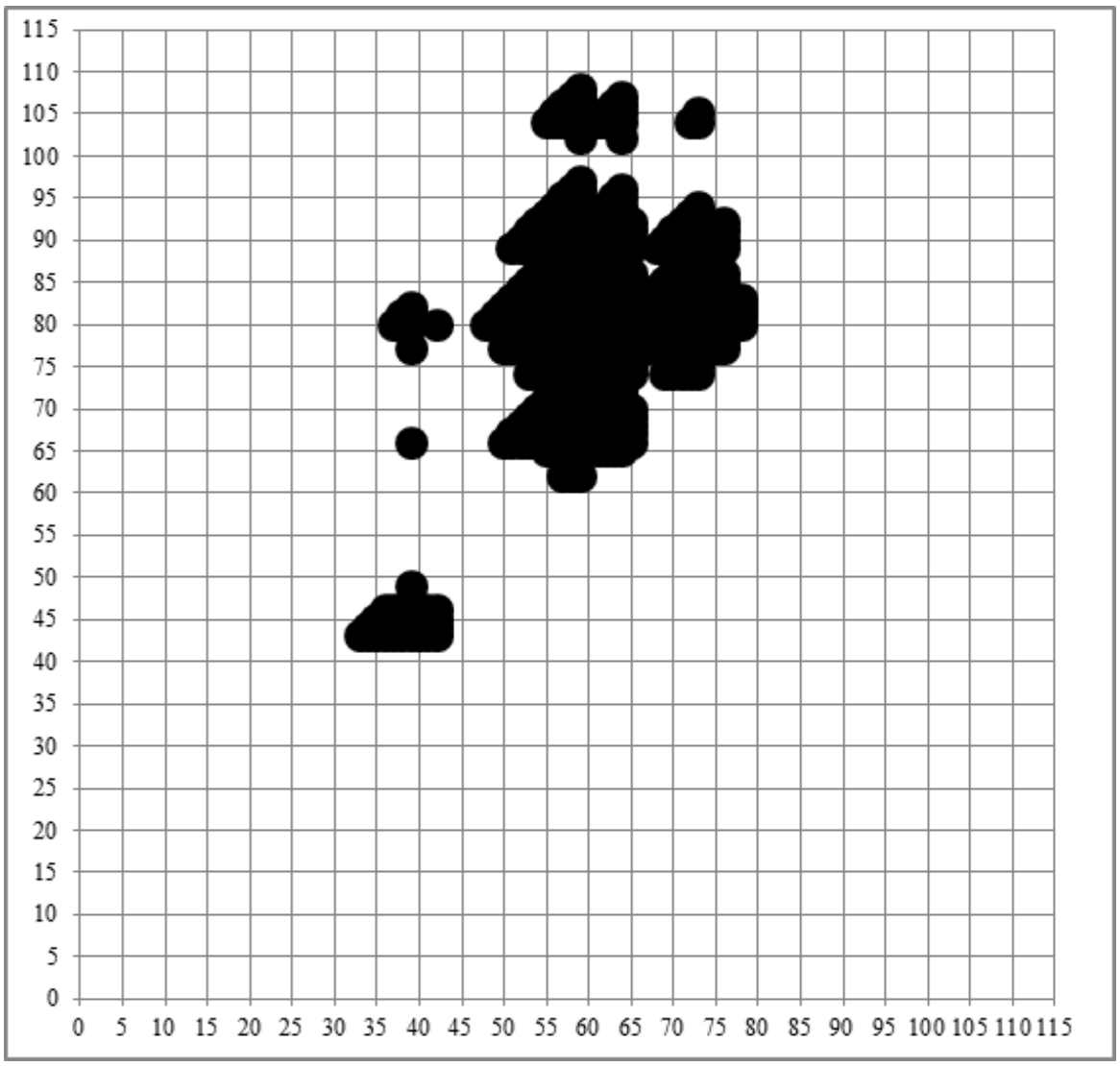


Source: Authors' calculations

axis of abscissas – the last number of low level

axis of ordinates – the last elements of middle level

Fig. 5. Results of cumulative testing of the hypothesis of independence of government tax behaviour from FDI for the case of total behaviour {low – keep, middle – decrease, high – increase}



Source: Authors' calculations

axis of abscissas – the last number of low level

axis of ordinates – the last elements of middle level

Discussion

Table no. 9 shows for the indicator FDI/GDP there is no total non-confirmation of the independence hypothesis for any of 6 variants. For each from other 4 indicators there are 7 total non-confirmations of the independence hypothesis, namely:

- ✓ {increase, keep, decrease} and {keep, increase, decrease} for GDP;
- ✓ {increase, keep, decrease} and {keep, increase, decrease} for FDI;
- ✓ {keep, increase, decrease} for GDP per capita;
- ✓ {increase, keep, decrease} and {keep, increase, decrease} for FDI per capita.

Such an availability of 7 options, each contains distributions for which the independence hypothesis is not confirmed, tends to think that for the 4 efficiency indicators there is interdependence between the corporate tax rate change and the country's economic indicators. This conclusion resolves one of the study issues: it is the unconditional dependence between government tax behaviour and each of the 4 indicators of the economy's efficiency of the world countries.

As can see from Table no. 9 and Fig. 2-4, there are three options with a large of independence hypothesis non-confirmations:

- ✓ {low – keep, middle – increase, high – decrease} for GDP;
- ✓ {low – keep, middle – increase, high – decrease} for FDI;
- ✓ {low – keep, middle – increase, high – decrease} for GDP per capita.

I.e., in each of these cases for each of 3 indicators: GDR per capita, GDR, and FDI, governments apply the same strategy, and so, low-efficient countries keep tax rates, middle-efficient countries increase tax rates, and high-efficient countries decrease tax rates for any of 3 efficient indicators: GDR per capita, GDR, and FDI.

Comparison of results of the analysis for of the totality of world countries with the similar analysis for OECD countries (Sokolovskyi, 2018) shows:

- ✓ the dependence of government tax behaviour on economy's efficiency holds in both cases;

- ✓ in both cases government tax behaviours is not like a maximizer behaviour;
- ✓ however, if OECD countries act like satisfiers: they care about improving the economic climate and/or the budget filling, if there are difficulties with these indexes,
- ✓ then the behaviour of world countries it cannot be considered the behaviour of a satisfier. But in any case, it is not a maximizer's behaviour.

This evidences the stability of the priorities of governments of world countries to choose tax behaviour: in each of the above 3 cases for any efficiency indicator, the same multi-strategy is used what clearly demonstrates the dependence of government behaviour on the efficiency of the country's economy. I.e., the economy's efficiency is the main factor in decision-making to decrease, increase, or keep the tax burden.

It is widely believed among economists are of the opinion that one of the means of improving the economic climate and attracting additional investment is to reduce the tax burden. From this point of view, the above government tax behaviour is not rational: taxes are reduced by countries that already have the highest FDI and highest GDP. Consequently, it should search for other factors that explain the trend of government tax behaviour.

Conclusion

1. In order to study government tax behaviour, the factors and conditions determining the decision-making, we analyzed its possible correlation with set of indicators of efficiency of economies, based on GDP and FDI, nominal and per capita, as well as the ratio of FDI to GDP.
2. There were used statistical analysis methods to found the statistical relationship between government behaviour and each of the selected indicators. For confirmation or rejection of the independence hypothesis was used binomial asymptotic confidence interval for the mean.
3. To get the aggregate view, it was testing the independence hypothesis for each indicator of efficiency, for all possible distributes on low-, medium- and high-

efficiency economies, and for all possible options of application of tax behaviour strategies by indicated economic groups.

4. The analysis allowed us to divide the all countries of world into three groups according their tax behaviour: that increase their CIT tax burden, that reduce it and that does not use the tax instruments, notably, in order to attract the foreign investors.
5. It found the correlation between the government's tax behaviour (defined as the difference between corporate tax burden at the beginning and the end of period) and each of selected indicators.
6. It is found, government's tax behaviour depends the most systemically on the indicators as GDP per capita, GDP and FDI, and in all of these cases, the same statistically confirmed trend is observed (invariance of CIT tax rate for the least efficient economies, increase CIT tax rate for economies with average efficiency and decrease CIT tax rate for the most efficient economies).
7. This evidences the stability of the priorities of governments of world countries to choose tax behaviour. The main factor in deciding whether to decrease, increase or keep the tax burden is the economy's efficiency.
8. However, in general there is a trend related to the reduction of the tax burden, which can be considered not only as intention to attract the new investment, but also as the fight for investors. Under specific conditions such fight could lead to a "race to the bottom" situation, i.e. to the inefficient state of all economic systems participated in this race. Thus, determining the reasons, factors and conditions favoring the race to the bottom between different countries require the further investigation.

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Appendix

Table A1. CIT rates in world countries, 2005-2017 yr.

Country	2005 yr.	2017 yr.	Changes of CIT rates, (2017 – 2005), yrs.
Afghanistan	0	0,2	0,2
Albania	0,2	0,15	–0,05
Algeria	0,25	0,26	0,01
Angola	0,35	0,3	–0,05
Argentina	0,35	0,3	–0,05
Armenia	0,2	0,2	0
Australia	0,3	0,3	0
Austria	0,25	0,25	0
Bahamas, The	0	0	0
Bahrain	0	0	0
Bangladesh	0,3	0,25	–0,05
Barbados	0,25	0,3	0,05
Belarus	0,24	0,18	–0,06
Belgium	0,3399	0,29	–0,05
Bolivia	0,25	0,25	0
Bosnia and Herzegovina	0,1	0,1	0
Botswana	0,25	0,22	–0,03
Brazil	0,34	0,34	0
Bulgaria	0,15	0,1	–0,05
Cambodia	0,2	0,2	0
Canada	0,361	0,265	–0,096
Chile	0,17	0,26	0,09
China	0,33	0,25	–0,08
Colombia	0,35	0,33	–0,02
Costa Rica	0,3	0,3	0
Croatia	0,2	0,18	–0,02
Czech Republic	0,24	0,19	–0,05
Denmark	0,28	0,22	–0,06
Dominican Republic	0,3	0,27	–0,03
Ecuador	0,25	0,25	0
Egypt, Arab Rep.	0,2	0,23	0,03
El Salvador	0,3	0,3	0
Estonia	0,23	0,2	–0,03
Finland	0,26	0,2	–0,06
France	0,3333	0,33	–0,003
Georgia	0,15	0,15	0
Germany	0,3834	0,3	–0,083

Continue of Table A1

Country	2005 yr.	2017 yr.	Changes of CIT rates, (2017 – 2005), yrs.
Ghana	0,25	0,25	0
Greece	0,29	0,29	0
Honduras	0,3	0,25	–0,05
Hong Kong SAR, China	0,175	0,165	–0,01
Hungary	0,16	0,09	–0,07
Iceland	0,18	0,2	0,02
India	0,3366	0,35	0,0134
Indonesia	0,3	0,25	–0,05
Ireland	0,125	0,125	0
Israel	0,31	0,23	–0,08
Italy	0,3725	0,24	–0,133
Jamaica	0,3333	0,25	–0,083
Japan	0,4069	0,3086	–0,098
Jordan	0,25	0,2	–0,05
Kazakhstan	0,3	0,2	–0,1
Kenya	0,3	0,3	0
Korea, Rep.	0,275	0,25	–0,025
Kuwait	0,55	0,15	–0,4
Latvia	0,15	0,2	0,05
Lebanon	0,15	0,15	0
Lithuania	0,15	0,15	0
Luxembourg	0,2963	0,2601	–0,036
Macao SAR, China	0,12	0,12	0
Macedonia, FYR	0,15	0,1	–0,05
Malawi	0,3	0,3	0
Malaysia	0,28	0,24	–0,04
Malta	0,35	0,35	0
Mauritius	0,25	0,15	–0,1
Mexico	0,29	0,3	0,01
Montenegro	0,09	0,09	0
Morocco	0,3	0,31	0,01
Mozambique	0,32	0,32	0
Namibia	0,34	0,32	–0,02
Netherlands	0,296	0,25	–0,046
New Zealand	0,33	0,28	–0,05
Nigeria	0,3	0,3	0
Norway	0,28	0,23	–0,05
Oman	0,12	0,15	0,03
Pakistan	0,35	0,3	–0,05

Continue of Table A1

Country	2005 yr.	2017 yr.	Changes of CIT rates, (2017 – 2005), yrs.
Panama	0,3	0,25	–0,05
Paraguay	0,1	0,1	0
Peru	0,3	0,295	–0,005
Philippines	0,35	0,3	–0,05
Poland	0,19	0,19	0
Portugal	0,275	0,21	–0,065
Qatar	0,35	0,1	–0,25
Romania	0,16	0,16	0
Russian Federation	0,24	0,2	–0,04
Saudi Arabia	0,2	0,2	0
Serbia	0,1	0,15	0,05
Sierra Leone	0,3	0,3	0
Singapore	0,2	0,17	–0,03
Slovak Republic	0,19	0,21	0,02
Slovenia	0,25	0,19	–0,06
South Africa	0,3689	0,28	–0,089
Spain	0,35	0,25	–0,1
Sri Lanka	0,325	0,28	–0,045
Sudan	0,35	0,35	0
Suriname	0,36	0,36	0
Sweden	0,28	0,22	–0,06
Switzerland	0,213	0,18	–0,033
Tanzania	0,3	0,3	0
Thailand	0,3	0,2	–0,1
Trinidad and Tobago	0,25	0,25	0
Tunisia	0,35	0,25	–0,1
Turkey	0,2	0,22	0,02
Uganda	0,3	0,3	0
Ukraine	0,25	0,18	–0,07
United Arab Emirates	0,55	0,55	0
United Kingdom	0,3	0,19	–0,11
United States	0,4	0,27	–0,13
Uruguay	0,3	0,25	–0,05
Vanuatu	0	0	0
Vietnam	0,28	0,2	–0,08
Yemen, Rep.	0,35	0,2	–0,15
Zambia	0,35	0,35	0
Zimbabwe	0,309	0,25	–0,059

Source: (Corporate tax rates table, 2018); authors' calculations

Table A2. Based macro-economic factors in world countries, 2017 yr., $bn

Country	GDP	FDI	GDP per capita	FDI per capita	$\frac{FDI}{GDP}$
Afghanistan	19544	53	550,068	1,503	0,003
Albania	13039	1022	4537,579	355,715	0,078
Algeria	167555	1201	4055,247	29,066	0,007
Angola	122124	–7397	4100,290	–248,363	–0,061
Argentina	637430	11517	14398,359	260,144	0,018
Armenia	11537	250	3936,798	85,229	0,022
Australia	1323421	42580	53799,938	1730,958	0,032
Austria	416596	15608	47290,912	1771,783	0,037
Bahamas, The	12162	595	30762,012	1504,940	0,049
Bahrain	35307	519	23655,036	347,641	0,015
Bangladesh	249724	2151	1516,513	13,065	0,009
Barbados	4674	286	16356,980	1001,534	0,061
Belarus	54456	1276	5727,512	134,236	0,023
Belgium	492681	–39482	43323,807	–3471,865	–0,080
Bolivia	37509	725	3393,956	65,570	0,019
Bosnia and Herzegovina	18055	463	5148,209	131,945	0,026
Botswana	17407	401	7595,611	174,795	0,023
Brazil	2055506	70685	9821,408	337,740	0,034
Bulgaria	58221	2182	8227,960	308,384	0,037
Cambodia	22158	2788	1384,423	174,197	0,126
Canada	1653043	27526	45032,120	749,852	0,017
Chile	277076	6419	15346,450	355,507	0,023
China	12237700	168224	8826,994	121,339	0,014
Colombia	314458	14013	6408,920	285,605	0,045
Costa Rica	57286	2856	11677,269	582,173	0,050
Croatia	55213	2040	13382,720	494,573	0,037
Czech Republic	215726	9210	20368,139	869,587	0,043
Denmark	324872	2357	56307,508	408,585	0,007
Dominican Republic	75932	3597	7052,259	334,095	0,047
Ecuador	104296	618	6273,489	37,199	0,006
Egypt, Arab Rep.	235369	7392	2412,727	75,771	0,031
El Salvador	24805	331	3889,309	51,885	0,013
Estonia	25921	1555	19704,655	1182,220	0,060
Finland	251885	14198	45703,328	2576,145	0,056
France	2582501	47336	38476,659	705,253	0,018
Georgia	15081	1830	4057,286	492,301	0,121
Germany	3677439	77983	44469,909	943,024	0,021
Ghana	58997	3255	2046,110	112,889	0,055

Continue of Table A2

Country	GDP	FDI	GDP per capita	FDI per capita	$\frac{FDI}{GDP}$
Greece	200288	3571	18613,424	331,889	0,018
Honduras	22979	1265	2480,126	136,489	0,055
Hong Kong SAR, China	341449	122401	46193,615	16559,257	0,358
Hungary	139135	–13484	14224,846	–1378,526	–0,097
Iceland	23909	–7017	70056,873	–20560,252	–0,293
India	2600818	39966	1942,097	29,844	0,015
Indonesia	1015539	21465	3846,864	81,308	0,021
Ireland	333731	–3436	69330,690	–713,806	–0,010
Israel	350851	18169	40270,251	2085,407	0,052
Italy	1934798	9235	31952,976	152,518	0,005
Jamaica	14781	886	5114,041	306,449	0,060
Japan	4872137	18838	38428,097	148,578	0,004
Jordan	40068	2030	4129,752	209,199	0,051
Kazakhstan	162887	4654	9030,384	258,028	0,029
Kenya	79263	671	1594,835	13,511	0,008
Korea, Rep.	1530751	17053	29742,839	331,340	0,011
Kuwait	120126	113	29040,364	27,321	0,001
Latvia	30264	1138	15594,286	586,204	0,038
Lebanon	53577	2559	8808,589	420,681	0,048
Lithuania	47168	1191	16680,678	421,055	0,025
Luxembourg	62404	6623	104103,037	11048,041	0,106
Macao SAR, China	50361	–1642	80892,821	–2636,900	–0,033
Macedonia, FYR	11280	381	5414,615	182,770	0,034
Malawi	6303	277	338,484	14,881	0,044
Malaysia	314710	9512	9951,544	300,772	0,030
Malta	12518	3462	26903,825	7439,977	0,277
Mauritius	13266	293	10490,504	231,415	0,022
Mexico	1150888	32127	8910,333	248,731	0,028
Montenegro	4845	560	7782,840	900,107	0,116
Morocco	109709	2680	3007,243	73,465	0,024
Mozambique	12646	2319	426,222	78,165	0,183
Namibia	13254	591	5230,772	233,151	0,045
Netherlands	826200	316541	48223,155	18475,698	0,383
New Zealand	205853	2144	42940,578	447,332	0,010
Nigeria	375745	3497	1968,426	18,321	0,009
Norway	398832	1643	75504,566	310,956	0,004
Oman	72643	2918	15668,367	629,403	0,040
Pakistan	304952	2815	1547,853	14,288	0,009

Continue of Table A2

Country	GDP	FDI	GDP per capita	FDI per capita	$\frac{FDI}{GDP}$
Panama	62284	4826	15196,397	1177,577	0,077
Paraguay	39667	507	5823,766	74,438	0,013
Peru	211389	6769	6571,929	210,458	0,032
Philippines	313595	10057	2988,953	95,859	0,032
Poland	526466	10673	13863,178	281,047	0,020
Portugal	217571	10023	21136,297	973,697	0,046
Qatar	166929	986	63249,422	373,592	0,006
Romania	211884	5953	10817,834	303,929	0,028
Russian Federation	1577524	28557	10743,097	194,479	0,018
Saudi Arabia	686738	1421	20849,291	43,150	0,002
Serbia	41432	2879	5900,038	409,956	0,069
Sierra Leone	3775	560	499,529	74,101	0,148
Singapore	323907	63633	57714,297	11338,305	0,196
Slovak Republic	95769	5922	17604,951	1088,556	0,062
Slovenia	48770	1082	23597,292	523,469	0,022
South Africa	348872	1372	6151,078	24,189	0,004
Spain	1311320	6204	28156,816	133,207	0,005
Sri Lanka	87357	1375	4073,737	64,116	0,016
Sudan	117488	1065	2898,549	26,282	0,009
Suriname	2996	159	5317,390	281,763	0,053
Sweden	538040	31531	53442,008	3131,867	0,059
Switzerland	678887	37864	80189,697	4472,459	0,056
Tanzania	52090	1180	936,331	21,214	0,023
Thailand	455303	8046	6595,004	116,538	0,018
Trinidad and Tobago	22079	–422	16126,371	–308,511	–0,019
Tunisia	39952	810	3464,417	70,212	0,020
Turkey	851549	10886	10546,153	134,819	0,013
Uganda	25995	699	606,468	16,319	0,027
Ukraine	112154	2827	2639,824	66,540	0,025
United Arab Emirates	382575	10354	40698,849	1101,496	0,027
United Kingdom	2622434	64685	39720,443	979,751	0,025
United States	19390604	354828	59531,662	1089,368	0,018
Uruguay	56157	–878	16245,598	–254,087	–0,016
Vanuatu	863	25	3123,615	89,430	0,029
Vietnam	223780	14100	2342,244	147,581	0,063
Yemen, Rep.	31268	–270	1106,804	–9,552	–0,009
Zambia	25868	866	1513,276	50,655	0,033
Zimbabwe	22041	247	1333,396	14,954	0,011

Source: (World Development Indicators, 2018); authors' calculations

Table A3. Ratios of the GDP indicators to the change of CIT rates in world countries (in the order of increasing of GDP), $bn

GDP, 2017 yr.	Change of CIT rate (2017 – 2005, yrs.)	GDP, 2017 yr.	Change of CIT rate (2017 – 2005, yrs.)	GDP, 2017 yr.	Change of CIT rate (2017 – 2005, yrs.)
863	0,000	50361	0,000	313595	–0,050
2996	0,000	52090	0,000	314458	–0,020
3775	0,000	53577	0,000	314710	–0,040
4674	0,050	54456	–0,060	323907	–0,030
4845	0,000	55213	–0,020	324872	–0,060
6303	0,000	56157	–0,050	333731	0,000
11280	–0,050	57286	0,000	341449	–0,010
11537	0,000	58221	–0,050	348872	–0,089
12162	0,000	58997	0,000	350851	–0,080
12518	0,000	62284	–0,050	375745	0,000
12646	0,000	62404	–0,036	382575	0,000
13039	–0,050	72643	0,030	398832	–0,050
13254	–0,020	75932	–0,030	416596	0,000
13266	–0,100	79263	0,000	455303	–0,100
14781	–0,083	87357	–0,045	492681	–0,050
15081	0,000	95769	0,020	526466	0,000
17407	–0,030	104296	0,000	538040	–0,060
18055	0,000	109709	0,010	637430	–0,050
19544	0,200	112154	–0,070	678887	–0,033
22041	–0,059	117488	0,000	686738	0,000
22079	0,000	120126	–0,400	826200	–0,046
22158	0,000	122124	–0,050	851549	0,020
22979	–0,050	139135	–0,070	1015539	–0,050
23909	0,020	162887	–0,100	1150888	0,010
24805	0,000	166929	–0,250	1311320	–0,100
25868	0,000	167555	0,010	1323421	0,000
25921	–0,030	200288	0,000	1530751	–0,025
25995	0,000	205853	–0,050	1577524	–0,040
30264	0,050	211389	–0,005	1653043	–0,096
31268	–0,150	211884	0,000	1934798	–0,133
35307	0,000	215726	–0,050	2055506	0,000
37509	0,000	217571	–0,065	2582501	–0,003
39667	0,000	223780	–0,080	2600818	0,013
39952	–0,100	235369	0,030	2622434	–0,110
40068	–0,050	249724	–0,050	3677439	–0,083
41432	0,050	251885	–0,060	4872137	–0,098
47168	0,000	277076	0,090	12237700	–0,080
48770	–0,060	304952	–0,050	19390604	–0,130

Source: authors' calculations

Table A4. Ratios of the GDP per capita indicators to the change of CIT rates in world countries (in the order of increasing of GDP per capita), $

GDP per capita, 2017 yr.	Change of CIT rate (2017 – 2005, yrs.)	GDP per capita, 2017 yr.	Change of CIT rate (2017 – 2005, yrs.)	GDP per capita, 2017 yr.	Change of CIT rate (2017 – 2005, yrs.)
338,484	0,000	5317,390	0,000	18613,424	0,000
426,222	0,000	5414,615	–0,050	19704,655	–0,030
499,529	0,000	5727,512	–0,060	20368,139	–0,050
550,068	0,200	5823,766	0,000	20849,291	0,000
606,468	0,000	5900,038	0,050	21136,297	–0,065
936,331	0,000	6151,078	–0,089	23597,292	–0,060
1106,804	–0,150	6273,489	0,000	23655,036	0,000
1333,396	–0,059	6408,920	–0,020	26903,825	0,000
1384,423	0,000	6571,929	–0,005	28156,816	–0,100
1513,276	0,000	6595,004	–0,100	29040,364	–0,400
1516,513	–0,050	7052,259	–0,030	29742,839	–0,025
1547,853	–0,050	7595,611	–0,030	30762,012	0,000
1594,835	0,000	7782,840	0,000	31952,976	–0,133
1942,097	0,013	8227,960	–0,050	38428,097	–0,098
1968,426	0,000	8808,589	0,000	38476,659	–0,003
2046,110	0,000	8826,994	–0,080	39720,443	–0,110
2342,244	–0,080	8910,333	0,010	40270,251	–0,080
2412,727	0,030	9030,384	–0,100	40698,849	0,000
2480,126	–0,050	9821,408	0,000	42940,578	–0,050
2639,824	–0,070	9951,544	–0,040	43323,807	–0,050
2898,549	0,000	10490,504	–0,100	44469,909	–0,083
2988,953	–0,050	10546,153	0,020	45032,120	–0,096
3007,243	0,010	10743,097	–0,040	45703,328	–0,060
3123,615	0,000	10817,834	0,000	46193,615	–0,010
3393,956	0,000	11677,269	0,000	47290,912	0,000
3464,417	–0,100	13382,720	–0,020	48223,155	–0,046
3846,864	–0,050	13863,178	0,000	53442,008	–0,060
3889,309	0,000	14224,846	–0,070	53799,938	0,000
3936,798	0,000	14398,359	–0,050	56307,508	–0,060
4055,247	0,010	15196,397	–0,050	57714,297	–0,030
4057,286	0,000	15346,450	0,090	59531,662	–0,130
4073,737	–0,045	15594,286	0,050	63249,422	–0,250
4100,290	–0,050	15668,367	0,030	69330,690	0,000
4129,752	–0,050	16126,371	0,000	70056,873	0,020
4537,579	–0,050	16245,598	–0,050	75504,566	–0,050
5114,041	–0,083	16356,980	0,050	80189,697	–0,033
5148,209	0,000	16680,678	0,000	80892,821	0,000
5230,772	–0,020	17604,951	0,020	104103,037	–0,036

Source: authors' calculations

Table A5. Ratios of the FDI indicators to the change of CIT rates in world countries (in the order of increasing of FDI), $bn

FDI, 2017 yr	Change of CIT rate (2017 – 2005, yrs.)	FDI, 2017 yr	Change of CIT rate (2017 – 2005, yrs.)	FDI, 2017 yr	Change of CIT rate (2017 – 2005, yrs.)
–39482	–0,050	1082	–0,060	6419	0,090
–13484	–0,070	1180	0,000	6623	–0,036
–7397	–0,050	1191	0,000	7392	0,030
–7017	0,020	1201	0,010	8046	–0,100
–3436	0,000	1265	–0,050	9210	–0,050
–1642	0,000	1276	–0,060	9235	–0,133
–878	–0,050	1372	–0,089	9512	–0,040
–422	0,000	1375	–0,045	10023	–0,065
–270	–0,150	1421	0,000	10057	–0,050
25	0,000	1555	–0,030	10354	0,000
53	0,200	1643	–0,050	10673	0,000
113	–0,400	1830	0,000	10886	0,020
159	0,000	2030	–0,050	11517	–0,050
247	–0,059	2040	–0,020	14013	–0,020
250	0,000	2144	–0,050	14100	–0,080
277	0,000	2151	–0,050	14198	–0,060
286	0,050	2182	–0,050	15608	0,000
293	–0,100	2319	0,000	17053	–0,025
331	0,000	2357	–0,060	18169	–0,080
381	–0,050	2559	0,000	18838	–0,098
401	–0,030	2680	0,010	21465	–0,050
463	0,000	2788	0,000	27526	–0,096
507	0,000	2815	–0,050	28557	–0,040
519	0,000	2827	–0,070	31531	–0,060
560	0,000	2856	0,000	32127	0,010
591	–0,020	2879	0,050	37864	–0,033
595	0,000	2918	0,030	39966	0,013
618	0,000	3255	0,000	42580	0,000
671	0,000	3462	0,000	47336	–0,003
699	0,000	3497	0,000	63633	–0,030
725	0,000	3571	0,000	64685	–0,110
810	–0,100	3597	–0,030	70685	0,000
866	0,000	4654	–0,100	77983	–0,083
886	–0,083	4826	–0,050	122401	–0,010
986	–0,250	5922	0,020	168224	–0,080
1022	–0,050	5953	0,000	316541	–0,046
1065	0,000	6204	–0,100	354828	–0,130

Source: authors' calculations

Table A6. Ratios of the FDI per capita indicators to the change of CIT rates in world countries (in the order of increasing of FDI per capita), $

FDI per capita, 2017 yr.	Change of CIT rate (2017 – 2005, yrs.)	FDI per capita, 2017 yr.	Change of CIT rate (2017 – 2005, yrs.)	FDI per capita, 2017 yr.	Change of CIT rate (2017 – 2005, yrs.)
–20560,252	0,020	89,430	0,000	355,715	–0,050
–3471,865	–0,050	95,859	–0,050	373,592	–0,250
–2636,900	0,000	112,889	0,000	408,585	–0,060
–1378,526	–0,070	116,538	–0,100	409,956	0,050
–713,806	0,000	121,339	–0,080	420,681	0,000
–308,511	0,000	131,945	0,000	421,055	0,000
–254,087	–0,050	133,207	–0,100	447,332	–0,050
–248,363	–0,050	134,236	–0,060	492,301	0,000
–9,552	–0,150	134,819	0,020	494,573	–0,020
1,503	0,200	136,489	–0,050	523,469	–0,060
13,065	–0,050	147,581	–0,080	582,173	0,000
13,511	0,000	148,578	–0,098	586,204	0,050
14,288	–0,050	152,518	–0,133	629,403	0,030
14,881	0,000	174,197	0,000	705,253	–0,003
14,954	–0,059	174,795	–0,030	749,852	–0,096
16,319	0,000	182,770	–0,050	869,587	–0,050
18,321	0,000	194,479	–0,040	900,107	0,000
21,214	0,000	209,199	–0,050	943,024	–0,083
24,189	–0,089	210,458	–0,005	973,697	–0,065
26,282	0,000	231,415	–0,100	979,751	–0,110
27,321	–0,400	233,151	–0,020	1001,534	0,050
29,066	0,010	248,731	0,010	1088,556	0,020
29,844	0,013	258,028	–0,100	1089,368	–0,130
37,199	0,000	260,144	–0,050	1101,496	0,000
43,150	0,000	281,047	0,000	1177,577	–0,050
50,655	0,000	281,763	0,000	1182,220	–0,030
51,885	0,000	285,605	–0,020	1504,940	0,000
64,116	–0,045	300,772	–0,040	1730,958	0,000
65,570	0,000	303,929	0,000	1771,783	0,000
66,540	–0,070	306,449	–0,083	2085,407	–0,080
70,212	–0,100	308,384	–0,050	2576,145	–0,060
73,465	0,010	310,956	–0,050	3131,867	–0,060
74,101	0,000	331,340	–0,025	4472,459	–0,033
74,438	0,000	331,889	0,000	7439,977	0,000
75,771	0,030	334,095	–0,030	11048,041	–0,036
78,165	0,000	337,740	0,000	11338,305	–0,030
81,308	–0,050	347,641	0,000	16559,257	–0,010
85,229	0,000	355,507	0,090	18475,698	–0,046

Source: authors' calculations

Table. A7. Ratios of the FDI/GDP indicators to the change of CIT rates in world countries (in the order of increasing of FDI/GDP)

FDI/GDP, 2017 yr.	Change of CIT rate (2017 – 2005, yrs.)	FDI/GDP, 2017 yr.	Change of CIT rate (2017 – 2005, yrs.)	FDI/GDP, 2017 yr.	Change of CIT rate (2017 – 2005, yrs.)
–0,2935	0,020	0,0178	0,000	0,0375	–0,050
–0,0969	–0,070	0,0181	–0,050	0,0376	0,050
–0,0801	–0,050	0,0181	–0,040	0,0402	0,030
–0,0606	–0,050	0,0183	–0,130	0,0427	–0,050
–0,0326	0,000	0,0183	–0,003	0,0440	0,000
–0,0191	0,000	0,0193	0,000	0,0446	–0,020
–0,0156	–0,050	0,0203	–0,100	0,0446	–0,020
–0,0103	0,000	0,0203	0,000	0,0461	–0,065
–0,0086	–0,150	0,0211	–0,050	0,0474	–0,030
0,0009	–0,400	0,0212	–0,083	0,0478	0,000
0,0021	0,000	0,0216	0,000	0,0489	0,000
0,0027	0,200	0,0221	–0,100	0,0499	0,000
0,0039	–0,098	0,0222	–0,060	0,0507	–0,050
0,0039	–0,089	0,0227	0,000	0,0518	–0,080
0,0041	–0,050	0,0230	–0,030	0,0530	0,000
0,0047	–0,100	0,0232	0,090	0,0550	–0,050
0,0048	–0,133	0,0234	–0,060	0,0552	0,000
0,0059	–0,250	0,0244	0,010	0,0558	–0,033
0,0059	0,000	0,0247	–0,110	0,0564	–0,060
0,0072	0,010	0,0252	–0,070	0,0586	–0,060
0,0073	–0,060	0,0252	0,000	0,0599	–0,083
0,0085	0,000	0,0256	0,000	0,0600	–0,030
0,0086	–0,050	0,0269	0,000	0,0612	0,050
0,0091	0,000	0,0271	0,000	0,0618	0,020
0,0092	–0,050	0,0279	0,010	0,0630	–0,080
0,0093	0,000	0,0281	0,000	0,0695	0,050
0,0104	–0,050	0,0286	–0,100	0,0775	–0,050
0,0111	–0,025	0,0286	0,000	0,0784	–0,050
0,0112	–0,059	0,0302	–0,040	0,1061	–0,036
0,0128	0,000	0,0314	0,030	0,1157	0,000
0,0128	0,020	0,0320	–0,005	0,1213	0,000
0,0133	0,000	0,0321	–0,050	0,1258	0,000
0,0137	–0,080	0,0322	0,000	0,1483	0,000
0,0147	0,000	0,0335	0,000	0,1834	0,000
0,0154	0,013	0,0338	–0,050	0,1965	–0,030
0,0157	–0,045	0,0344	0,000	0,2765	0,000
0,0167	–0,096	0,0370	–0,020	0,3585	–0,010
0,0177	–0,100	0,0375	0,000	0,3831	–0,046

Source: authors' calculations